The Administrator of the Federal Aviation Administration (FAA) signed this final rule on July 18, 2025, and FAA submitted it for publication in the *Federal Register*. This is not the official version as the Office of the Federal Register may have edits as part of its publication process. Please refer to the official version in a forthcoming *Federal Register* publication, which will appear on the *Federal Register* website, https://www.federalregister.gov/.

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DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Parts 1, 21, 22, 36, 43, 45, 61, 65, 91, 119, and 147

[Docket No. FAA-2023-1377; Amdt. Nos. 1-80, 21-109, 22-1, 36-55, 43-63, 45-32, 61-159, 65-66, 91-381, 119-22, and 147-10]

RIN 2120-AL50

Modernization of Special Airworthiness Certification

AGENCY: Federal Aviation Administration (FAA), Department of Transportation (DOT).

ACTION: Final rule.

SUMMARY: FAA is amending rules for the manufacture, certification, operation, maintenance, and alteration of light-sport aircraft. The amendments enable enhancements in safety and performance and increase privileges under a number of sport pilot and light-sport aircraft rules. These enhancements include increasing suitability for flight training, limited aerial work, and personal travel. This final rule expands what aircraft sport pilots may operate. This final rule also amends the special purpose operations for restricted category aircraft; amends the duration, eligible purposes, and operating limitations for experimental aircraft; and adds operating limitations applicable to experimental aircraft engaged in space support vehicle flights to codify statutory language.

DATES: This final rule is effective [INSERT DATE 90 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER], except for amendatory instructions 3, 8, 9, 13, 15, 17, 21, 23 through 26, 71, 72, 75, 76, and 80, which are effective [INSERT DATE 365 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

The incorporation by reference of certain material listed in this final rule is approved by the Director of the Federal Register as of [INSERT DATE 90 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

ADDRESSES: For information on where to obtain copies of rulemaking documents and other information related to this final rule, see section VII of this document.

FOR FURTHER INFORMATION CONTACT: For technical questions concerning this action, contact James Newberger, Aircraft Certification Service (AIR-632), Federal Aviation Administration, 800 Independence Ave S.W., Washington, D.C. 20591, telephone (202) 267-1636; email james.e.newberger@faa.gov.

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List of Acronyms Frequently Used in This Document

ACS - Airman Certification Standards

AGL - Above Ground Level

ASTM - American Society for Testing and Material International

CAS - Calibrated Airspeed

CFR - Code of Federal Regulations

DOD - Department of Defense

EAB - Experimental Amateur-Built

eVTOL - Electric Vertical Takeoff and Landing

FAA - Federal Aviation Administration

FADEC - Full Authority Digital Electric Control

FR - Federal Register

FSTD - Flight Simulation Training Device

GA - General Aviation

IBR - Incorporation by Reference

IFR - Instrument Flight Rules

IMC - Instrument Meteorological Conditions

LOC-I - Loss of Control - In-flight

LSA - Light-Sport Aircraft

LSAMA - Light-Sport Aircraft Manufacturers Assessment

MOSAIC - Modernization of Special Airworthiness Certification

MSL - Mean Sea Level

NAICS - North American Industry Classification System

NPRM - Notice of Proposed Rulemaking

NTSB - National Transportation Safety Board

OMB - Office of Management and Budget

PIC - Pilot in Command

PTS - Practical Test Standards

RFA - Regulatory Flexibility Act

RIA - Regulatory Impact Analysis

U.S.C. - United States Code

V_A - Design maneuvering speed

VFR - Visual Flight Rules

V_H - Maximum speed in level flight with maximum continuous power

V_{NE} - Maximum never exceed speed

V_{S1} - The stalling speed or the minimum steady flight speed obtained in a specific configuration

V_{S0} - The stalling speed or the minimum steady flight speed in the landing configuration

I. Executive Summary

A. Purpose of the Regulatory Action

This final rule establishes requirements for aircraft, other than unmanned aircraft, that hold special airworthiness certificates, airmen that operate and maintain those aircraft, and supporting rules. This rule expands eligibility for certification of light-sport category aircraft while retaining a distinction in level of certification rigor between experimental and small, type-certificated aircraft. This rule also expands privileges for sport pilots and light-sport repairmen. This rule aims to increase the availability of safe, modern, and affordable aircraft for recreational aviation, flight training, and certain aerial work.

Generally, this rule provides broad regulatory relief to the public. That is, under this rule, manufacturers of light-sport category aircraft may design and manufacture a broader array of aircraft, including rotorcraft and powered-lift. In addition, the rule allows for light-sport category aircraft with increased seating, without weight limits, higher speeds, new types of propulsion systems, new propeller types, retractable landing gear, and aircraft with simplified flight controls. Sport pilot privileges are expanded to include a broader array of aircraft and new privileges. New privileges for sport pilots include operating helicopters, operating at night, operating aircraft with retractable landing gear, operating aircraft with constant speed propellers, and operating high-performance airplanes. These new privileges for sport pilots are available via training and endorsements. Operating privileges for certain light-sport category aircraft are expanded

to include certain aerial work. Lastly, repairman certificate (light-sport) privileges are expanded to allow work on all aircraft in the expanded light-sport aircraft category.

Though relieving to the public, these expansions are based on safety data, the safety continuum, and other concepts aimed to increase safety. Per the safety continuum concept, FAA bases the rigor of certification requirements on the exposure of the public to risk for an aircraft operation. As the risk increases due to increased operating privileges and aircraft capability, the rigor of certification requirements also increases.

In 2004, FAA published the "Certification of Aircraft and Airmen for the Operation of Light-Sport Aircraft" final rule (69 FR 44771, July 27, 2004) ("the 2004 final rule"), which established rules for the manufacture, certification, operation, and maintenance of light-sport aircraft. The successful safety record of light-sport category aircraft since the 2004 final rule validates certification requirements established in that rule and provides support for expanding the scope of certification for light-sport category aircraft and operations. As a result, FAA identified the Modernization of Special Airworthiness Certification (MOSAIC) rule as an opportunity to expand the 2004 final rule to include a wider variety of aircraft, increase performance, and increase operating privileges to extend these safety benefits to more aircraft. FAA intends for these expansions to increase the safety of recreational aviation by encouraging aircraft owners, who may be deciding between an experimental aircraft or a light-sport category aircraft, to choose light-sport category aircraft that are higher on the safety continuum and, therefore, meet higher aircraft certification requirements. FAA also intends for this rule to increase the safety of light-sport category aircraft by eliminating the prescriptive weight limit for light-sport category aircraft that hinders safety-enhancing designs and by adopting new design, production, and airworthiness requirements.

This rule also addresses other aircraft that hold special airworthiness certificates. Specifically, this rule codifies additional special purpose operations for restricted category aircraft. In addition, this rule amends the duration, eligible purposes, and operating limitations for special airworthiness certificates issued for experimental purposes for additional phases of flight and space support vehicle operations.

The following sections discuss the provisions being adopted in this final rule.

1. Certification of Light-Sport Category Aircraft

This rule (i) adopts more performance-based rules to expand and enable innovation in the classes of aircraft that may be certificated using consensus standards as light-sport category aircraft, including emerging aircraft types; (ii) removes prescriptive weight limits that hinder incorporation of safety-enhancing designs and equipage; (iii) increases the maximum stall speed for light-sport category airplanes and gliders; (iv) enables more capable and robust aircraft for the pilot training environment; (v) allows for increased capacities for passengers, fuel, and cargo; (vi) allows electric and other alternative propulsion sources; and (vii) allows faster, higher-performing aircraft that are more suitable for personal travel. Together, based on the safety record under the 2004 final rule, these changes will enhance safety by allowing for a more appealing alternative to experimental amateur-built (EAB) aircraft that do not meet FAA design, production, or airworthiness standards.

2. Sport Pilot Certification

This rule expands privileges for what aircraft a sport pilot can operate, including privileges to operate many of the new light-sport category aircraft and additional normal category aircraft while retaining the current limit to carriage of two occupants, including the pilot. This rule allows use of four-seat airplanes; adds a new model-specific privilege

for aircraft with unconventional simplified flight controls designation; and adds new privileges for operating helicopters, operating aircraft at night, aircraft with retractable landing gear, and airplanes with constant speed propellers. This rule also amends the limits on maximum stall and cruise speed and removes weight and powerplant limitations.

3. Maintenance and Repairman (Light-Sport)

This rule revises privileges for repairman certificate (light-sport) holders to align with the expansion of aircraft categories that will be eligible for light-sport category airworthiness certificates. In addition, light-sport repairman privileges are expanded to allow a light-sport repairman to conduct the condition inspection on amateur-built aircraft that are of the same category and class, as applicable, of aircraft for which the repairman was certificated. This rule also revises the requirements for manufacturer-issued safety directives and revises requirements for performing repairs and alterations of light-sport category aircraft.

4. Operations

This rule revises operating limitations for restricted category aircraft, experimental aircraft, and light-sport category aircraft. This rule also codifies a Congressional mandate to enable certain aircraft with an experimental airworthiness certificate to conduct space support vehicle flights carrying persons or property for compensation or hire without an air carrier certificate or exemption. This rule also makes minor revisions to right-of-way rules and operations in the vicinity of airports in Class G airspace.

5. Experimental Aircraft

This rule establishes a new purpose for which experimental airworthiness certificates may be issued to former military aircraft to improve alignment between

certain operations of former military aircraft and the experimental airworthiness certificates that authorize their operation. This rule also increases the duration of certain experimental airworthiness certificates from one to three years.

6. Restricted Category Aircraft

This rule enhances the requirements for the certification of former military aircraft in the restricted category by requiring the aircraft to have a service history with the U.S. Armed Forces. Under 14 CFR 21.25(b)(7), FAA has approved additional special purpose operations for which restricted category aircraft may be certificated. Currently, those additional purposes are only listed in FAA policy documents for type and airworthiness certification of these aircraft. This rule codifies special purpose operations that have already been published for public notice in the *Federal Register*.

7. Noise

This rule enables persons to voluntarily establish compliance with part 36 noise requirements and provide a statement of compliance to FAA for a light-sport category aircraft.

B. Summary of the Costs and Benefits

The rule largely expands opportunities for light-sport category aircraft. These expansions may result in safety benefits; there may also be associated design and production costs. FAA does not anticipate more than minimal incremental costs to implement provisions of the rule and does not have data to estimate any cost savings, such as those that could result from operating certain light-sport category aircraft in aerial work for compensation.

II. Authority for This Rulemaking

FAA's authority to issue rules on aviation safety is found in title 49 of the United States Code (U.S.C.). Subtitle I, section 106 describes the authority of FAA Administrator. Subtitle VII, Aviation Programs, describes in more detail the scope of the agency's authority. This rulemaking is promulgated under the authority described in 49 U.S.C. 106(f), which establishes the authority of the Administrator to promulgate and revise regulations and rules related to aviation safety. This rulemaking is also promulgated under 49 U.S.C. 44701(a)(2)(A) and (a)(5), which provides that FAA Administrator shall promote safe flight of civil aircraft in air commerce by prescribing regulations and minimum standards: (1) in the interest of safety for inspecting, servicing, and overhauling aircraft, aircraft engines, propellers, and appliances, and (2) that FAA finds necessary for safety in air commerce and national security; 49 U.S.C. 44703, which provides the general authority of the Administrator to prescribe regulations for the issuance of airman certificates when the Administrator finds, after investigation, that an individual is qualified for, and physically able to perform the duties related to, the position authorized by the certificate; 49 U.S.C. 40103(b)(1) and (2), which directs FAA to issue regulations: (1) to ensure the safety of aircraft and the efficient use of airspace; and (2) to govern the flight of aircraft for purposes of navigating, protecting and identifying aircraft, and protecting individuals and property on the ground; and 49 U.S.C. 44715, which provides the Administrator the authority to prescribe regulations to control and abate aircraft noise and sonic boom. These regulations are within the scope of those authorities because they amend rules for the manufacture, certification, operation, maintenance, and alteration of light-sport category aircraft, amend rules related to restricted category aircraft and experimental airworthiness certification, and amend

rules related to sport pilot and repairman certification. Under Sec. 135, Public Law 116-260, 134 Stat. 1182, FAA has authority to set standards for maintenance technician schools, and this rulemaking incorporates such standards by reference in part 147. In addition, this rulemaking codifies section 581 of the FAA Reauthorization Act of 2018 (Pub. L. 115-254), which amended 49 U.S.C. 44740 to allow the operator of an aircraft with a special airworthiness certification in the experimental category to conduct a space support vehicle flight carrying persons or property for compensation or hire. The final rule also addresses section 824 of the FAA Reauthorization Act of 2024 (Pub. L. 118-63), which requires that FAA issue a final rule for MOSAIC not later than 24 months after the date of enactment of that Act, May 16, 2024.

III. Background

A. History of Light-Sport Category Aircraft

In the NPRM (88 FR 47650, July 24, 2023), FAA proposed to amend rules related to the certification and operation of light-sport category aircraft. That NPRM aimed to modernize the regulatory approach to light-sport aircraft by incorporating performance-based requirements that reflect advances in technology and uses for this type of aircraft. The NPRM was designed to respond to the evolving needs of this sector and provide for future growth and innovation without compromising safety.

The 2004 final rule provided for the operation and manufacture of aircraft weighing less than 1,320 pounds (or 1,430 pounds for aircraft intended for operation on water). These "light-sport" aircraft included airplanes, gliders, balloons, powered parachutes, weight-shift-control aircraft, and gyroplanes. FAA bases the rigor of certification requirements and operational limitations on a safety continuum that assesses the exposure of the public to risk for each aircraft and operation; as the risk increases due

to increased operating privileges and aircraft capability, the requirements and corresponding rigor of requirements and procedures for certification increase.

In the 2004 final rule, FAA established a level of certification for light-sport category aircraft between normal category aircraft and aircraft holding experimental airworthiness certificates in view of intended operating privileges and aircraft capability. The NPRM used EAB aircraft for the safety continuum discussions since they are similar to light-sport category aircraft. EAB aircraft are largely used for recreational purposes, are flown by sport pilots and pilots with higher grade certificates and generally have the same flight envelope and occupancy limits. Amateur-built aircraft are below light-sport category aircraft on the safety continuum because of their lower safety assurance for aircraft design and being subject to stringent operating limitations. Amateur-built aircraft have no regulatory design requirements for suitability of materials used, structural integrity, or instruments, equipment, and systems. Amateur-built aircraft are limited to non-commercial operations for the purpose of education and recreation.

B. Summary of the NPRM

Since the 2004 final rule, light-sport category aircraft have shown a lower accident rate than EAB airplanes.[1] FAA considered that the successful safety record of light-sport category aircraft validated certification requirements established in the 2004 final rule and provided support for expanding the scope of certification for light-sport category aircraft and operations. As a result, FAA proposed to expand the 2004 final rule to include a wider variety of aircraft, increase performance, and increase operating privileges to extend these safety benefits to more aircraft. FAA intended for these expansions to increase safety by encouraging aircraft owners, who may be deciding

between an EAB or a light-sport category aircraft, to choose aircraft higher on the safety continuum and, therefore, meet higher aircraft certification requirements.

FAA's proposal addressed other aircraft that hold special airworthiness certificates. Specifically, FAA proposed to codify additional special purpose operations for restricted category aircraft that FAA has previously approved under discretion provided in § 21.25(b)(7). In addition, FAA proposed to amend the duration, eligible purposes, and operating limitations for special airworthiness certificates issued for experimental purposes.

FAA identified proposals to improve both the safety and functionality of light-sport category aircraft and light-sport category kit-built aircraft. FAA proposed to amend aircraft, pilot, maintenance, and operational requirements to increase both the safety and performance of these aircraft while mitigating risk. FAA acknowledged that this is a balancing act–where the risk is increased due to greater capability in one area, mitigations may be required from the other areas.

FAA proposed to establish performance-based requirements for certification of light-sport category aircraft. As a fundamental matter, FAA proposed to restructure how certification requirements for light-sport category aircraft are presented in FAA's regulations. Currently, issuance of special airworthiness certificates under § 21.190 for light-sport category aircraft, sport pilot certificates under part 61 subpart J, and repairman certificates (light-sport) under part 65 are limited by a number of aircraft design limitations included in the definition of light-sport aircraft in § 1.1. FAA proposed to remove that definition and, in its place, write performance-based standards for aircraft and airman certification into part 21, 61, and 65, where these requirements for other types

of aircraft and airman certification reside. This would make FAA's regulatory approach to light-sport category aircraft more consistent with its approach to other types of aircraft.

Another important change in the NPRM was to eliminate the weight limits for light-sport category aircraft. To enable the design and manufacture of light-sport category aircraft that are safe to fly with increased capacity and ability, FAA proposed to apply new design and manufacturing requirements. This would allow growth and innovation within performance-based safety parameters. FAA also proposed to expand aircraft that sport pilots can operate. Under the NPRM, sport pilots could operate airplanes designed with up to four seats, even though they would remain limited to operating with only two occupants. Finally, FAA proposed to change the name of the repairman certificate (light-sport aircraft) to repairman certificate (light-sport). This certificate would apply to existing and new types of aircraft certificated in the light-sport category, such as rotorcraft and powered-lift. Related provisions would update the requirements for maintenance.

FAA also proposed regulations related to noise for light-sport aircraft, expanding applicability of part 36 noise requirements. To provide flexibility and reduce burdens of compliance with these noise requirements, FAA proposed options for compliance: (1) conventional noise testing per part 36, (2) a means of compliance via FAA-approved, industry consensus standards, or (3) using the noise requirements determined by FAA to be appropriate for the aircraft. FAA expects that any consensus standards would not be limited to physical measurements of noise during test flights. They might instead to be based on empirical data, analytical modeling, or generally accepted noise prediction methods if the underlying noise prediction methods are found to be robust.

In addition to maintenance and manufacturing requirements, FAA also proposed to expand the kinds of operations that can be performed by light-sport category aircraft. Specifically, FAA proposed to permit light-sport category aircraft that meet applicable consensus standards to be used in certain aerial work operations.

In addition, FAA proposed amendments to experimental aircraft regulations. FAA proposed new operating purposes for former military and kit-built aircraft and clarified who may apply for the operating purpose for market survey. The proposed regulations also included new operating limitations authorizing flight over densely populated areas and in congested airways for all phases of flight, and new regulations authorizing experimental aircraft to conduct space support vehicle flights. The proposed regulations also would have increased certificate duration and extend applicability of noise requirements to aircraft that do not conform to a type certificate.

FAA further proposed amendments related to restricted category aircraft, including a codification of special operating purposes for restricted category aircraft. FAA also proposed minor changes to right-of-way rules and operations around airports in Class G airspace.

IV. Discussion of Comments and the Final Rule

A. General Overview of Comments

FAA received approximately 1,315 comments in response to the NPRM from a variety of commenters, including aircraft manufacturers and operators, aviation training companies, other aviation companies, trade associations, civil aviation authorities, and individuals. Trade associations commenting on the NPRM included: Aeronautical Repair Station Association (ARSA), Air Line Pilots Association (ALPA), Aircraft Electronics Association (AEA), Aircraft Owner's and Pilot's Association (AOPA), Association for

Uncrewed Vehicle Systems International (AUVSI), Aviation Suppliers Association (ASA), Commercial Drone Alliance (CDA), Experimental Aircraft Association (EAA), General Aviation Manufacturers Association (GAMA), Helicopter Association International now known as Vertical Association International (VAI), Light Aircraft Manufacturers Association (LAMA), Manufacturers Flight Test Council (MFTC), National Agricultural Aviation Association (NAAA), National Air Transportation Association (NATA), National Association of Flight Instructors (NAFI), National Business Aviation Association (NBAA), U.S. Paragliding & Hang Gliding Association (USPHA), and United States Ultralight Association (USUA). Manufacturers commenting on the NPRM included: Aerospace Volatus Infrastructure & Energy Solutions, Air Tractor, AIR VEV, AutoGyro, Cirrus Aircraft, Cub Crafters, Desert Aerospace, Doroni, Elanus, Flight Design, Hartzell Propeller, Jump Aero, LEO Flight Corporation, Piper Aircraft, Inc. (Piper), Reliable Robotics Corporation (Reliable Robotics), Skyryse, Sonex, LLC (Sonex), Streamline Designs, LLC (Streamline Designs), Van's Aircraft, and Whisper Aero. Operators commenting on the NPRM included: Aura, Bombardier, Inc. (Bombardier), International Air Response (IAR), Metrea Strategic Mobility (MSM), Textron Aviation (Textron), Virgin Galactic, and Zipline. The only United States government organization commenting on the NPRM was U.S. Naval Air Systems Command (NAVAIR). Civil Aviation Authorities commenting on the NPRM included: National Civil Aviation Agency of Brazil (ANAC), European Aviation Safety Agency (EASA), and Transport Canada Civil Aviation (TCCA).

Group comments included the following: AEA and ARSA (hereafter, AEA/ARSA) as a group; EAA, AOPA, NATA, and NBAA as a group; and LEO Flight

Corporation, Doroni, Aerospace Volatus Infrastructure & Energy Solutions as a group called the Future Flight Federation (3F).

Table 1 provides a general summary of commenter support:

Table 1. Summary of Commenter Support

Support	Number of Commenters
Oppose	11
Support (no changes suggested)	22
Support (changes suggested)	1,282
Total:	1,315

Overall, most commenters expressed general support for FAA's NPRM. Hundreds of individual commenters voiced support for, agreed with, or applauded the NPRM generally or for specific proposals within the NPRM, and many of those individuals advocated for proceeding as quickly as possible with finalizing and implementing a final rule. In addition, many associations, companies, and other non-individual commenters also expressed support for the NPRM generally, even if they had specific recommendations for improvement. For example, EAA, AOPA, NATA, and NBAA's comment "commended" FAA for acknowledging the success of the light-sport category and proposing the MOSAIC rule expansions and they strongly supported FAA committing the resources to move forward and implement the proposed changes. GAMA supported key aspects of the NPRM such as increasing what aircraft sport pilots can fly and which aircraft qualify for light-sport category special airworthiness certificates. VAI commented positively on including rotorcraft in the light-sport category of aircraft, noting that it will increase the variety of available aircraft and provide economic benefits. Van's Aircraft characterized the MOSAIC NPRM as a "revolutionary change" that was "close to the mark" and a "success" even given that Van's Aircraft had constructive feedback. Hartzell Propeller's comment applauded FAA taking on MOSAIC and broadly

supported the expansion of light-sport aircraft and sport pilot capabilities. Sonex commented it was extremely supportive of the NPRM, and it expected positive business impacts, an expanded economic pathway to pilot participation, and the availability of new aircraft with enhanced safety features at a more affordable price compared to type-certified aircraft. Skyryse supported the rulemaking and appreciated FAA's "forward-thinking approach to certification." AIR VEV also supported the NPRM as allowing advancement and innovation while maintaining safety.

However, most commenters also recommended revisions to the proposed rule that they believed would improve the rule. A small minority of commenters were generally unsupportive of the NPRM. For example, AEA/ARSA strongly asserted that certain aspects of the NPRM concerning light-sport category aircraft were unnecessary and duplicative, stemming from their preference that FAA amend and better utilize the primary category. AEA/ARSA also stated the proposed rule disregards the negative impact on design, certification, and installation of retrofit technologies, as well as the aviation maintenance service industry. ALPA commented the safety record of light-sport category aircraft warrants a "more formalized safety approach" to certifying light-sport category aircraft, certifying airmen, and establishing supporting operating rules and privileges.

The following provides a high-level overview of key issues raised by commenters that are addressed in more detail below.

Aircraft Stalling Speed for Certification of Light-Sport Category Aircraft

FAA received approximately 120 comments on this topic. Most commenters wanted an increased stall speed without lift-enhancing devices (V_{S1}) with the largest support for a V_{S1} increase to 58 knots calibrated airspeed (CAS), but with a substantial

number wanting an even higher increase. A few commenters opposed a stall speed increase. Recommendations to increase V_{S1} varied widely and covered topics such as maximum stall speed with flaps (V_{S0}), design maneuvering speed (V_A), maximum speed in level flight with maximum continuous power (V_H), lift-enhancing devices, safety equipment, gross weight, crashworthiness, legacy aircraft, designs, handling, and kinetic energy.

Simplified Flight Controls for Light-Sport Category Aircraft

Several commenters requested clarification that primary flight controls were not available or used on aircraft with simplified flight controls. A few commenters suggested language that would provide pilots access to primary flight controls. Some commenters requested clarification on flight path control, power adjustment, discontinuing or altering flight, and inadvertent activation of safety features. A few commenters recommended that the manner with which the pilot is expected to control the flight path of the simplified flight controls aircraft should not change in the presence of any single likely failure. Two commenters thought the proposed § 22.180 provisions were too prescriptive. TCCA asked for clarification on the use of joy-stick controllers. ALPA did not support simplified flight controls for light-sport category aircraft because it may result in an unquantified risk. One commenter wanted simplified flight controls to be defined.

Size of Rotorcraft and Powered Lift

Several commenters recommended the use of a maximum gross weight in the range of 2,640 to 5,000 lbs, a 6 lb-ft^2 main rotor disc loading limit, or limiting the number of engines. Another commenter stated market forces will limit powered-lift gross weights.

Aircraft Stalling Speed Limit for Sport Pilot Privileges

FAA received approximately 485 comments on this topic. Most of the public comments recommend increasing the proposed V_{S1} CAS stall speed, using V_{S0}, or using some other stall speed reference as the stall speed limitation, to permit a greater number of existing certificated airplanes with similar size, weight, and performance to be operated by sport pilots. A majority of the commenters indicated that an aircraft they operate, with higher stall speeds, was as safe or safer than those with lower stall speeds. Some commenters also recommend increasing the maximum stall speed for gliders.

Passenger Limitation for Sport Pilot Privileges

A large number of commenters recommended allowing additional passengers when operating four-seat airplanes.

Medical Requirements for Night Operations by Sport Pilots

A large number of commenters recommended that FAA allow night operations under the current driver's license medical qualification requirement or additional training requirements.

Altitude Limitations for Sport Pilots

A large number of commenters recommended that FAA should permit sport pilots to operate at higher altitudes than currently permitted.

Light-Sport Repairman Training Courses

Approximately 250 comments were received on this topic. Commenters were concerned that aligning training courses with the Mechanic ACS equates to repairman courses increasing in time and cost. Some commenters suggested FAA's proposal would require light-sport repairmen to receive the same training in terms of time and complexity as mechanics. Many commenters recommended creating a system of certificate

endorsements, training course modules, or both. Many comments asserted FAA is changing a process for no reason that has been proven to be sufficient.

Light-Sport Repairman Certificate Privileges

Approximately 105 comments were received on this topic. Most comments requested that FAA expand light-sport repairman privileges to allow these repairmen to conduct the annual condition inspection on aircraft issued an experimental airworthiness certificate for the purpose of operating an amateur-built aircraft. Several commenters also requested to expand the certificate privileges to allow these repairmen to work on aircraft issued a standard airworthiness certificate.

Third-Party Repairs and Alterations of Light-Sport Category Aircraft

Some commenters, including AEA/ARSA, stated the proposed rule disregards the negative impact on design, certification, and installation of retrofit technologies, as well as the aviation maintenance service industry. Some commenters requested FAA make greater use of the language "a person acceptable to the Administrator" to allow greater use of third-party alterations and repairs when those alterations meet applicable standards. Some commenters requested increased opportunities for retrofit products for upgrades and modifications, especially relating to safety-enhancing technologies.

Aircraft Noise

FAA received comments from industry, pilots, owners of light-sport aircraft, and members of the public affected by aircraft noise. Most of these commenters questioned the need for noise requirements, noting that LSA are generally already quiet. Some of these commenters expressed concern that meeting these noise requirements might necessitate redesigns that could negatively impact performance and safety. Many commenters supported using industry consensus standards and self-declaration of noise

compliance as methods to reduce costs and avoid delays in certification. Regarding experimental aircraft, industry groups such as GAMA, EAA, and various association members and companies opposed noise requirements for EAB aircraft. Some expressed opposition to noise requirements for any type of experimental aircraft. Industry commenters generally supported the use of industry consensus standards for the noise certification of MOSAIC aircraft but were concerned that developing those standards would require resources and pose technical challenges. A number of individual and community commenters urged increased noise regulation, asserting that aircraft are too noisy.

Operations of Space Support Vehicles

ALPA and Virgin Galactic were both generally supportive of the proposed regulatory language. However, both raised concerns about the development of guidance materials and the agency's internal policies for the issuance of operating limitations.

Airworthiness Certification of Restricted Category Aircraft

International Air Response (IAR), with several other restricted category aircraft operators expressing agreement, stated there was insufficient notice of the changes to the restricted category and such changes should be part of a separate rulemaking effort specifically for the restricted category. IAR asserted this is problematic and since restricted category operators may not be aware of the rule, it could result in adverse effects on businesses.

B. Differences Between the NPRM and the Final Rule

Table 2 summarizes key changes from the NPRM made in this final rule.

Table 2. Summary of Key Changes from NPRM

Proposed Action in the NPRM	Adopted by this Final Rule	Final Regulatory Citation (14 CFR)	Additional Discussion in Section of Preamble
The NPRM proposed to revise the definition of consensus standard.	This final rule removes the definition.	§ 1.1	IV.G.5
The NPRM proposed to add a new provision for issuance of an experimental airworthiness certificate to former military aircraft to improve alignment between certain operations of former military aircraft and the experimental airworthiness certificates which authorize their operation.	This final rule expands this provision to enable repositioning flights between any public aircraft operation, not just those supporting the U.S. Armed Forces and adds a provision to allow check flights following repairs, alterations, or maintenance.	§ 21.191(j)	IV.L.1.c
The NPRM proposed to increase the light-sport category maximum stall speed for airplanes from 45 to 54 knots CAS V_{S1}.	This final rule increases the light-sport category maximum stall speed to 61 knots CAS V_{S0} for an airplane and 45 knots CAS V_{S0} for a glider.	§ 22.100(a)(3)	IV.F.6.b and c
The NPRM proposed to apply control and maneuverability requirements to the certification of light-sport category aircraft	This final rule removes the reference to primary flight controls so the provision is also applicable to aircraft designed with simplified flight controls.	§ 22.105	IV.F.13
The NPRM proposed to apply part 36 noise requirements to most light-sport category aircraft.	This final rule makes compliance with part 36 voluntary for light-sport category aircraft.	§ 36.0	IV.N.
The NPRM proposed to increase the	This final rule increases the maximum stall speed	§ 61.316(a)(1)	IV.H.1.c

Proposed Action in the NPRM	Adopted by this Final Rule	Final Regulatory Citation (14 CFR)	Additional Discussion in Section of Preamble
maximum stall speed for airplanes that a sport pilot may operate from 45 to 54 knots CAS V_{S1}.	for airplanes that a sport pilot may operate to 59 knots CAS V_{S1}.		
The NPRM did not propose to amend the limitation listed in § 61.316(b) for aircraft that a sport pilot may operate that the aircraft meet certain limits "since its original certification."	This final rule adds a provision allowing a sport pilot to operate an aircraft with retractable landing gear or an airplane with a manual controllable pitch propeller regardless of the configuration status of the aircraft when it was originally certificated if the pilot meets the training and endorsement requirements specified in § 61.331.	§ 61.316(b)	IV.H.1.j. and IV.H.1.k
The NPRM discussed the equivalency of a repairman certificate (light-sport aircraft) and a repairman certificate (light-sport) but did not include a related provision in § 65.107. The NPRM discussed the equivalency of previously issued aircraft class privileges with the new aircraft category privileges, but did not include a related provision in § 65.107.	This final rule adds a provision in § 65.107(f) consistent with the NPRM discussion, that establishes the equivalency of repairman certificates (light-sport aircraft) with aircraft class privileges issued before the effective date of this final rule to repairman certificates (light-sport) with aircraft category privileges issued under this final rule.	§ 65.107(f)	IV.I.2.a

Proposed Action in the NPRM	Adopted by this Final Rule	Final Regulatory Citation (14 CFR)	Additional Discussion in Section of Preamble
The NPRM did not propose changes to privileges for a holder of a repairman certificate (light-sport).	The final rule expands privileges for a holder of a repairman certificate (light-sport) to perform an annual condition inspection on § 21.191(g), experimental amateur-built aircraft.	§ 65.109	IV.I.10.b
The NPRM did not propose expansions of operating limitations applicable to restricted category aircraft.	The final rule adds exhibition to the list of operations that are considered necessary to accomplish the work activity directly associated with a special purpose operation.	§ 91.313(b)(3)	IV.K.3

C. FAA Safety Continuum

The safety continuum is a concept that FAA has used for years.[2] It is "[t]he concept that one level of safety is not appropriate for all aviation activities."[3] The concept draws statutory support from 49 U.S.C. 44701(d)(B), which requires the Administrator to consider "differences between air transportation and other air commerce" when prescribing regulation.[4] Per the safety continuum concept, FAA bases the rigor of certification requirements on the potential risk to the public for an aircraft operation. As risk increases with increased operating privileges and aircraft capability, FAA mitigates that risk through more rigorous certification requirements. For example, EAB have not been found to meet FAA or FAA-accepted design or production standards and therefore present a higher level of risk. FAA mitigates that risk for EAB via operating limitations that reduce the risk to the public. Light-sport category aircraft under this rule are subject to a higher rigor in certification requirements and procedures for design, production, and

airworthiness than EAB aircraft. Therefore, light-sport category aircraft are higher on the safety continuum than EAB aircraft and can be operated under less restrictive operating limitations than EAB aircraft.

FAA included two fundamental safety arguments to support the proposed rule. The first safety argument was that certain changes would improve the safety of the light-sport category. FAA noted removing the weight restriction on light-sport category aircraft would provide manufacturers opportunities to incorporate additional safety-enhancing designs and equipment; design airframes that are more rugged for the flight-training environment; increase fuel load and aircraft range; allow for greater cabin size to enable greater occupant heights and weights; improve aircraft handling in gusts, turbulence, and crosswinds; and increase the suitability of light-sport category aircraft for other intended operating purposes, including recreation and personal travel. Also, adding performance-based part 22 requirements would increase the rigor and expected safety outcomes of design, production, and airworthiness requirements for the certification of light-sport category aircraft.

Secondly, FAA explained that other amendments to the rules applied to light-sport category aircraft would improve safety more broadly within general aviation (GA) by making light-sport category aircraft a more appealing alternative to experimental aircraft that have higher fatal accident rates. The current fleet of registered EAB aircraft has approximately 26,450 aircraft. EAB aircraft are not subject to any design limits such as aircraft class, weight, number of seats, number or type of engines, stalling speed, or maximum speed. EAB are not subject to design or production standards in 14 CFR or in other FAA-accepted standards. Conversely, under the 2004 final rule, the light-sport category was subject to limits in number of seats, stalling speed, not-to-exceed speed, and

cabin pressurization. Fatal accident rate data comparing similar EAB, light-sport, and normal category airplanes reflect accident rates that generally align with the safety continuum concept; that is, accident rates for light-sport category airplanes fall between the accident rates for EAB and normal category airplanes.[5] FAA views this as validation of the consensus standards and certification requirements used under the original rules. The final rule improves those certification requirements with new design, production, and training requirements for compliance staff. Some expansions enable safety improvements of light-sport category aircraft, primarily via relieving weight limitations. Other expansions increase risk for operations of light-sport category aircraft; that is, enabling four occupants in airplanes exposes the public to more risk than does enabling two occupants, but still less than for EAB aircraft that are not subject to seating or passenger limits. And still other expansions are clearly intended to increase the performance and usefulness of light sport category aircraft, such as enabling more fuel capacity, four seats for airplanes, higher speeds for personal transportation, expanding operating privileges for light-sport category aircraft, and expanding sport pilot privileges. Importantly, these expansions of light-sport category aircraft design, performance, and operation would increase safety more broadly within recreational GA because light-sport category aircraft would become a more appealing choice for those owners who may otherwise be considering purchasing experimental aircraft. Overall, this shift toward light-sport category aircraft would increase the numbers of aircraft that are designed and manufactured more safely than experimental aircraft.

Furthermore, in 2006, FAA published a Roadmap for General Aviation Aging Airplane Programs[6] that was designed to aid industry in identifying and mitigating risks of aging aircraft. At the time, the roadmap identified the general aviation fleet as having

an average age of more than 35 years old. Almost 20 years later, the age of these aircraft is reflected in FAA data that shows their attrition. The availability of non-experimental fixed-wing single-engine airplanes has decreased from 139,519 in 2010 to 126,076 in 2022, a reduction of over 13,400 airplanes.[7] With fewer new models being produced in the normal category and the ever-increasing average age and attrition of normal category airplanes, pilots naturally will be driven to other alternatives such as light-sport category and EAB airplanes. Up to now, pilots have favored EAB airplanes because their performance resembles that of the normal category. However, this rule should provide a safer alternative of equivalent performing, factory-built light-sport category aircraft that meet airworthiness requirements.

Though expanding the light-sport category to attract new entrants from those aircraft "lower" on the safety continuum was the intent of the proposed rule, such expansions raise the question of what happens when new entrants are from those who may have otherwise chosen aircraft "higher" on the safety continuum. Some commenters argued that such a shift away from normal category aircraft, for example, would reduce overall safety and counteract the benefit of shifting ownership away from EAB aircraft. The fatal accident rate data discussed in the NPRM for non-commercial, single, piston-engine light-sport and normal category airplanes shows these rates have been very similar since 2018. Also, though fatal accident rates for EAB airplanes have been generally decreasing since 2011, these rates are clearly higher than for the light-sport and normal categories. That is, these relative comparisons of fatal accident rates mitigate concerns with potential shifts of new entrants away from type-certified aircraft and further support the safety arguments for expanding the light-sport category. FAA also notes the ability to

purchase new, less expensive EAB aircraft has driven pilots from normal category to EAB aircraft.

A goal of this final rule is to apply the safety continuum to safely expand light-sport category aircraft and light-sport airman rules via safety standards of appropriate rigor that balance flexibility for manufacturers and availability to consumers. Given the proven track record of LSA consensus standards since at least 2011,[8] FAA believes it can expand the privileges afforded light-sport category aircraft with an increase in safety based on the flexible consensus standard process. By applying new part 22 requirements to and loosening operational restrictions on light-sport category aircraft, FAA safely expands the middle ground on the safety continuum between relatively risky experimental aircraft and relatively expensive normal-category aircraft.

FAA received approximately 16 comments related to FAA's fundamental safety arguments for the NPRM and the safety continuum. Though fundamentally supporting the premise of FAA's proposals for the manufacture, certification, operation, maintenance, and alteration of light-sport aircraft, AEA and ARSA jointly asserted that the proposed rules duplicate the primary category and the arguments for amending design and certification requirements for light-sport aircraft are unnecessary, duplicative, and frivolous rulemaking.

FAA disagrees. Eligibility for certification in the primary and (current or as-amended) light-sport categories are different in terms of acceptable classes of aircraft, weights, propellers, and engines. In addition, airworthiness standards for the primary category are largely taken from the applicable and more rigorous normal category standards, whereas light-sport category aircraft requirements in part 22 are less rigorous. Finally, design and production certification procedures for the primary category, as

opposed to the light-sport category, rely on the more rigorous methods of showing and finding compliance to applicable requirements during type and production certifications. FAA does not issue a type or production certificate to a manufacturer of light-sport category aircraft but, instead, relies on a manufacturer's statement of compliance to applicable requirements. FAA, therefore, disagrees that the amended light-sport category duplicates the primary category.

As discussed below, AEA and ARSA commented that prior FAA attempts over the last thirty years to apply the safety continuum, simplify certification procedures, enable new technologies, and improve safety have largely under-delivered for the industry. AEA and ARSA stated another rulemaking is unwarranted. Contrary to this sentiment, the vast majority of comments received on the NPRM were generally in favor of the MOSAIC rulemaking effort, even in cases where there were specific suggestions or recommendations as to particular sections of the proposed rule. FAA notes that all but the newest 14 CFR parts have been amended multiple times. Despite FAA's best efforts to collect data, form arguments, and draft rules, and despite strong contributions from the public in the form of aviation rulemaking committees, recommendations, data, comments submitted to rulemaking dockets, and such, few rules are static. That rules require regular amendment is not a reflection of weaknesses with the rulemaking process but of its strength in continuously adjusting based on experience with prior amendments, changes in the industry, advances in technology, and such.

FAA disagrees with the notion that this rulemaking is frivolous and believes changes to the CFR in this final rule are supported with appropriate rationale. And generally, as AEA and ARSA "acknowledge," the primary category "predated the wide-spread development of industry-led aviation consensus standards and[,] as such, [it] has

not been utilized to its intended purpose."[9] Over 200 models of light-sport category aircraft have been manufactured compared with seven primary category aircraft models, even though the primary category has been available to manufacturers for over thirty years.

AEA and ARSA commented that the risk related to an unbound, speed-based aircraft proposal has not been addressed. FAA disagrees with the comment that the light-sport category is "unbound." The light-sport category is subject to the eligibility requirements of § 22.100 and the design, production, and airworthiness requirements of part 22. FAA considered risk in applying its safety continuum concept. Per the safety continuum concept, FAA compares the level of exposure of the public to risk with the level of rigor in issuance of a certificate. For recreational operations, FAA considered EAB aircraft, light-sport category aircraft, primary category aircraft, and normal category aircraft. Though accident rates for EAB aircraft have been consistently declining for about 10 years, that category remains a concern to FAA because it is not required to meet 14 CFR or FAA-accepted design or production standards. In addition, EAB aircraft are "unbounded" in terms of aircraft design, including aircraft class, weight, number of seats, number and type of engines, stalling and maximum speeds, and 14 CFR airworthiness standards. The proposed rule addressed the risk consideration of all such expansions, including the increase of stall and maximum speeds for light-sport category aircraft. The changes to the rule will increase safety of light-sport category aircraft through the requirements of part 22 and by attracting aviators who would otherwise gravitate toward EAB aircraft.

AEA and ARSA commented that the safety continuum includes three pillars of recreational aircraft categories–light-sport, primary, and normal categories–and proposals

to one pillar affect the other pillars. AEA and ARSA commented that proposals must be weighed as to their effect on the entire safety continuum and the Agency, in coordination with industry, must consider all three pillars and develop policy and guidance to support 30 years of Agency promises.

FAA agrees that light-sport category aircraft should be considered in relation to experimental aircraft, primary category aircraft, and normal category aircraft. Though additional policies and guidance for applying the safety continuum to the "three pillars of recreational aviation" may be beneficial, FAA carefully applied safety continuum concepts in consideration of these three pillars in this rulemaking.

GAMA recommended that FAA develop policy, guidance, and training to enable consistent application and full benefits of safety continuum concepts for all general aviation products. GAMA commented that it supports proposed light-sport category size, performance and scope increases. However, GAMA asserted the removal of design limitations would increase design complexity and therefore increase risk. GAMA did not offer supporting data or a rationale for this assertion, nor did it state why or to what extent raising the aircraft speed or increasing the maximum number of seats from two to four would increase the design complexity to such a degree as to materially increase risks related to design compliance and aircraft conformity.

While increases in complexity and speed generally increase risk, FAA believes the degree of expansion in size, configuration, and performance of light sport category aircraft under this final rule may be implemented with common, well-proven aircraft designs, engines, propellers, systems, equipage, and technology. As such, and as discussed throughout the NPRM and this final rule, the complexity of light-sport category aircraft designs can be increased without an appreciable increase in risk related to aircraft

design compliance and conformity. For example, engine manufacturers typically offer a base engine model with small variations from that base design to achieve a range in horsepower to accommodate a range of aircraft weights and speeds. As another example, for retractable landing gear, the light-sport rules have included provisions for the manufacture of amphibious aircraft with retractable landing gear since 2007.[10] Through September 30, 2024, operator error led to 14 "gear-up" landings on land and 10 "gear-down" events on water with amphibious light-sport category airplanes. Except for those operator errors, retractable landing gear have not been a source of fatal accidents or safety issues related to compliance, conformity, or operations for amphibious, light-sport category airplanes.

Regarding the proposed expansions of operating privileges with light-sport category aircraft: aerial work, night operations, and personal, non-commercial transportation, GAMA also commented on increased risk from expanding operations along with increasing the maximum number of occupants. FAA considered safety and risk in its rationale for each of these expansions. Though GAMA raised general risk concerns with these expansions, GAMA did not address the specific rationale for these proposals, provide specific evidence of risk, or provide any new information or data that would cause FAA to change its determination to finalize these as proposed.

GAMA commented that each area of expansion of light-sport category design limits, performance capabilities, and operating privileges lack sufficient supporting operational safety data and need more consideration and understanding of FAA intended risk mitigations. Though GAMA members did not attain consensus on specific recommendations, GAMA also compiled various, non-consensus recommendations from different members in its comments for FAA to consider as mitigations. As discussed

previously, FAA considered each proposal using safety continuum concepts to achieve the appropriate, intended safety outcomes.

GAMA recommended further FAA risk evaluations related to design compliance, production conformance, and the proposed increases in the NPRM, and suggested FAA consider if additional safety requirements are appropriate.

Importantly, FAA notes the comments from GAMA members and from GAMA consider risk only in terms of how risk may change within the light-sport category from the proposed expansions. GAMA did not provide supporting data or rationale to support its assertion that each expansion of the light-sport category would increase risk. FAA also pointed out that, as discussed in the NPRM, FAA considered safety and risk for not only the light-sport category, but for broader ramifications of safety and risk to recreational general aviation stemming from the scope of the light-sport category in terms of design limits, aircraft performance, and operating privileges. GAMA's comments reflect an isolated focus on the light-sport category itself. FAA considered the goals and arguments for decreasing risk and improving safety more broadly within recreational general aviation and the overarching goal of attracting general aviation toward lower risk aircraft than EAB aircraft.

GAMA members suggested the following for potential consideration: first, a two-tiered concept for light-sport category aircraft based on design and production risks; second, FAA could apply risk mitigations via part 22 like the certification levels in part 23; and third, FAA could consider identifying high-risk design features that would be subject to a higher rigor of certification requirements. GAMA did not provide supporting data or rationale to support assertions that each expansion of design limitations would increase risks and necessitate this recommendation. The NPRM addressed risk

considerations of all expansions of light-sport category aircraft that could be designed and produced under this rule. Also, part 23 assigns certification levels based on maximum seating configurations: level 1 for 0 to 1 passenger; level 2 for two to six passengers; level 3 for seven to nine passengers; and level 4 for 10 to 19 passengers. With the maximum number of occupants for light-sport category aircraft limited to four for airplanes and two for other classes of aircraft in § 22.100(a), FAA finds that the range in complexity of light-sport category aircraft as signified by maximum seating configuration does not merit establishing multiple certification levels or tiers in part 22. Similarly, part 23 establishes low- and high-speed performance levels below and above 250 knots CAS that impact applicable part 23 airworthiness standards for type certification. Since the maximum speed of light sport category aircraft is limited to 250 knots CAS in § 22.100(a)(4), FAA finds the lower maximum speed of light-sport category aircraft does not merit the two-tiered approach of part 23 concerning maximum airspeed.

USUA commented that light-sport category aircraft fatal accident rates were comparable to type-certificated aircraft, implying that consensus standards are already high level and there may come a point where additional regulation is no longer safety enhancing. FAA notes that much of the additional regulation in this final rule constitutes expansions in eligibility of aircraft that may be certificated in the light sport category, operating privileges, and airman privileges. Rather than adding regulatory burden, such expansions generally give the public more options and privileges. In establishing new design, production, and airworthiness requirements under part 22, FAA was careful to set appropriate requirements for aircraft that fall between experimental aircraft and normal category aircraft on the safety continuum.

One commenter stated the logic of FAA's safety continuum concept is flawed and does not reflect that pilot error, not mechanical failure, is the leading cause of fatal accidents. FAA applies the safety continuum concept not only to rules related to aircraft certification but to rules for pilot, repairman, and operating certifications. Pilots holding an airline transport pilot certificate are subject to more rigorous certification requirements than sport pilots. Setting appropriate pilot certification requirements does not allow FAA to disregard safety improvements to regulations for aircraft certification. To maintain and continuously improve safety, FAA applies the safety continuum concept to not only pilot certifications, but to all safety regulations, including aircraft, repairman, and operating certification requirements.

That commenter also asserted the NPRM lacks statistical data supporting that increased operating privileges and aircraft capability increases risks to the flying public, and the data relied upon by FAA is "skewed." FAA disagrees. The data sources for flight hour and accident data were posted in the docket with the proposed rule and FAA used simple mathematical division of flight hours by the number of accidents to yield the accident rates cited.

This commenter further suggested that FAA should have used information from the 2020 AOPA Nall Report rather than the 2021 GA Survey because the GA Survey lacks data on the total number of flight hours flown by pilot certificate held. FAA notes that pilots of various levels of experience and grade of certificate may, in some cases, conduct similar operations along the safety continuum. The accident rates posted on the NPRM docket used data from the AOPA Nall Report and FAA GA Survey. However, the resultant accident rates in the NPRM were not intended to examine pilot experience level or the grade of pilot certificate. Instead, those rates are simple calculations of the

cumulative number of fatal accidents divided by cumulative flight hours per year for non-commercial, small, fixed-wing, fixed-landing-gear airplanes with reciprocating engines for each of three categories of aircraft. This is a common type of calculation that provides a top-level safety metric by combining all fatal accidents regardless of their root causes or corresponding pilot characteristics. In this case, the resultant accident rate trends generally show decreases from the EAB aircraft to light-sport category and again from the light-sport category to the normal category. Decreases in the EAB fatal accident rate trend reflect collaborative efforts between FAA and industry to adopt numerous voluntary safety improvements in aircraft equipage as well as flight test and operational procedures. Both decreases in fatal accident rate trends correspond with increased rigor in certification requirements and procedures for light-sport and normal category aircraft. These accident rate trend comparisons were helpful in assessing the safety outcomes of the certification requirements for light-sport category aircraft under the 2004 final rule and safety continuum arguments for expanding eligibility limits for this category under the NPRM and this final rule.

A commenter expressed concern about the proposed increased operating privileges for recreational pilots. That commenter asserted that FAA is focused on promoting aviation rather than safety by supporting sport pilots flying larger aircraft and trying to make recreational flying easier.

Recreational operations already occur in multiple categories and types of aircraft, including approximately 30,000 EAB aircraft. FAA disagrees that the NPRM is focused on promoting aviation rather than safety. Rather, the NPRM focused on applying safety continuum concepts to provide safer alternative aircraft for recreational operations. Though the increase of operating privileges or aircraft capability for light-sport category

aircraft considered in isolation may increase risk concerning light-sport category operations, those risks are more than offset by providing a safer, appealing alternative to EAB aircraft.

One commenter commented that the NPRM increases the complexity and decreases safety by allowing things like retractable landing gear, variable pitch propellors, multiple engines, and full authority digital electric controls (FADEC). This commenter also commented that the goal of the NPRM seems to be to increase the markets for these aircraft.

FAA disagrees. As described throughout the NPRM and as summarized in this final rule in the light-sport and general aviation safety rationales, the drivers for this rule are improving the safety of the light-sport category and of general aviation more broadly. For example, EAB aircraft may already be built with retractable landing gear, multiple engines, FADECs, variable pitch propellers, and other "complex" systems. This rule seeks to make systems available on light-sport category aircraft that correlate with lower fatal accident rates and meet FAA-accepted design, production, and airworthiness standards. FAA intends for these safety improvements to make these aircraft a more appealing alternative to EAB aircraft. Regardless, FAA notes that part 22 rules do not mandate installation of complex systems such as multiple engines, variable pitch propellers, retractable landing gear, and such. Such configurations and systems have higher initial and recurring costs and, as in the EAB aircraft fleet, will not likely represent the majority of configurations. See section IV.K.1.a. for discussion of aerial work with light-sport category aircraft.

Some individual commenters expressed general opposition to changes to the 2004 final rule. As described in the NPRM, FAA views successes with the light-sport sector as

the basis for further amendments to improve safety and to give the public more options and privileges. FAA notes that many of the basic certification requirements and procedures of the original rules are unchanged, such as issuance of a special airworthiness certificate to a light-sport category aircraft based on a manufacturer's statement of compliance and issuance of a sport pilot certificate based on compliance with subpart J of part 61.

One commenter asserted that though the NPRM frequently referred to the safety continuum concept as supporting rationale for its proposals, analytical substance is lacking to support the conclusion that the safety continuum is satisfied. In both the NPRM and the final rule, the safety continuum concept was applied by comparing and analyzing 14 CFR requirements among different types and levels of certification. For aircraft certification, FAA compared requirements among experimental, light-sport category, primary category, and normal category aircraft. For pilot certification, FAA compared training requirements commensurate to the certificate privileges and limitations among sport, recreational, and private pilots. Per the safety continuum concept, the exposure of the public to risk should correspond with the rigor of the related certificate. For an aircraft, exposure of the public concerns passengers aboard the aircraft, proximity to other aircraft, and populations on the ground. For aircraft that allow a higher exposure of the public, those aircraft should be subject to more rigorous certification requirements. That is, the safety continuum primarily focuses on relative comparisons of regulatory requirements for analysis and appropriate alignment of corresponding requirements. That is why FAA included a safety continuum view of the MOSAIC rulemaking[11] on the NPRM docket. This document shows a high-level, side-by-side comparison of the experimental, light-sport, and type-certificated sectors for recreational

aircraft that FAA used to help with considerations for this proposal from a safety continuum perspective and a safety continuum view of related pilot rules, including seating/occupant limitations. See section IV.H.1.a for a discussion of the passenger limitation for sport pilots.

One commenter requested clarification of NPRM statements about amateur-built aircraft being lower on the safety continuum than light-sport category aircraft. FAA ranks categories or groups of operations on the safety continuum based on the level of risk to the public. Greater potential risk to the general public requires greater rigor in certification standards and procedures. EAB aircraft have not been found to meet FAA or FAA-accepted design or production standards and therefore present a higher level of risk. FAA mitigates that risk for EAB aircraft by requiring those aircraft to meet operating limitations that reduce the risk to the public. Light-sport category aircraft under this rule are subject to a higher rigor in certification requirements and procedures for design, production, and airworthiness than EAB aircraft. Therefore, light sport category aircraft are higher on the aircraft safety continuum than EAB aircraft and can be operated under less restrictive operating limitations than EAB aircraft. Light sport category aircraft that meet the requirements of this rule can safely perform operations such as flight training and operations over densely populated areas. Light sport category aircraft that meet certain requirements under this final rule may also conduct certain aerial work. Though these operations provide more risk to the public, FAA considers that these operations still reach an appropriate level of overall safety because light-sport category aircraft will be subject to higher rigor in certification requirements and procedures for design, production, and airworthiness than EAB aircraft.

One commenter asserted light-sport category airplanes had lower fatal accident rates than type-certificated aircraft in FAA statistics for 2020 and 2021 and the NPRM incorrectly implies that light-sport category aircraft are less safe than certified, general aviation, or non-commercial planes. FAA disagrees that it misrepresented this data in the NPRM. FAA provided this data on the docket; though the commenter is correct that accident rates were lower in 2020 for light-sport category airplanes, the accident rate for light-sport category airplanes was higher than the accident rate for type-certificated airplanes in 2021.

One commenter asserted this rule decreases safety by allowing larger numbers of less qualified pilots to operate larger numbers of less proven planes. FAA disagrees. The 2004 final rule and the proposed rule included safety arguments concerning the certification of light-sport category aircraft and sport pilots. FAA has determined the requirements of the rule allow for sufficient sport pilot qualifications and sufficient certification of light-sport category aircraft to maintain safety.

ANAC comments that proposed expansions in eligibility for certification of light-sport category aircraft would allow similar, small aircraft to be designed as light-sport, primary, normal, or powered-lift category aircraft. ANAC also comments that, despite similarities in aircraft designs among these categories, certification requirements are unnecessarily dissimilar. For example, consensus standards for light-sport category airplanes are different than for normal category airplanes, and consensus standards are not acceptable means of compliance for normal category rotorcraft. Given industry interest in the benefits of type certification for similar, entry-level, small aircraft such as additional operating privileges and broader access to international markets, ANAC asks

how FAA intends to improve type certification of such aircraft with lighter, more consistent requirements.

FAA notes the NPRM did not propose amendment of requirements for normal or primary category aircraft or powered lift. All regulations, means of compliance, policies, and procedures applicable to issuance of a type certificate for a normal, primary, or powered lift category aircraft are unchanged by this rulemaking. As mentioned by the commenter, type-certificated aircraft retain some advantages over light-sport category aircraft. For example, normal category aircraft have higher operating privileges such as carriage of people and property for compensation and hire, sightseeing, and international air navigation. Also, as mentioned by the commenter, through type validation procedures, type-certificated aircraft have access to international markets that require type certification. FAA considers all future rulemaking priorities such as further amendments of type certification requirements based on a number of factors, including feedback from industry, the public, and its bilateral partners.

TCCA expressed concern that the expansions of the light-sport category works against incentivizing small airplane manufacturers to pursue type certification and decreases new, small, modern type certified airplanes under amendment 64 of part 23[12] and equivalent foreign standards. Since amendment 64 of part 23 took effect on August 30, 2017, FAA has issued two type certificates under that part for passenger airplanes with one to four seats.[13] Given how few two to four seat aircraft have obtained type certificates, FAA believes the opportunity cost of discouraging them is low. This final rule has no impact on design and production of type-certificated airplanes with more than four seats.

FAA notes that manufacturers continue to have freedom to design and produce airplanes with four or less seats in the normal, primary, or light-sport categories in consideration of intended operating privileges, market demands, and international transferability. Because safety must be FAA's top priority, FAA must consider the safety incentives produced by improving the safety of the light-sport category.

D. Separation of Limits for Light-Sport Category Aircraft and Sport Pilots

1. Definition of "Light-Sport Aircraft"

The NPRM proposed removal of the definition of "light-sport aircraft" to enable separation of limits for light-sport category aircraft and sport pilots as discussed in the next section, section IV.D.2. Accordingly, the NPRM proposed moving eligibility requirements for certification of light-sport category aircraft, experimental light-sport category aircraft, sport pilots, and repairmen (light-sport) to the applicable 14 CFR parts. FAA received 8 comments related to this proposal from 5 industry associations and 3 individuals. All comments supported this proposed change.

GAMA, AOPA, EAA, NATA, and NBAA commented in favor of removing the light-sport aircraft definition and incorporating relevant language in part 22. These commenters noted the difficulty in obtaining exemptions from parameters established by a definition.

One commenter recommended renaming the defined term "light-sport aircraft," to "Sport Pilot Eligible" aircraft. However, the NPRM specifically eliminates this definition in favor of establishing separate and different limits for an aircraft that may be certificated in the light-sport category and for aircraft that may be operated by a sport pilot. Retaining and renaming the title of the definition as recommended by the

commenter would confuse and undermine a fundamental proposal in this rule that is discussed in section IV.D.1. Therefore, FAA is not adopting this recommendation.

This final rule adopts the proposal to remove the definition of "light-sport aircraft" and replace it with separate eligibility requirements for certification of light-sport category aircraft, experimental light-sport category aircraft, sport pilots, and repairmen (light-sport) in the applicable 14 CFR parts.

2. Elimination of the Definition of "Light-Sport Aircraft" Enables Separation of Limits for Light-Sport Category Aircraft and Sport Pilots

Eliminating the definition of "Light-sport aircraft" from § 1.1 enables FAA to establish separate limits for new light-sport category aircraft and for sport pilots. Understanding this concept is helpful to understand provisions of this final rule discussed in sections IV.F concerning certification of light-sport category aircraft and in IV.H concerning limits for sport pilots.

Since 2004, the § 1.1 light-sport aircraft definition has defined the design and performance requirements for light-sport aircraft as well as the aircraft design and performance limits for sport pilot certificate privileges. The definition was uniquely structured to not only provide the design and performance criteria of light-sport category aircraft, but it also specified the design and performance criteria for other categories and types of aircraft to determine which aircraft a sport pilot could act as the pilot in command (PIC).[14] Simply put, this structure allowed EAB aircraft and normal and primary category aircraft to be light-sport aircraft for the purpose of sport pilot privileges if they met the design and performance requirements within the light-sport aircraft definition. The definition also included other requirements such as for the design of

gyroplane rotor blade systems, even though gyroplanes are prohibited from being certificated as light-sport category aircraft.[15]

The light-sport aircraft definition included maximum takeoff weights for land and water-based operations and maximum airspeeds for V_H, V_{NE}, and V_{S1}. Other design limitations in the definition specified maximum seating capacity, engine, propeller, and rotor requirements, as well as cabin pressurization and landing gear requirements.

Starting [INSERT DATE 90 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER], new aircraft performance limits and design requirements in § 61.316 of this rule go into effect, which will replace the performance limits and design requirements in the light-sport aircraft definition for which aircraft sport pilots may operate. However, the design and performance requirements in the light-sport aircraft definition will continue to be applied for airworthiness certification of light-sport category aircraft under § 21.190. Then, on [INSERT DATE 365 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER], the light-sport aircraft definition is removed from part 1 and new aircraft design and performance requirements for airworthiness certification in the light-sport category are relocated to § 22.100.

The removal of these requirements from the § 1.1 definition and separation of pilot and aircraft requirements is beneficial for several reasons. Separating aircraft design and performance requirements of light-sport category and sport pilot certification more easily allows regulations to be developed that meet the specific needs of aircraft and pilots. For example, while the NPRM initially proposed the same stall speed for both light-sport category airplanes and sport pilots, for this final rule FAA recognized that the different purposes for these limits could result in different stall speed limits. Based on the comments received and the specific needs of aircraft and pilots, FAA determined

different stall speed requirements are appropriate for the final rule. The basis for these different stall speeds is discussed in detail in this final rule in sections IV.F.6.b and IV.H.1.c.

Separate limits allow certification requirements for light-sport category aircraft to be established without regard to a specific grade of pilot certificate as is true for other aircraft categories. Under this rule, light-sport category aircraft are intended for operation by all grades of pilots. That is, sport pilots will no longer be restricted to operation of light-sport aircraft (or light-sport category aircraft under this final rule); part 61 will set forth design and performance limits that correspond to the scope of training and operational limits of sport pilots. Instead, the aircraft design and performance expansions in this final rule allow light-sport category aircraft to achieve greater performance and utility that is equivalent to four-seat normal and primary category aircraft as well as EAB aircraft. The result will make light-sport category aircraft performance more desirable to the other 490,470 certificated pilots (non-student)[16] with greater training and operational experience. This approach also eliminates complications for obtaining exemptions from regulations that are tied to both aircraft and pilot requirements.

E. Special Airworthiness Certificates for Light-Sport Category Aircraft

1. Application Documentation (§ 21.190(c))

Per § 21.190(c) in this final rule, an applicant for a special airworthiness certificate in the light-sport category must provide FAA with a manufacturer's statement of compliance (SOC) and a pilot's operating handbook (POH). The POH includes operating instructions and limitations, a flight training supplement, a listing of any authorized aerial work operations, and any instructions or limitations necessary to safely conduct towing operations. The POH in this final rule replaces the current § 21.190(b)(1)

aircraft operating instructions (AOI) requirement. In addition, an applicant must provide a maintenance and inspection program for the aircraft. Since this final rule makes compliance with part 36 for new light-sport category aircraft voluntary (see section IV.N), this final rule also includes conforming amendments to § 21.190(c). Those conforming amendments eliminate the proposed application requirements to include a statement in the POH regarding compliance with part 36 and submission of evidence that the aircraft has demonstrated compliance with the applicable requirements of part 36 of this chapter.

GAMA recommended that the manufacturer's SOC, POH, and maintenance and inspection program be prescribed in subpart B of part 22. FAA disagrees with prescribing these documents in part 22 because they are already required in § 21.190(c) as part of the special airworthiness certificate application process. The SOC requirements are listed in § 21.190(d) and are the foundation of the light-sport category airworthiness certification process. FAA does not favor adding requirements for the POH and the maintenance and inspection program in part 22 because they are not FAA-approved or accepted documents, unlike the documentation requirements for type certificated aircraft meeting the airworthiness standards of parts 23, 25, 27, or 29. Part 22 also differs from the airworthiness standards for type certificated aircraft in that part 22 covers a wide variety of aircraft classes whereas the parts for type certificated aircraft are specific to airplanes or rotorcraft. This would make adding POH and maintenance program documentation requirements to part 22 difficult because they could not be tailored to meet the specific needs of each class of aircraft.

2. Pilot's Operating Handbook (§ 21.190(c)(2))

Streamline Designs suggested revised language for § 21.190(c)(2)(i) so that the provision reflects industry best practices and addresses normal and emergency procedures. FAA agrees to revise this sentence to capture elements discussed in the NPRM. As such, FAA will remove "recommended" and add "normal" and "emergency" to this requirement. "Recommended" is being removed because it may result in confusion over the intended outcome of the operating instructions and limitations or appear as limiting. Certain operating instructions and limitations in the manufacturer's POH need to be complied with to prevent death, injury, or damage to the aircraft and should not be thought of as "recommendations." Examples of these include certain airspeeds such as V_A and operating instructions such as warnings, cautions, and emergency procedures. "Normal" and "emergency" have been included in this requirement to provide clarity, reflect the NPRM preamble discussion, and expand the requirement beyond just abnormal procedures. In the NPRM, FAA stated the operating instructions should address normal, abnormal, and emergency operating procedures. Accordingly, the final rule revises § 21.190(c)(2)(i) to read, "Operating instructions and limitations to safely accommodate all environmental conditions and normal, abnormal, and emergency procedures likely to be encountered in the aircraft's intended operations."

Streamline Designs also commented on § 21.190(c)(2)(ii) stating that "all foreseeable conditions" could be problematic as it is too open-ended. FAA agrees and has changed "all foreseeable conditions" to "all likely conditions." This change will narrow the scope to flight training conditions that are likely or probable, based on the aircraft and its flight envelope, instead of hypothetical scenarios whose occurrence may be unrealistic, inconsequential, or difficult to predict. Accordingly, § 21.190(c)(2)(ii) has

been changed to read, “A flight training supplement to enable safe operation of the aircraft within the intended flight envelope under all likely conditions.”

Jump Aero recommended that the POH include all necessary procedures for pilots to mitigate likely failures. Reliable Robotics similarly suggested the POH include simplified flight control failure conditions and pilot mitigations to improve § 22.180. FAA notes these recommendations are already captured in the final rule text for § 21.190(c)(2)(i) and (ii) that provides POH requirements as part of the application for a special airworthiness certificate for a light-sport category aircraft.

Streamline Designs recommended § 21.190(c)(2)(iii) include the words “if applicable” so aircraft manufacturers would not have to add a section in their POH just to indicate aerial work does not apply. In the final rule aerial work is authorized, per § 91.327, for light-sport category aircraft certificated on or after [INSERT EFFECTIVE DATE 365 DAYS AFTER PUBLICATION IN THE FEDERAL REGISTER] and § 22.195 requires each light-sport category aircraft to be ground and flight tested to ensure the aircraft can safely conduct any aerial work operation designated by the manufacturer. FAA disagrees with this recommendation. Section 21.190(c)(2)(iii) does not require aircraft manufacturers to state aerial work operations that may not be safely conducted so “if applicable” is not necessary. Instead, FAA encourages consensus standards organizations to consider safety implications of omitting mention of aerial work when creating consensus standards for the POH. Omission of aerial work may be confusing to the operator.

Though not proposed in the NPRM, in response to suggestions from commentors, this final rule includes a requirement for the POH to include any instructions or limitations necessary to safely conduct towing operations in § 21.190(c)(iv). FAA

proposed to authorize limited towing for compensation or hire in the NPRM, but did not include a requirement for the POH. FAA is correcting that omission here. Towing was added to § 21.190(c)(iv) because § 91.327 authorizes limited towing for compensation or hire and towing can put similar loads on aircraft structures as certain aerial work operations.

FAA has already accepted ASTM consensus standards for light-sport category airplane and weight-shift-control aircraft to include manufacturer-provided instructions and operating limitations for the towing of gliders in the aircraft's POH. For example, paragraph A1.7 in the annex of ASTM Standard F2245, Standard Specification for Design and Performance of a Light Sport Airplane, states that operating limitations applicable to towing operations must be established and included in the POH. Also, ASTM Standard F2746, Standard Specification for Pilot's Operating Handbook (POH) for Light Sport Airplane, requires towing instructions be included in the POH. Since light-sport category aircraft manufacturers of towing-eligible aircraft must currently state compliance to FAA-accepted consensus standards for the POH, the addition of towing in § 21.190(c)(iv) is similar to the existing procedures manufacturers already undertake to provide a comprehensive POH.

3. Maintenance and Inspection Program (§ 21.190(c)(3))

A commenter asked if the maintenance and inspection program in § 21.190(c)(3) was accepted or approved. FAA will not accept or approve light-sport category aircraft maintenance and inspection manuals.

4. Evidence of Compliance with Noise Requirements (§ 21.190(c)(2)(iv) and (c)(4))

The NPRM proposed § 21.190(c)(2)(iv) would have required the aircraft manufacturer to provide a statement that the aircraft has demonstrated compliance with

part 36 of this chapter, the tested noise levels of the aircraft, and the following statement: "No determination has been made by FAA that the noise levels of this aircraft are or should be acceptable or unacceptable for operation in any location." Proposed § 21.190(c)(4) would have required the applicant to provide evidence that the aircraft has demonstrated compliance with the applicable requirements of part 36 of this chapter.

Since this final rule makes compliance with part 36 for new light-sport category aircraft voluntary (see section IV.N), this final rule eliminates the proposed requirements in § 21.190(c)(2)(iv) for an applicant to provide the statements, tested noise levels, and the evidence in § 21.190(c)(4) that the aircraft has demonstrated compliance with the applicable requirements of part 36 of this chapter.

FAA received comments from numerous commenters on the proposal to require compliance with part 36. Streamline Designs suggested proposed § 21.190(c)(2)(iv) be reworded so the POH indicates the noise standard to which the aircraft complies instead of an actual tested noise level. Van's Aircraft stated a concern that proposed § 21.190(c)(2)(iv)'s requirement to include "tested noise levels" in the POH would need to be reviewed if a simplified method in consensus standards is approved. Since this final rule makes compliance with part 36 for new light-sport category aircraft voluntary (see section IV.N), these comments are no longer applicable with the omission of proposed § 21.190(c)(2)(iv).

LAMA recommended the part 36 references in proposed § 21.190(c)(2)(iv) and (c)(4) be replaced with "FAA-accepted consensus standards for noise." USUA recommended the elimination of § 21.190(c)(2)(iv) and (c)(4) from the final rule. LAMA and USUA's comments are addressed in section IV.N.

5. Manufacturer's Statement of Compliance (§ 21.190(d))

a. Certified and Trained Authorized Representatives

The NPRM proposed that the manufacturer's statement of compliance require a signature by the manufacturer's authorized representative or agent who is certified and trained on the requirements associated with the issuance of a statement of compliance by an organization that certifies and trains quality assurance staff in accordance with a consensus standard that has been accepted by FAA.

Streamline Designs asked FAA to explain the meaning of "agent." FAA allows agents to submit various FAA documentation on behalf of the owner, such as required for aircraft registration (§ 47.13) or an airworthiness certificate application (§ 21.173). Though FAA does not define "agent," it is generally someone outside of the owner's corporation or business who the owner has authorized to act on its behalf. FAA has determined that the inclusion of "or agent" in the requirement is redundant since an agent is a type of an authorized representative of the manufacturer. Accordingly, FAA has removed "or agent" from § 21.190(d)(1).

ALPA cited FAA's 2010 Light-Sport Aircraft Manufacturers Assessment (LSAMA) Final Report and recommended FAA provide greater regulatory oversight of manufacturers' statements of compliance substantiating that aircraft met consensus standards. Though this final rule does not specifically address FAA oversight of manufacturers' SOCs, it does establish a regulatory framework to address the consensus standards compliance concerns identified in the LSAMA Final Report. In addition to the trained and certified representative specified above to fulfill the § 21.190(d)(1) requirement, § 22.190 requires the aircraft to have been found compliant with the provisions of the applicable FAA-accepted consensus standards by individuals who have been trained on determining compliance with those consensus standards. These two

regulatory requirements will provide better assurance that a manufacturer's staff designs, manufactures, and tests the aircraft to meet the applicable FAA-accepted consensus standards.

FAA oversight of light-sport category aircraft manufacturers and their facilities will be consistent with the safety continuum. Policies and procedures for that oversight, including FAA audits, are included in FAA Order 8130.36, Special Light Sport Aircraft Audit Program, which will be revised to align with changes in this rule. As explained in the NPRM, FAA would expand its oversight to verify successful accomplishment of training by the manufacturer's compliance staff per § 22.190, as well as the training and certification of manufacturer's staff who sign the manufacturer's statements of compliance in § 21.190(d)(1).

b. Manufacturer's Statement Whether an Aircraft is Suitable for Sport Pilots (NRPM proposed § 21.190(d)(3))

The NPRM proposed § 21.190(d)(3), which would have required a statement from the light-sport category aircraft manufacturer as to whether the aircraft met the design and performance requirements specified in proposed § 61.316 for an aircraft that a sport pilot would be permitted to operate. Streamline Designs recommended that this requirement be removed because some light-sport aircraft designs may have features or operation modes that can be toggled on and off and so whether the aircraft meets these requirements may not be a clear yes or no answer.

Because sport pilots may or may not have the necessary endorsements for airplanes designed with controllable pitch propellers or retractable landing gear, FAA agrees there may not be a clear "yes or no" answer to whether certain light-sport category aircraft meet the sport pilot aircraft performance limits and design requirements of

§ 61.316. However, FAA disagrees that the § 61.316 requirements of light-sport category aircraft operated by a sport pilot could be toggled on or off by means of flipping a switch. For instance, changing the type of installed propeller, the type of gyroplane rotor system, or converting a helicopter with simplified flight controls to one with primary flight controls would be impractical to accomplish with a toggle switch or be prevented by design requirements.

Instead, FAA did not include proposed § 21.190(d)(3) in the final rule because sport pilots can fly aircraft with retractable landing gear or controllable pitch propellers if they have obtained an endorsement through the requirements specified in § 61.331. Accordingly, the manufacturer's statement in proposed § 21.190(d)(3) would not have been practical for them to make since sport pilots may or may not be able to fly aircraft with these features. FAA will instead rely on a sport pilot's knowledge of the aircraft and part 61 requirements to determine whether they can fly a certain light-sport category aircraft. With the omission of proposed § 21.190(d)(3), all subsequent proposed sections in § 21.190(d) have been renumbered accordingly in this final rule.

c. Manufacturer's Statement on Towing and Aerial Work Operations (§ 21.190(d)(3))

The NPRM proposed § 21.190(d)(4), which the final rule renumbers to § 21.190(d)(3), to require light-sport category aircraft manufacturers specify aerial work operations they have determined may be safely conducted with the aircraft and state that the aircraft has been ground and flight tested to ensure that it can be operated to safely conduct those operations in accordance with the instructions and limitations provided by the manufacturer.

The Soaring Society of America and Soaring Safety Foundation commented that it is uncertain whether manufactures will consider glider towing operations as included

within aerial work operations. They recommended changes to §§ 21.190, 22.120 and 22.195(d) to clarify glider operations. FAA agrees that § 21.190 and the part 22 sections should be revised to include glider towing operations. Though glider towing is not an aerial work operation per § 91.327(a)(3), it should be included in the applicable requirements of § 21.190 and part 22 since glider and other towing operations puts similar loads on aircraft structures as certain aerial work operations, manufacturers must comply with FAA-accepted consensus standards for their towing-capable aircraft, and manufacturers will have to state compliance to any applicable consensus standards for towing. This topic is further discussed in section IV.K.1.a.iv.b. Accordingly, this final rule adds towing operations to § 21.190(c)(2)(iv) and (d)(3), and §§ 22.110 and 22.195.

The ability for light-sport category aircraft to tow gliders, per § 91.327, has existed since the 2004 final rule. However, because the tow-hitch and installation requirements in § 91.309(a)(2) require Administrator approval, but light-sport category consensus standards for towing have only gained FAA-acceptance, this gap has deterred use of light-sport category aircraft in towing operations. This situation was explained in section IV.H.6 of the NPRM. This final rule resolves this issue with new requirements in § 91.309(a)(2) that allow for Administrator acceptance or approval of a tow-hitch and its installation. This topic is further discussed in section IV.K.1.b.

The annexes in ASTM Standards F2245 and F2317 include FAA-accepted consensus standards for the design and performance of airplanes and weight shift control aircraft that are used to tow gliders. Manufacturers of light-sport category aircraft designed for towing would specify the applicable towing consensus standards on the manufacturer's statement of compliance per § 21.190(d)(5). Since light-sport category aircraft manufacturers must currently state compliance to FAA-accepted consensus

standards for their towing-eligible aircraft, the addition of towing to § 21.190(d)(3) is similar to the existing procedures manufacturers already undertake to complete a manufacturer's statement of compliance.

USUA stated the provisions of proposed § 21.190(d)(4) were unnecessary because aircraft under current consensus standards have already sustained greater loads for glider towing and flight training. FAA disagrees with the association's statement that this requirement is unnecessary. The proposed § 21.190(d)(4) requirement holds manufacturers accountable for designing and constructing their aircraft to withstand the loads of, and safely perform, towing and any aerial work operation they authorize in their aircraft's POH. This requirement also makes the manufacturer state they have flight tested their aircraft and found it able to safely conduct the authorized operations. FAA agrees that glider towing and flight training can put the aircraft under stressful loads; however certain aerial work operations, such as dispensing liquids or helicopter sling loads, have their own unique stressors that need to be addressed in the design. Accordingly, the requirements of proposed § 21.190(d)(4) are in this rule to ensure the safety of towing and aerial work operations authorized by the manufacturer. This final rule will retain § 21.190(d)(4) as proposed, except, as previously discussed, it will include towing operations and be renumbered as § 21.190(d)(3).

d. Manufacturer's Statement on Simplified Flight Controls (§ 21.190(d)(4))

The NPRM proposed that the manufacturer state whether the aircraft meets the simplified flight control requirements of § 22.180. FAA did not receive any comments on this section. This final rule will retain § 21.190(d)(5) as proposed, except, as previously discussed, it will be renumbered as § 21.190(d)(4).

e. Manufacturer's Statement on Specified Consensus Standards (§ 21.190(d)(5))

The existing requirement in § 21.190(c)(2) that the statement of compliance specify the consensus standards used by the light-sport category aircraft manufacturer was retained in proposed § 21.190(d)(6). However, this requirement references subpart B of part 22, which contains the applicable design, production, and airworthiness requirements for which the consensus standards would serve as a means of compliance.

EAA, AOPA, NATA, NBAA, and GAMA recommended that FAA allow in the definition of light-sport aircraft for manufacturers to propose safety enhancing, risk mitigating technologies and designs in lieu of satisfying specific regulatory requirements. FAA disagrees with the associations' recommendation. This final rule removes the light-sport aircraft definition in part 1 and instead has eligibility requirements in § 22.100 that specify certain design, performance, and certification requirements of light-sport category aircraft. As explained in the NPRM, FAA has created the requirements in part 22 for FAA-accepted consensus standards to act as a means of compliance to those requirements. For FAA to accept proposals from individual aircraft manufacturers in lieu of meeting the regulatory requirements would be contrary to the reason why FAA has implemented part 22 in this rule. The associations' proposal would add confusion and undermine industry member participation in, and weaken, the consensus standards and process upon which the light-sport category relies upon for safe aircraft.

Streamline Designs commented that the scope of proposed part 22 and the associated consensus standards is not limited to airworthiness and the language should reflect their actual scope. FAA disagrees that every topic covered by a consensus standard needs to be individually addressed in part 22. This rule will continue to use the overarching terms of design, production, and airworthiness. The performance-based requirements proposed in subpart B of part 22 represent the minimum requirements a

consensus standard would be required to address to be an acceptable means of compliance for certification of light-sport category aircraft.

FAA is making a correction to proposed § 21.190(d)(6) to require that specified consensus standards must be "accepted or approved" by FAA instead of only allowing for FAA "accepted" consensus standards. This revision is to account for § 36.0(c)(1), which the final rule renumbers to § 36.0(b)(1)(i), requiring an FAA "approved" noise consensus standard rather than an FAA "accepted" one. This final rule will retain § 21.190(d)(6) as proposed, except for this correction and, as previously discussed, it will be renumbered as § 21.190(d)(5).

f. Manufacturer's Statement on Quality Assurance System (§ 21.190(d)(6))

The NPRM proposed that the manufacturer state that the aircraft conforms to the manufacturer's design data using the manufacturer's quality assurance system. FAA did not receive any comments on this section. This final rule will retain § 21.190(d)(7) as proposed, except, as previously discussed, it will be renumbered as § 21.190(d)(6).

g. Manufacturer's Statement on Availability of Documents (§ 21.190(d)(7))

Similar to the existing § 21.190(c)(4), the NPRM proposed § 21.190(d)(8), which would require manufacturers to state that they will make the documents specified in § 21.190(c) available to any interested person. Streamline Designs commented the language is problematic because it does not exclude competitors and others from requesting and freely accessing the information and utilizing it in violation of copyright and intellectual property interests. Streamline Designs recommended the requirement be changed to limit documents available to pertinent safety of flight and continued operational safety requests. FAA disagrees with Streamline Designs' requested change. The documents in § 21.190(c) include the manufacturer's statement of compliance, a

POH that includes a flight training supplement, and a maintenance and inspection program. Though these documents are provided to FAA for airworthiness application, they are also provided with the aircraft to the purchaser. These documents should not contain design data beyond what is normally provided in these documents. Manufacturers who alleged violations of copyright and intellectual property interests have due recourse under the law. Since these documents are available to the purchasers when an aircraft is sold, there should be no further restrictions on their dissemination. The availability of these documents to the public is particularly beneficial to prospective purchasers of these aircraft by enhancing their understanding of the aircraft's operation, limitations, and maintenance and inspection procedures before purchase. This final rule will retain § 21.190(d)(8) as proposed, except, as previously discussed, it will be renumbered as § 21.190(d)(7).

h. Manufacturer's Statement on Continued Operational Safety Program and Safety Directives (§ 21.190(d)(8))

The NPRM proposed in § 21.190(d)(9) that the aircraft manufacturer must state that it will support the aircraft by implementing and maintaining a documented continued operational safety program that addresses monitoring and resolving in-service safety of flight issues, includes provisions for the issuance of safety directives, includes a process for notifying FAA and all owners of all safety of flight issues, and includes a process for advance notice to FAA and all owners of a continued operational safety program discontinuance or provider change. The NPRM also proposed in § 21.190(d)(10) that the manufacturer must state it will monitor and correct safety-of-flight issues through the issuance of safety directives and a continued operational safety program that meets the specified consensus standard.

EASA asked for clarity on why proposed § 21.190(d)(9) requires the manufacturer to state it will issue safety directives but in § 91.327 removes the existing requirement for an owner or operator to comply with safety directives. In response, FAA emphasizes that safety directives are an important means for maintaining the safety of a light-sport category aircraft. The aircraft manufacturer issues safety directives to notify owners and future owners of any safety-critical information for their aircraft model. FAA has previously accepted ASTM Standard F3198, Standard Specification for Light-Sport Aircraft Manufacturer's Continued Operational Safety Program, which states that safety directives are issued when a condition is found to exist or could exist in the manufacturer's fleet that may cause an unsafe condition for flight. The removal of the requirement in § 91.327 for owners and operators to comply with safety directives is discussed in section IV.J.1.

The NPRM asked for public comments on whether manufacturers who are discontinuing manufacturing operations should be required to send design information of affected aircraft to FAA prior to discontinuing their continued operational safety program. This action could facilitate FAA's issuance of airworthiness directives if an unsafe condition is discovered after a manufacturer discontinues its operations. GAMA commented that the policy for light-sport category aircraft for the transfer of such data should be similar to the policy applicable to type certificated products. GAMA also requested that FAA keep abandoned design information it takes ownership of confidential unless needed to correct an unsafe airworthiness condition.

FAA has decided against requiring aircraft manufacturers that discontinue operations to provide their design data to FAA. FAA declines to institute this requirement because of challenges with property rights, difficulty reviewing large volumes of data in

different formats, and providing proper storage and retrieval services for the data. In addition, FAA lacks sufficient staff, facilities, and equipment to assume such responsibilities for light-sport category aircraft. FAA encourages aircraft manufacturers to maintain responsibility for their continued operational safety system even if they stopped manufacturing that model of aircraft. FAA also encourages aircraft manufacturers to find a suitable manufacturer or other person that could assume continued operational safety responsibility.

EASA asked if FAA would act as a state of design for non-U.S. manufacturers that discontinue production of aircraft or go out of business. Though a manufacturer discontinuing operations may provide FAA with affected aircraft design data, FAA would not act as a state of design.

EASA also asked about the implications on current bilateral aviation safety agreements of FAA's proposal to remove the requirement for owners and operators of light-sport category aircraft to comply with manufacturer safety directives. The NPRM section IV.H.1 discussed the removal of the requirement to comply with safety directives. The agreements between the United States and individual European countries and with the European Union have no light-sport specific provision or terminology. For example, none of these agreements mention "manufacturer safety directives," a term created for the light-sport rule of 2004. These agreements equate mandatory continuing airworthiness action with issuance of an airworthiness directive. Since § 91.327 provisions for mandatory compliance with airworthiness directives for light-sport category aircraft are unchanged by this final rule, and since these agreements do not use the term, "manufacturer safety directive," this final rule does not impact aviation safety agreements between the United States, the European Union, and any individual European countries.

Streamline Designs stated NPRM proposed § 21.190(d)(9) and (d)(10) overlap and should be merged and simplified. FAA disagrees. To contrast the two in simple terms, proposed (d)(9) requires a manufacturer's statement of a documented continued operational safety program, including provisions for issuing safety directives and proposed (d)(10) requires a manufacturer's statement they will issue safety directives (if necessary) and have a continued operational safety program. Accordingly, because the two requirements are for separate actions by the manufacturer, they will remain as separate requirements.

This final rule will retain § 21.190(d)(9) as proposed, except, as previously discussed, it will be renumbered as § 21.190(d)(8).

i. Manufacturer's Statement on Monitoring and Correcting Safety-of-Flight Issues (§ 21.190(d)(9))

The NPRM proposed § 21.190(d)(10), which would require the manufacturer's statement of compliance to include a statement that it will monitor and correct safety-of-flight issues through the issuance of safety directives and a continued operational safety program. This final rule will retain § 21.190(d)(10) as proposed, except, as previously discussed, it will be renumbered as § 21.190(d)(9).

j. Manufacturer's Statement on Access to Facilities and Data (§ 21.190(d)(10))

The NPRM proposed § 21.190(d)(11) would require the manufacturer to state that, at the request of FAA, the manufacturer will provide unrestricted access to its facilities and to all data necessary to determine compliance with this section or other applicable requirements of this chapter.

Streamline Designs recommended revising this provision to limit such access only to "FAA personnel" and only to the manufacturer's facilities. Streamline Designs

contended that manufacturers should only be required to grant unrestricted access to FAA personnel or personnel it directly contracts with rather than anyone FAA desires. FAA disagrees with Streamline Designs' requested change since the requirement is for the determination of compliance with this section or other applicable requirements of this chapter. For manufacturers with facilities in the United States, FAA would only request that FAA employees or its contractors be allowed to have access to facilities and data to facilitate FAA making a determination of compliance. However, for manufacturers with facilities outside the U.S., FAA would coordinate with the country's civil aviation authority (CAA) and may request its assistance. In this circumstance, a country's CAA may make or assist FAA with the compliance determination.

In addition, FAA disagrees with Streamline Designs because of the omitted requirement for access to data. Access to a facility alone would not result in a compliance determination if the manufacturer did not also allow access to necessary data. The data would show the material and design properties and production methods necessary to determine compliance. The manufacturer's cooperation, including allowing FAA access to data, would also be necessary for the issuance of an airworthiness directive.

This final rule will retain § 21.190(d)(11) as proposed, except, as previously discussed, it will be renumbered as § 21.190(d)(10).

k. Manufacturer's Statement on Quality Assurance Systems (§ 21.190(d)(11))

The NPRM proposed § 21.190(d)(12) required the manufacturer to state it has established and maintains a quality assurance system that meets the requirements of § 22.185 of this chapter. EASA commented that proposed § 21.190(d) and proposed §§ 22.185 and 22.190 contain some overlap of quality assurance system and training requirements. While EASA offered no change or suggestion beyond this observation,

FAA agrees that the training requirements in proposed §§ 21.190(d)(1) and 22.190 and the quality assurance system requirements in proposed §§ 21.190(d)(12) and 22.185 are complimentary. For a quality assurance system to be successful, the design, production, and airworthiness staff members must be trained on determining compliance with applicable FAA-accepted consensus standards. As previously explained, the training requirements were implemented in this rule based on the findings in the LSAMA Final Report. This final rule will retain § 21.190(d)(12) as proposed, except, as previously discussed, it will be renumbered as § 21.190(d)(11).

6. Amended Statement of Compliance for Aerial Work (§ 21.190(e))

The NPRM proposed that an amended statement of compliance would permit aerial work operations, as designated by the manufacturer, for light-sport category aircraft certificated prior to the effective date of § 21.190 in this rule. These aircraft were originally certificated without a provision to conduct aerial work.

A commenter stated all existing light-sport category aircraft should be grandfathered to allow aerial work because it will create an undue time and financial burden on owners and manufacturers, and in some cases be impossible because the aircraft manufacturer has gone out of business. USUA similarly disagreed with this requirement because of the burden on owners and manufacturers. Despite acknowledging in the NPRM that obtaining an amended statement of compliance may be "cost prohibitive," FAA generally disagrees with the commenters. Aircraft manufacturers of light-sport category aircraft certificated prior to [INSERT DATE 365 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER] have not assessed the design and structural integrity of the owner's aircraft or provided corresponding instructions and limitations in the aircraft's operating instructions or POH and

maintenance manual necessary to safely conduct aerial work operations. Without this assessment and information from the original manufacturer, aerial work operations may exceed the safe design loads of aircraft structures.

In completing the amended statement of compliance, the original aircraft manufacturer must reference and reaffirm the statements made in the original statement of compliance and provide a statement that the design and construction of the aircraft provides sufficient structural integrity to enable safe operation of the aircraft during the performance of the specified aerial work operations. In addition, the NPRM proposed that the manufacturer must state that the aircraft is able to withstand any foreseeable flight and ground loads. Consistent with the change of "foreseeable" to "likely" in § 21.190(c)(2)(ii), this final rule has changed "foreseeable" to "likely" in this provision to narrow the scope of conditions that are likely instead of hypothetical scenarios whose occurrence may be unrealistic or inconsequential.

The aircraft manufacturer must specify FAA-accepted consensus standards used to make the determinations of the aircraft having sufficient structural integrity and the ability to withstand any flight and ground loads associated with aerial work operations listed in the POH. For example, the specified consensus standards may be comprised of those for structural integrity and aerial work operations. In addition, the aircraft manufacturer must revise the aircraft's operating instructions or POH to indicate those aerial work operations that may be safely conducted and revise the aircraft's maintenance and inspection program and flight training supplement with necessary instructions in compliance with applicable FAA-accepted consensus standards for these documents.

The final rule will make a correction to the phrase "required by paragraph (a) of this section" by replacing proposed "(a)" with "(e)(4)" so that the manufacturer must

specify FAA-accepted consensus standards used to make the determination that the design and construction of the aircraft provides sufficient structural integrity to enable safe operation of the aircraft during the performance of the specified aerial work operations and that the aircraft is able to withstand any likely flight and ground loads. Paragraph (a) was an incorrect reference since it is about the purpose of § 21.190, which is for the issuance of special airworthiness certificates that meet the requirements of the section.

F. Design, Production, and Airworthiness Requirements for Non-Type Certificated Aircraft

1. Naming of Part 22

Van's Aircraft recommended revising the name of part 22 to eliminate the words "Design, Production and," noting that § 21.190 and parts 23, 25, and 27 do not use these words. FAA disagrees with Van's Aircraft's recommendation because the terms "design" and "production" accurately describe some of the requirements within part 22. FAA created the part 22 name, "Design, Production, and Airworthiness Requirements for Non-Type Certificated Aircraft," to avoid confusion with the term "standards." While parts 23, 25, 27, 29, 31, 33, and 35 use the term "airworthiness standards" in their titles, FAA was reluctant to follow this pattern with part 22 because subpart B contains requirements for which consensus standards would act as the means of compliance. To avoid confusion and ensure the proper hierarchy of airworthiness and consensus standards, FAA used a different naming scheme for part 22. Thus, part 22 uses the term "requirements" instead of "standards." Also, the term "airworthiness" is used several times § 21.190 when referring to special airworthiness certificates for the light-sport category. Contrary to

Van's Aircraft's comment, § 21.190(d)(5) includes the phrase "design, production, and airworthiness" when referring to the requirements of subpart B of part 22.

EASA also commented that the use of part 22 in this rule may create confusion since EASA has used this identification number for CS-22, Certification Specifications, Acceptable Means of Compliance and Guidance Material for Sailplanes and Powered Sailplanes. Similarly, AEA/ARSA objected to the creation of part 22 as written. They stated limiting part 22 to only non-type certificated aircraft will create unnecessary confusion throughout the global aviation industry. Instead, they stated it should cover all aircraft, including sailplanes and primary category aircraft, not addressed by existing certification standards.

While FAA supports global regulatory harmony with other civil aviation authorities, the decision to create part 22 for the design, production, and airworthiness of non-type certificated aircraft was based on several factors. First, FAA does not believe it would be appropriate to include the performance-based design, production, and airworthiness requirements in part 21 as that part is largely limited to prescribing certification procedures, not certification requirements. Second, FAA did not want to embed certification requirements for non-type certificated aircraft between 14 CFR parts dedicated to type certificated products or articles. Thus, creating part 22 for this rule was a logical destination based on existing 14 CFR structure where more rigorous airworthiness standards began with part 23 and continue higher. Finally, instead of designating a specific 14 CFR part to gliders, since 1987 FAA has designated type-certificated gliders as a special class of aircraft in § 21.17. FAA has used the applicable airworthiness requirements contained in parts 23, 25, 27, 29, 31, 33, and 35 found by FAA to be appropriate for the aircraft and applicable to a specific type design, or such

airworthiness criteria as FAA may find provide an equivalent level of safety to those parts. FAA has also accepted requirements in EASA's CS-22 for the type certification of gliders.

2. Applicability (§ 22.1)

FAA made a correction to § 22.1(a) and removed proposed "applying for an airworthiness certificate" since it is redundant with "for the issue of special airworthiness certificates." The removal of "applying for an airworthiness certificate" does not affect or change the meaning of § 22.1(a). This section will now read, "Except as provided in (c), this part prescribes design, production, and airworthiness requirements for the issue of special airworthiness certificates, and changes to those certificates, for non-type certificated aircraft."

The NPRM proposed in § 22.1(c) that part 22 did not apply to aircraft issued an experimental airworthiness certificate, aircraft operating under a special flight permit, or unmanned aircraft. AEA/ARSA asked about the applicability of part 22 design and performance standards to special-light-sport and experimental-light-sport aircraft. Upon further consideration, FAA realizes that an exception should have been added to § 22.1(c) for light-sport category kit-built aircraft. When these kit aircraft receive their experimental airworthiness certificate, they had been designed and produced to meet applicable part 22 requirements just like the certificated light-sport category aircraft their design is based on. Kit aircraft certificated for the experimental purpose of operating light-sport category kit-built aircraft, § 21.191(k), are subject to applicable part 22 requirements for the design and production of the aircraft on and after [INSERT EFFECTIVE DATE 365 DAYS AFTER FINAL RULE PUBLISHED IN THE FEDERAL REGISTER] and the final rule includes a correction to address this situation.

Accordingly, in this final rule § 22.1(c) will read, "This part does not apply to: (i) aircraft issued an experimental airworthiness certificate, except for light-sport category kit-built aircraft; (ii) aircraft operating under a special flight permit; or (iii) unmanned aircraft." The correction does not impact or change the airworthiness certification requirements of light-sport category kit-built aircraft in §§ 21.191 and 21.193 in this final rule. Special-light sport aircraft is a colloquial term for light-sport category aircraft certificated under § 21.190. As indicated in the title of part 22, this part applies to light-sport category aircraft.

A manufacturer's statement of compliance accompanies each light-sport category kit-built aircraft and identifies the manufacturer's compliance with applicable FAA-accepted consensus standards. Certain FAA-accepted consensus standards, such as those for production acceptance as required by § 22.195, will not be included on the SOC since the manufacturer did not assemble or test fly the kit aircraft. Because the kits are built by amateur-builders or with the help of builder-assist companies, the kits must be certificated for the experimental purpose.

FAA did not include experimental aircraft certificated for the § 21.191(l) purpose of operating former light-sport category aircraft in the § 22.1(c) exception because these aircraft could have been altered from their former light-sport category configuration prior to being issued the § 21.191(l) experimental airworthiness certificate. For instance, the alteration could have occurred while the aircraft was operating under an experimental airworthiness certificate for the purpose of research and development or exhibition. The modification would likely cause the aircraft design to no longer comply with FAA-accepted consensus standards in effect when the aircraft was originally certificated in the light-sport category.

AEA/ARSA also asked whether part 22 would apply to non-type certificated unmanned aircraft. The NPRM stated part 22 would not be applicable to unmanned aircraft as the proposed requirements would not be appropriate to address the design of an aircraft that could be remotely operated. In this final rule, part 22 does not include any proposed requirements for telemetry, remote control stations, or other launch or recovery equipment unique to unmanned aircraft. The NPRM noted the requirements for non-type certificated unmanned aircraft could be proposed at a later date.

A commenter recommended that new performance-based aerial work and noise requirements only apply to higher performance aircraft with a V_{S1} above 45 knots. FAA disagrees with the commenter since light-sport category airplanes and gliders are the only aircraft classes with a stall speed limit more than 45 knots CAS V_{S1}. Rotorcraft and powered-lift are also high-performance aircraft, but they do not have a stall speed limit. In this final rule, all light-sport category aircraft classes must meet the part 22 requirements, as applicable. As explained in the NPRM, the proposed expansion of the classes of aircraft eligible for certification under the proposal and the increase in the size and performance of these aircraft requires the adoption and use of more detailed performance-based requirements. Regarding aerial work being only applicable to aircraft with a V_{S1} greater than 45 knots, the commenter's position is overly restrictive as light-sport category aircraft classes other than airplanes and gliders can also do commercial operations. These other classes include rotorcraft (helicopters and gyroplanes), powered-lift, and lighter-than-air aircraft (airships and balloons). The commenter's statement regarding noise no longer applies since this final rule makes compliance with part 36 voluntary for new light-sport category aircraft (see section IV.N).

This final rule adopts § 22.1 as proposed, except for the correction and § 22.1(c) changes discussed above.

3. Eligibility (§ 22.100)

EASA and GAMA commented that it is unclear if the subpart A requirements would also apply to aircraft manufactured outside the United States. FAA agrees and has made a few corrections to § 22.100(a) and (b) to provide clarity that all aircraft, whether manufactured inside or outside the United States, are subject to the applicability requirements in subpart A and the eligibility requirements in subpart B of part 22. The proposed title of § 22.100(a), which stated, "Aircraft manufactured in the United States," has been removed. FAA realized that this title was misleading since it would have made it seem like aircraft manufactured outside the United States were excluded from being subject to § 22.100(a) eligibility requirements. In § 22.100(b), the proposed title "Aircraft manufactured outside the United States" has also been removed. Since the first sentence of § 22.100(b) begins with "For aircraft manufactured outside the United States," the title was unnecessary. The proposed language in § 22.100(b) that stated, "to be eligible for a special airworthiness certificate in the light-sport category under § 21.190 of this chapter" was also removed since it repeats what is stated at the beginning of § 22.100(a), making the language redundant. Finally, "also" was added to § 22.100(b) to make it clear that an applicant of an aircraft manufactured outside the United States must also provide FAA with evidence it meets the requirements of § 22.100(b) in addition to meeting the requirements of § 22.100(a).

In addition, FAA removed proposed § 22.100(b)(1) from this rule since it only required aircraft manufactured outside the United States to meet the requirements of subpart B of part 22. Deleting this proposal clarifies that aircraft manufactured outside

the United States are subject to both subparts A and B of part 22. This final rule renumbers NPRM proposed § 22.100(b)(2) and (3) as (1) and (2), respectively.

Another commenter stated light-sport category aircraft should continue to be designed for sport pilots and should not increase the complexity of current light-sport aircraft. FAA disagrees. Section III.1 of the 2004 final rule acknowledged that time and experience will determine whether the rules require modification. Prior to initiating this rule, FAA consulted with industry members and listened to their recommendations for change. Based on this feedback and supporting accident data in FAA's annual Continued Operational Safety Report[17] for light-sport category aircraft, FAA determined that changes to the design and performance of light-sport category aircraft were warranted. The separation of light-sport category aircraft design and performance limits in part 22 from those tailored for sport pilots in part 61 aligns with the regulatory structure of every aircraft category. This structure allows regulations to be developed that meet the specific needs of aircraft and pilots. Furthermore, given the sport pilot training framework, sport pilots should not be solely dependent upon operating light-sport category aircraft but instead may operate any aircraft, regardless of the airworthiness certificate issued, as long as the aircraft meets the design and performance limitations authorized for sport pilots.

EASA asked if an aircraft with some initial characteristics outside this proposal could be certificated in the light-sport category after a modification to its propeller, stall speed, or other characteristics like mass. The answer would depend on the modifications and whether a standard, primary, restricted, limited, or provisional airworthiness certificate, or an equivalent airworthiness certificate issued by a foreign civil aviation authority had ever been issued for that aircraft. Mass or gross weight is not an eligibility criterion for light-sport category aircraft certificated on or after [INSERT DATE 365

DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]. If an aircraft had previously been issued one of the aforementioned airworthiness certificates, then the aircraft would not be eligible for airworthiness certification in the light-sport category. If the aircraft was newly produced, had never previously been issued one of the listed airworthiness certificates, met the requirements of subpart B of part 22, as applicable, and the applicant could provide the certification requirements specified in § 21.190(c) of this rule, then the aircraft could be issued an airworthiness certificate in the light-sport category. Note that subpart B requires that the aircraft must have met the design, production, and airworthiness requirements specified in subpart B using a means of compliance consisting of consensus standards accepted by FAA. Thus, if the aircraft was designed or manufactured prior to FAA acceptance of consensus standards that act as a means of compliance to part 22 requirements, then the aircraft manufacturer would have to be able and willing to sign a statement of compliance that the aircraft complies with the applicable FAA-accepted consensus standards for a light-sport category aircraft.

a. Eligibility – Class of Aircraft

FAA proposed in the NPRM to allow any class of aircraft to be eligible for certification in the light-sport category under § 21.190, provided the aircraft meets the eligibility criteria in §§ 21.190 and 22.100 and the proposed performance-based requirements in part 22 using an FAA-accepted consensus standard as a means of compliance.

All comments FAA received on this proposal generally supported expansion of the light-sport category to other classes of aircraft. Upwards Aero supported the proposal and moving toward performance-based requirements for light-sport category aircraft. Safari Helicopter commented favorably that the ability to certificate helicopters as light-

sport category aircraft provides potential pilots confidence that their helicopter is built to FAA-approved safety standards. VAI commented about the positive impact of including rotorcraft in the light-sport category. The Gyrocopter Flight Training Academy commented that it was long overdue to include gyroplanes in the light-sport aircraft category.

The response from EAA, AOPA, NATA, and NBAA asserted that the exclusion of gyroplanes from the 2004 final rule was unfortunate, that gyroplanes have continued to be excluded from rulemaking for too long, and recommended broad regulations that relied upon FAA-accepted standards developed by standards organizations. GAMA agreed with removing exclusions based on class from the rule to enable future growth of the light-sport category and new innovations.

Whisper Aero commented supportively that original equipment manufacturers will be on an equal playing field in new aircraft development and that certification consistency will allow for components that are standardized, produced at greater volumes, more affordable, and higher quality.

On or after [INSERT DATE 365 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER], this final rule allows any class of aircraft to be eligible for certification in the light-sport category, provided the aircraft meets the performance-based requirements of part 22 and the eligibility criteria in §§ 21.190 and 22.100. FAA encourages industry to develop acceptable and appropriate consensus standards to comply with the performance-based requirements in part 22 for all classes of aircraft.

b. Eligibility – Removal of Weight Limitations

Until [INSERT DATE 365 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER], light-sport category aircraft will continue to be certificated

based on a maximum takeoff weight in § 1.1 of not more than 1,320 pounds (600 kilograms) for aircraft not intended for operation on water or 1,430 pounds (650 kilograms) for an aircraft intended for operation on water. Though this rule does not contain weight limits for light-sport category aircraft certificated on or after [INSERT DATE 365 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER], light-sport category aircraft certificated prior to [INSERT DATE 365 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER] will continue to be subject to these weight limits under § 21.181(a)(3)(iv)(A).

In the NPRM, FAA proposed to remove maximum takeoff weight restrictions for light-sport category aircraft citing many benefits such as enabling manufacturers to include more safety-enhancing designs and equipment. Instead of a maximum takeoff weight restriction, FAA proposed a stall speed for light-sport category airplanes, gliders, and weight-shift-control aircraft and determined that maximum seating capacity and limited aerial work operations would also help to reasonably constrain size and weight.

ANAC disagreed with the removal of the weight limit and recommended FAA retain the maximum takeoff limit of up to 1,320 pounds for gliders and weight-shift-control aircraft. ANAC also questioned whether allowing heavier gliders and weight-shift-control aircraft would adversely affect safety. FAA disagrees that allowing heavier aircraft weight alone decreases safety. Though glider and weight-shift-control designs generally try to minimize weight, if the design of a glider or weight-shift-control aircraft accounts for the aircraft weight by providing the necessary aerodynamic performance and structural support, safety should not be adversely affected. FAA analyzed weight-shift-control aircraft accident data dating back to 2004 from the National Transportation Safety Board (NTSB) and noted none of the occurrence categories were attributed to a weight-

related reason. For light-sport category gliders, there have been two fatal accidents since 2004, which occurred during the initial climb and post-impact flight phases.[18]

Otherwise, FAA received overwhelming support in the public comments for removal of the maximum takeoff weight restriction. The largest number of commenters on this topic stated the removal of the weight restriction would benefit aircraft designs, handling, and the inclusion of safety equipment. For example, GAMA stated existing light-sport category aircraft weight restrictions inhibit the ability to include many design and safety features and make more robust airplanes. Van's Aircraft also noted the positive effect of eliminating weight restrictions on the ability to develop electric aircraft due to the weight of batteries.

Many commenters stated the weight restriction resulted in handling challenges during airplane landings with gusty winds due to light wing loading. For example, one commenter wrote that eliminating weight limits allows for higher wing loadings and therefore easier to fly aircraft. The comments from GAMA, EAA, AOPA, NATA, NBAA, and the Gyrocopter Flight Academy noted handling or flying challenges caused by light wing loading resulting from the current light-sport category weight restriction. Safari Helicopter noted safety, stronger airframe, and turbulence and wind resistance benefits of higher weight limits.

A few commenters told of unsafe situations they had witnessed due to the existing maximum takeoff weight restriction on light-sport category aircraft. The Gyrocopter Flight Training Academy alleged the potential for manufacturers to cut corners, citing several examples it had witnessed, which could in turn reduce aircraft structural integrity. Another commenter alleged rampant, irresponsible flying of light-sport category aircraft at well above gross weight as a potential safety danger and asserted that eliminating

weight limits will hopefully address this issue by allowing aircraft to be built more robustly and with more useful loads.

These allegations are very concerning to FAA. For light-sport category aircraft certificated prior to [INSERT DATE 365 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER], non-compliance with a light-sport aircraft definition requirement would disqualify an aircraft from being certificated in the light-sport category unless an exemption was obtained. “Cutting corners” on manufacturing materials or processes to save weight would potentially endanger safety, likely be a violation of the manufacturer’s statement of compliance, and resultingly invalidate airworthiness certification of the aircraft in the light-sport category. Per the recent FAA Prohibition on Falsification final rule, a fraudulent or intentionally false statement, an incorrect statement or omission of fact, or other fraudulent activities involving certain documents, such as a manufacturer’s statement of compliance, would serve as the basis for FAA to take certificate action that could include denying, suspending, revoking, or other appropriate action. Manufacturers of part 22 compliant light-sport category aircraft will not be subject to a weight limit, which should alleviate future concerns as those raised by the commenters.

Other commenters favored removal of the maximum takeoff weight restriction for a variety of reasons. These commenters identified benefits to pilot or flight training, building stronger, safer, or more rugged aircraft, enabling the carriage of more cargo, passengers, or fuel, and increasing safety margins.

Several commenters cited occupant weight as a reason why the maximum takeoff weight limit should be removed. One commenter stated an increased weight allowance is more realistic and will improve safety given heavier individuals, luggage, and a desire for

extra fuel for wind or weather purposes. Another commenter noted challenges in accommodating themselves, fuel, and a designated pilot examiner given weight limits. EASA, AOPA, NATA, NBAA, and GAMA commented that the weight restriction has caused numerous unintended consequences including concerns about minimal useful load and resulting pilot and passenger size limitations. Finally, another commenter favored weight limits that would allow two full sized adults.

Many commenters cited that the removal of a weight restriction in this rule would allow many popular recreational and training airplane models to be certificated in the light-sport category. One commenter stated that the new proposal would better enable sport pilots to get a biennial flight review. As discussed in greater detail in the stall speed section (§ 22.100(a)(3)), this rule would continue to restrict aircraft that have been previously certificated in the normal or primary categories from being issued an airworthiness certificate in the light-sport category. Owners of kit aircraft holding an experimental airworthiness certificate for the purpose of operating an amateur-built aircraft also would not be able to subsequently have their aircraft certificated in the light-sport category. However, manufacturers of normal or primary category aircraft, or aircraft models commonly sold as kits, could certificate new aircraft in the light-sport category if those aircraft or kits were built by the manufacturer and meet the requirements of § 21.190 and the light-sport aircraft definition or part 22, as applicable.

Many commenters acknowledged that the current weight restriction is not ideal due to the light wing loading, safety equipment sacrifices made by manufacturers, and reduced fuel carried by operators to operate under maximum takeoff weight. Despite these considerations, FAA agrees with a commenter who stated current light-sport

category aircraft designs are fine when flying within their design envelopes and have not been shown to be deficient or easily fail under current loads.

FAA received several recommendations for establishing a maximum takeoff weight limit for light-sport category airplanes, mostly from commenters that preferred a weight limit rather than a stall speed limit. These recommendations ranged from a high of 6,000 pounds, based on previously applicable BasicMed operations, to a low of 1,080 pounds, proposed by AEA/ARSA as aligning with the empty weight of a Cessna model 152, with the majority of the commenters favoring 3,000 pounds as the maximum takeoff weight limit for this rule.

Though the NPRM clearly stated that a maximum takeoff weight restriction would not be included in this rule, many commenters seemed to be under the misimpression that FAA was indirectly using stall speed to impose a specific weight restriction of 3,000 pounds. Several commenters, including TCCA, recommended setting an explicit weight limit if the stall speed was being used to drive a roughly 3,000-pound weight limit. EASA questioned the background for not setting a direct 3,000-pound limit.

Establishing a stall speed for light-sport category airplanes in this rule will allow aircraft designers greater flexibility than establishing a specific maximum takeoff weight. A reasonable stall speed coupled with other design and performance limitations in this rule, such as a maximum of four seats, a maximum of four occupants, and limited aerial work operations,[19] will likely constrain the size of light-sport category airplanes to a reasonable size for this category. Market forces will also constrain designs to those that are desired by and affordable to the consumer.

In creating this rule, FAA did consider extreme examples, such as the Antonov An-2, which is a single engine biplane that weighs approximately

12,000 pounds, has no published stall speed, and has a maximum speed well under the 250 knot CAS V_H restriction in this rule. FAA believes it unlikely that airplanes like the An-2 will be developed for the light-sport category due to the four seat, four occupant, and aerial work limitations. Because of these restrictions, the marketability of a An-2 type airplane for airworthiness certification in the light-sport category would be significantly diminished.

As discussed in section IV.F.6.b., FAA also weighed commenters' concerns of accommodating electric airplanes in the stall speed decision. Commenters were concerned that a low stall speed allowance would prohibit the development of electric aircraft by limiting their battery size. Batteries add significant weight to electric aircraft and need to be large enough to provide useful range and endurance. FAA considered this feedback in developing the increased airplane stall speed requirement in the final rule.

c. Eligibility – Weight Limit of Powered-Lift and Rotorcraft

Though a stall speed limit would generally constrain the weight of airplanes, it would not have the same effect for powered-lift and rotorcraft since these aircraft classes can hover in place and not stall. In the NPRM, FAA requested comments on appropriate parameters to limit the weight of light-sport category powered-lift and rotorcraft. AIR VEV recommended against using weight as a regulatory limitation but instead allow industry to develop consensus standards to address this matter. FAA disagrees with allowing industry to develop consensus standards to establish eligibility criteria and FAA will not relinquish this responsibility to consensus standards organizations. This practice is consistent with the certification of normal category airplanes in § 23.2005 and avoids confusion caused by the continual shifting of requirements for applicants.

Commenters recommending a maximum takeoff weight limit proposed a range of weights. One commenter recommended doubling the existing limit to 2,640 pounds, asserting that a higher limit was essential for light-sport category powered-lift. GAMA recommended a 3,375-pound limit for light-sport category powered-lift to accommodate newer designs and features including electric propulsion systems. GAMA recommended a maximum certificated weight threshold of 2,700 pounds for light-sport category rotorcraft. These weight limits are also used with § 21.24 primary category seaplanes and rotorcraft. VAI recommended a 3,000-pound weight limit to facilitate the equipage of safety, avionics, and control systems of powered-lift and rotorcraft. If a weight limit was to be developed, AIR VEV favored 5,000 pounds, noting that current powered-lift design requirements work against the ability to meet the same airplane weight requirements and that 5,000 pounds is lower than the limit for part 27 small rotorcraft. Vertical Aviation Technologies, Cicare USA, and a few individuals stated light-sport category helicopter designs should be subject to a four seat and 3,000-pound limitation. Four commenters stated these parameters for rotorcraft should be the same as that proposed for airplanes, even though this rule did not propose a maximum weight limit for any light-sport category aircraft class. Some commenters favored a 3,000-pound weight for rotorcraft since it would allow for more stability in gusty winds, the inclusion of safety equipment and crashworthy designs, greater fuel load for increased range, and greater utility.

Generally, these recommendations suggested actual weight limits instead of parameters to limit weight as requested by the NPRM and failed to include rationales sufficient to convince FAA that a weight limit should be imposed for rotorcraft and powered-lift, particularly given the rationale provided in the NPRM for not imposing weight limits and the fact that no weight limit is being proposed for light-sport category

airplanes. FAA emphasizes this rule does not impose a maximum weight limit as an eligibility criterion in § 22.100 so the aforementioned benefits of a larger helicopter and powered-lift could be included in light-sport category designs. Regardless of the helicopter or powered-lift weight and as explained in section IV.F.4., this rule will limit light-sport category helicopters and powered-lift to two seats. Instead of imposing a weight limit on rotorcraft and powered-lift in this final rule, the maximum seating capacity of two seats, two occupants, and limited aerial work operations should provide the basis for keeping light-sport category rotorcraft and power-lift at a reasonable size and weight.

ANAC suggested the use of the six-pound per square foot main rotor disc loading and 2,700 pounds weight limitations used for primary category helicopters. FAA considered the six-pound per square foot main rotor disc loading limit for rotorcraft and powered-lift but did not adopt it. The limit may not work well with powered-lift because of the potential for heavier weights in certain designs. Also, this value does not effectively limit the size or weight of a helicopter and could allow overly complex and outsized helicopters that would not be appropriate for the design, production, and airworthiness requirements of the light-sport category. Effectively, without an accompanying weight limit, the main rotor disc loading limit alone would not provide any benefits in limiting weight or size making it no more effective than not imposing a weight limit in this rule. For these reasons, FAA does not favor the use of a disc loading limitation.

Whisper Aero commented that competitive market forces will naturally limit powered-lift gross weights since they are limited to two seats and a heavier aircraft for the same payload will be more expensive and louder. It also opined that a weight limit for

light-sport category powered lift was unnecessary as such aircraft are very weight-sensitive and will become subject to part 36 noise restrictions. FAA agrees. However, this final rule does not mandate compliance with part 36 for light-sport category powered lift. The other reason cited by Whisper Aero, in addition to the limited aerial work operations and two-person occupancy restriction in § 91.327, will reasonably control the weight and size of powered-lift.

To limit the weight of light-sport category helicopters indirectly, Skyryse suggested a limit on the number of engines to a single conventional powerplant or the functional equivalent for electric engines. FAA disagrees with this suggestion since it may limit future development of designs and technologies, and it may also result in more accidents due to underpowered helicopters or lack of redundancy in designs.

FAA received a few comments that assumed gyroplanes were going to be held to a 1,320 pound maximum weight limit. This assumption is incorrect. Another commenter stated gyroplanes should have a higher weight limit just like light-sport category airplanes. Similar to the rationale for powered-lift and helicopters, this rule will not impose a maximum weight limit for gyroplanes. A maximum seating capacity of two seats, two occupants, and limited aerial work operations should provide the basis for a reasonably sized light-sport category gyroplane.

d. Eligibility – Weight Limitation of Light-Sport Category Aircraft Certificated Prior to [INSERT DATE 365 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]

For light-sport category aircraft originally certificated prior to [INSERT DATE 365 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER], the requirements in § 21.181(a)(3) of this rule specify that a light-sport category aircraft's

airworthiness certificate will remain effective as long as the aircraft conforms to its original or properly altered configuration, the aircraft has no unsafe condition and is not likely to develop an unsafe condition, and the aircraft meets all of the conditions listed in § 21.181(a)(3)(iv)(A) through (L). The requirements in (A) through (L) are the same as those in the light-sport aircraft definition in effect at the time of certification.[20]

Several commenters stated they would like to see a path for light-sport category aircraft, certificated prior to the effective date of part 22, to increase the maximum takeoff weight above the 1,320- or 1,430-pound restriction in the light-sport aircraft definition. One commenter recommended that the regulations and ASTM provide a path for aircraft with sufficient available data to increase gross weight limits. Another commenter similarly supported existing light-sport category aircraft being able to increase their gross weight, asserting that many such aircraft can handle higher gross weights, and such weight increases would allow for carrying full fuel for increased safety.

This rule does not provide a regulatory provision for light-sport category aircraft, certificated prior to [INSERT DATE 365 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER] to increase the maximum takeoff weight above the 1,320- or 1,430 pound weight restriction in effect at the time of certification. As discussed in section IV.Q, this rule implements a clean break in light-sport category manufacturing and certification requirements upon the implementation of part 22 requirements in this rule. On and after [INSERT DATE 365 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER], light-sport category aircraft will be subject to new design, production, and airworthiness requirements. The existing construct of light-sport category consensus standards will no longer be valid for the production of new aircraft. To not be

subject to a weight limit, an aircraft would have to meet the applicable § 21.190 and part 22 requirements in this final rule and the consensus standards that will be developed to act as a means of compliance to the requirements. The more rigorous requirements in this final rule and associated consensus standards will likely prevent or preclude compliance of existing models certificated prior to [INSERT DATE 365 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]. FAA does note that light-sport category aircraft manufacturers may petition for an exemption to increase the maximum takeoff weight of their existing certificated models and this may be a potential avenue for those that can meet the requirements of the part 11 exemption process.

e. Eligibility – Types of Aircraft Engines and Propellers

The current § 1.1 light-sport aircraft definition limits light-sport aircraft to a single reciprocating engine if the aircraft is powered and a fixed or ground-adjustable propeller if a powered aircraft other than a powered glider. Powered gliders are allowed a fixed or feathering propeller. With the performance expansions in this final rule for the design of light-sport category aircraft, there is no longer a need to restrict light-sport category aircraft to a single reciprocating engine or a fixed or ground-adjustable propeller. Removing these restrictions is necessary for the introduction of powered-lift and certain rotorcraft, e.g., electric vertical takeoff and landing (eVTOL), into the light-sport category. It will also allow for the development of light-sport category twin-engine airplanes that require a feathered propeller for single engine emergency operations. These changes will also enable the development of new technologies, including electric, hydrogen, and hybrid engines and motors. Effective [INSERT DATE 365 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER], with the removal of the light-sport aircraft definition in § 1.1, this final rule will no longer have single

reciprocating engine and propeller limitations for light-sport category aircraft. Section 22.100 will allow light-sport category aircraft to be manufactured with any number and type of engines, motors, or propellers.

Several commenters supported these changes or portions of these changes and only one commenter opposed. The commenter opposed to these changes stated light-sport aircraft are for entry level rather than for high-performance flying and recommended continuing the one engine (or electric motor) and existing propellor restrictions. FAA disagrees with the recommendation. The removal of the restrictions on engines, motors, and propellers is necessary to open the light-sport category to all classes of aircraft and benefit from the development of emerging engine and motor technologies. Under this rule, the designs of light-sport category aircraft will no longer be bound to the training, capabilities, and limitations of sport pilots; effectively making their performance and utility more appealing to a broader range of pilots.

Several commenters supported the removal of the engine restrictions. Pivotal commented on the benefits to aircraft redundancy and aircraft safety of non-reciprocating and multi-engine distributed electric propulsion. Pivotal also commented that the NPRM allowed for manufacturer innovation to realize the advantages of more complex systems and failure mitigation through automation. Whisper Aero commented that removing the single engine requirement enhanced the ability to develop advanced aircraft, noting the prevalence of distributed propulsion in electric powered-lift aircraft. Elanus Aerospace expressed being encouraged by the proposed allowance of electric motors for light-sport category aircraft.

Several commenters encouraged allowing more innovative power systems such as turbine engines, multi-engines, or electrical and hybrid powerplants. Another commenter applauded the move to become propulsion agnostic.

EAA, AOPA, NATA, NBAA, and GAMA strongly supported allowing alternative powerplants since it would allow for innovative propulsion technologies. They also supported controllable pitch propellers being allowed for light-sport category aircraft, noting that electric powerplants and piston engines with forced induction are severely disadvantaged without such propellers.

Sonex commented as to how crucial turbine powerplants were to increased energy efficiency, and how continued development will aid general aviation with shifting away from leaded aviation fuels. It similarly noted how important controllable pitch propellers were to turbine-powered, propeller-driven aircraft.

Finally, EASA asked what propulsion engines could be installed on different types of new light-sport category aircraft and whether such aircraft could use a pressurized cabin for higher altitudes possible with turbine engines, electric hybrid, and other types of propulsion. Upon [INSERT DATE 365 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER], this rule will not prohibit any type or number of engines or motors on light-sport category aircraft. Though turbine engines can operate more efficiently at much higher altitudes compared to reciprocating engines, § 22.100(a)(5) of this final rule requires light-sport category aircraft to have a non-pressurized cabin, if equipped with a cabin. This cabin design requirement remains unchanged from the 2004 final rule.

f. Eligibility – Rotor System for Gyroplanes

Currently, § 21.190 prohibits the issuance of a special airworthiness certificate in the light-sport category to gyroplanes. However, the current § 1.1 light-sport aircraft definition limits gyroplanes to a fixed-pitch, semi-rigid, teetering, two-blade rotor system. Under the current regulations, though gyroplanes cannot be certificated in the light-sport category, they are eligible to be flown by sport pilots if they have a fixed-pitch, semi-rigid, teetering, two-blade rotor system.

As proposed in the NPRM, this final rule will allow gyroplanes to be certificated as light-sport category aircraft and will eliminate restrictions on the rotor system designs of these aircraft. This means that on or after the effective date of [INSERT DATE 365 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER], newly manufactured gyroplanes certificated in the light-sport category are not limited to a fixed-pitch, semi-rigid, teetering, two-blade rotor system. Gyroplanes will have to comply with the applicable performance-based requirements in part 22 to be certificated in the light-sport category. Consensus standards that act as the means of compliance to part 22 requirements will have to be developed by consensus standards organizations for light-sport category gyroplanes and gain acceptance by FAA. Section IV.H.1.h. discusses the applicability of gyrocopter rotors for sport pilots.

AutoGyro and an anonymous commenter supported this proposal. FAA did not receive any opposing comments. AutoGyro supported the proposal wholeheartedly, stating that removing this requirement allows for innovative designs. The anonymous commenter applauded the inclusion of designs on gyroplanes, which allow for jump take off systems.

This final rule corrects § 21.181(a)(3)(iv) by removing proposed provision (I) that specified gyroplanes originally certificated prior to [INSERT DATE 365 DAYS AFTER

DATE OF PUBLICATION IN THE FEDERAL REGISTER] had to have a fixed-pitch, semi-rigid, teetering, two-blade rotor system for their special airworthiness certificate in the light-sport category to remain effective. This provision is removed because gyroplanes are prohibited from being issued special airworthiness certificates in the light-sport category. Given this correction, the NPRM proposed provisions § 21.181(a)(3)(iv)(J) through (M) are renumbered as (I) through (L) in the final rule.

g. Eligibility – Types of Landing Gear

Currently, the § 1.1 light-sport aircraft definition requires light-sport aircraft to have fixed landing gear, except for an aircraft intended for operation on water or a glider. Aircraft intended for operations on water may have fixed or retractable landing gear, or a hull. Gliders may have fixed or retractable landing gear.

As proposed in the NPRM, this final rule will eliminate restrictions on the landing gear designs of light-sport category aircraft. This means that on or after [INSERT DATE 365 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER], newly manufactured aircraft certificated in the light-sport category will be allowed to have fixed or retractable landing gear, or floats for aircraft intended for operation on the water. The NPRM proposed removing the landing gear requirements for light-sport category aircraft since the proposed part 22 eligibility requirements were not contingent on a sport pilot operating the aircraft. The proposed rule to eliminate weight limits for light-sport category aircraft also allowed for more robust structures and greater weight allowances, which would accommodate the necessary structural enhancements needed for retractable landing gear.

FAA received support for its landing gear proposal from EAA, AOPA, NATA, NBAA, GAMA, and Sonex. GAMA and a consolidated comment from EAA, AOPA,

NATA, and NBAA stated there is minimal impact on safety of retractable landing gear for airplanes, injury rarely results from “gear up” events, and they anticipate new cockpit technology that would make such occurrences less likely. They also stated while adding complexity, these systems are well-understood and can be safely implemented. Sonex noted previous FAA retractable gear exemptions that did not lessen safety, and that retractable gear aircraft are more energy efficient in cruise flight.

One commenter opposed the proposal, stating that the changes will add complexity, increase failure or pilot error, and would not draw more people to light-sport category aircraft from experimental aircraft. While FAA agrees that the inclusion of retractable landing gear, by itself, will not draw people away from EAB aircraft, the NPRM did not make this claim. Rather, the NPRM stated its proposals to include a wider variety of aircraft, increase performance, and increase operating privileges were intended to increase safety by encouraging aircraft owners deciding between experimental aircraft and light-sport aircraft category to choose aircraft higher on the safety continuum. While retractable landing gear adds some degree of complexity, can malfunction, and may not be extended from time to time during landings, these concerns can be mitigated with proper training and checklist discipline obtained with a complex aircraft endorsement. Also, aircraft manufacturers can mitigate risks with comprehensive inspection and maintenance procedures and designs that include effective alerting systems. FAA encourages consensus standards organizations for light-sport category aircraft to develop consensus standards that address the inspection and maintenance of retractable landing gear and alerting systems that would help to prevent gear-up landings. Based upon the above, FAA disagrees that light-sport category aircraft in this final rule should continue to be subject to the existing landing gear restrictions.

4. Maximum Seating Capacity for Other Light-Sport Category Aircraft (§ 22.100(a)(1))

For light-sport category aircraft classes other than airplanes, FAA proposed to keep the maximum seating capacity of gliders, weight-shift-control aircraft, lighter-than-air aircraft, and powered-parachutes at two seats. The NPRM stated two seats were appropriate for these classes since they are operated for recreation[21] and that additional passengers would increase risk. The additional weight of a third person in certain classes, such as gliders, would be detrimental to operational efficiency and result in cumbersome designs.

As discussed above, AEA/ARSA opposed seat increases for light-sport category aircraft citing that the primary category already provides a pathway for aircraft with a seating capacity of four persons. Of note, the primary category only applies to airplanes and rotorcraft but not weight-shift-control, powered parachute, powered-lift, and lighter-than-air classes. AEA/ARSA's opposition to four seat light-sport category aircraft aligns with the two-seat maximum capacity for light-sport category rotorcraft in this final rule. FAA's response to AEA/ARSA's opposition with respect to four seat light-sport category airplanes is provided in section IV.F.5.

One commenter advocated for increasing the seating capacity of weight-shift-control aircraft to three seats citing that three-seated weight-shift-control trikes already exist and they are just as safe as two-seaters. FAA disagrees with increasing the seating capacity of weight-shift-control aircraft as weight-shift-control aircraft have the highest fatal accident rate of any light-sport category aircraft, dating back to fiscal year 2005 and based on the total fleet size, per FAA's 2022 Continued Operational Safety Report for light-sport category aircraft. FAA is not increasing the seating capacity of weight-shift-

control aircraft in this rule based on the high fatal accident rate for this class, recreational-only operations, and increased risk of additional passengers.

Four commenters, including USUA, recommended increasing the seating capacity of powered parachutes to three. The commenters cited the availability of bigger engines, increased utility and marketability, and that three and four seat trikes and powered parachutes operate outside the United States. A few commenters cited ITEC's Maverick, a four seat off-road powered parachute, which operated in the U.S. under an experimental airworthiness certificate for the purpose of exhibition. Though FAA generally agrees that bigger engines could increase the feasibility of greater seating capacities and that the marketability and utility of powered parachutes could be increased with more seating, FAA does not agree that these enhancements outweigh the risks of three or more passengers being flown on powered parachutes. For example, of the four Maverick powered parachutes built by ITEC, two of them were involved in accidents. Because of limited production of powered-parachutes models with more than two seats, operations predominantly occurring in foreign countries, and authorization being other than in the light-sport category, the FAA could not obtain comprehensive accident data for these models. However, FAA continues to affirm that two seats are appropriate for powered parachutes since powered parachutes are only operated for recreation and additional occupants would increase risk.

FAA received two comments to increase the seating capacity of light-sport category airships. One commenter favored three seats for greater utility or two seats and one stretcher to allow their use in search and rescue or ambulance operations. The other commenter requested up to ten seats to train pilots on platforms similar to the configuration of type-certificated airships. Though FAA generally favors increasing the

utility of aircraft, considering that there were zero light-sport category lighter-than-air aircraft in the FAA Registry per FAA's 2022 Light-Sport Category Aircraft Continued Operational Safety Report, FAA did not increase the seating capacity of lighter-than-air aircraft in this rule.

In the NPRM, FAA proposed that the two new light-sport category classes, powered-lift and rotorcraft, would have a maximum seating capacity of two seats. FAA stated because of the lack of experience with safety metrics associated with powered-lift and rotorcraft classes of light-sport category aircraft, the maximum seating capacity of two seats was appropriate. Unlike light-sport and normal category airplanes, consensus standards for the airworthiness certification of rotorcraft or powered-lift of any category have yet to be accepted by FAA. Since the development of appropriate consensus standards is starting at ground level, this risk will be mitigated with a maximum seating capacity of two seats for rotorcraft and powered-lift in this rule.

AIR VEV and Streamline Designs proposed that the maximum seating capacity limitation be prescribed in FAA-accepted consensus standards. AIR VEV suggested that the consensus standards would initially limit rotorcraft and powered-lift to two seats only and could be modified once the industry and FAA had gained sufficient safety data regarding these types of aircraft. Streamline Designs noted industry consensus standards have included limitations in addition to what the rules require and the same should be done with the maximum seating limit. FAA disagrees with these recommendations. Like the airworthiness standards for other aircraft categories, seating capacity is often used as a regulatory eligibility criterion for airworthiness certification purposes. Though potentially less flexible than consensus standard development, rulemaking would provide FAA an opportunity to propose the regulatory structure of performance-based limitations

and requirements necessary for safe operations of light-sport category rotorcraft and powered-lift with increased seating capacities. As stated in the NPRM, FAA could consider future rulemaking to increase the proposed two seat limitation for these aircraft classes as experience increases and consensus standards are developed. Like all classes of light-sport category aircraft, FAA will monitor the accident rates of rotorcraft and powered-lift and consider this data for future privileges and performance expansions.

Several commenters, including VAI, commented that the maximum seating capacity of helicopters and gyroplanes should be increased to four seats for the same reasons FAA used for airplanes. As discussed above, FAA lacks experience with safety metrics associated with rotorcraft classes of light-sport category aircraft, which includes helicopters and gyroplanes, and could consider future rulemaking to increase the two-seat limitation as experience increases and consensus standards are developed. Other commenters, including EAA, AOPA, NATA, NBAA, 3F, and Streamline Designs, commented that all classes of light-sport category aircraft should have a maximum seating capacity of four seats and USUA recommended that all non-airplane light-sport category aircraft have a three-seat limit. FAA disagrees with these perspectives for the reasons discussed above regarding each individual category of non-airplane light-sport aircraft. In addition, one of the major safety objectives of this rule is to make light-sport category airplanes a more appealing alternative compared to EAB airplanes and dampen the increasing growth into amateur-built airplanes. FAA Registry data shows this safety benefit is more prevalent for airplanes because there are far more EAB airplanes than other aircraft classes. As of November 14, 2024, FAA Registry shows there are 26,453 registered EAB airplanes compared to only 1,162 EAB helicopters, 189 EAB gyroplanes, 285 EAB gliders, 63 EAB weight-shift-control aircraft, and 8 EAB powered-

parachutes. Because this safety benefit is targeted at light-sport category airplanes, FAA determined that increased seating capacity was necessary for light-sport category airplanes, but the benefit did not justify seating increases for other aircraft classes due to lower EAB demand and the other considerations discussed above with regard to each individual category of non-airplane light-sport aircraft.

VAI, Vertical Aviation Technologies, Cicare USA, Skyryse, and several individual commenters recommended increasing light-sport category helicopters maximum seating capacity to four seats. These commenters cited that a larger size to accommodate additional seating would make the helicopter more structurally rugged, perform better in windy or turbulent air conditions, be equipped with additional safety devices and crashworthy features, and have a greater fuel load or battery capacity. Commenters stated larger helicopters have larger rotor systems or more blades, which results in better autorotation performance and reduced noise levels. FAA agrees that these recommendations would increase the marketability, utility, and safety of light-sport category helicopters. FAA believes it is an oversimplification to state that larger rotor systems or more blades results in reduced noise levels, as there are many other considerations needed to arrive at such a conclusion. FAA generally agrees with these arguments as most were used to justify the seating increase of light-sport category airplanes. However, FAA notes this rule will not impose any size or weight limitations on light-sport category helicopters so these performance expansions and benefits of a larger-sized helicopter could be included in light-sport category helicopter designs, even with the two-seat limitation. An individual commenter favored limiting helicopters to two seats with a weight limitation; however, this commenter did not state a recommended weight limitation. As previously stated, this rule will require a two-seat maximum seating

capacity for light-sport category helicopters to mitigate risk while FAA gains experience in safety metrics. Future accident data will need to show the effectiveness of newly developed consensus standards for light-sport category helicopters.

FAA received comments from the Gyrocopter Flight Training Academy, AutoGyro, and several individuals to increase the maximum seating capacity of gyroplanes to either three or four seats. Comments addressed increased utility and market demand and cited gyroplanes with more than two seats operating in other countries. AutoGyro commented that additional seating would allow flight schools to take advantage of the Gemini method of allowing more than one student on board. Though FAA generally agrees with these comments, FAA disagrees with increasing the maximum seating capacity above two seats for gyroplanes primarily because of the increased risk and, as previously stated, the lack of experience with safety metrics for these aircraft. The NPRM stated future rulemaking to increase the proposed two seat limitation for these aircraft classes could be considered as experience increases and consensus standards are developed. Like the other classes of light-sport category aircraft, FAA will monitor the accident rates of gyroplanes and consider this data for future privileges and performance expansions.

Another commenter opposed three or four seat gyroplanes but also challenged some of the NPRM statements regarding gyroplanes and asserted that FAA's two-seat limitation could limit gyroplane commercial applications that are evident in other countries. FAA disagrees with the commenter's challenge to these NPRM statements because the commercial use cases cited by the commenter could be accomplished in a two-seat gyroplane and do not necessitate additional seating, or in the case of the

sightseeing use case would not be permitted as an aerial work operation because it involves the carriage of a non-essential person for compensation or hire.

FAA received one comment to increase the maximum seating capacity of powered-lift. The commenter stated a seat limitation for powered-lift would discourage spending on required resources for the implementation of distributed electric propulsion and simplified vehicle operation technologies that provide increased safety advantages through redundancy and loss of control protection. FAA notes that, regardless of seating capacities for powered-lift, certain technologies like distributed propulsion systems may be necessary for the certification of certain light-sport category powered-lift to show compliance with requirements for control and maneuverability (§ 22.105) and the propulsion system (§ 22.145). FAA also notes the simplified flight controls requirements in § 22.180 are not applicable to all light-sport category aircraft. As previously discussed, this rule will require a two-seat maximum seating capacity for light-sport category powered-lift to mitigate risk while FAA gains experience in safety metrics. Future accident data will need to show the effectiveness of newly developed consensus standards for light-sport category powered-lift.

5. Maximum Seating Capacity for Light-Sport Category Airplanes (§ 22.100(a)(2))

FAA proposed to increase the maximum seating capacity of light-sport category airplanes from two seats to four seats. As explained in the NPRM, the addition of two more seats should increase safety by making manufacturer-built light-sport category airplanes that meet design, production, and airworthiness requirements a more appealing alternative to EAB airplanes. In addition, pilots holding private pilot certificates or higher would likely find light-sport category airplanes with four seats more appealing due to the

greater utility. Attracting more pilots with higher levels of experience and training into light-sport category airplanes increases the overall safety of those operations.

Most commenters favored increasing light-sport category airplane seating capacity from two to four seats. AEA, ARSA, and ALPA opposed the proposed increase in seating. AEA/ARSA stated primary category airplanes already allow four seats. FAA agrees that the primary category is a viable option for manufacturing a four-seat recreational airplane; FAA recognizes that primary and light-sport category airplanes will share similarities of weight and seating capacities as a result of this rule. Accordingly, it would be detrimental to the utility and marketability of light-sport category airplanes to limit them to two seats when they will have the size and performance to carry four people, including the pilot. ALPA asserted that increased seat capacity would reduce the safety benefits of normal category airplanes because significantly more pilots will likely migrate down to light-sport category airplanes. FAA agrees that some pilots may migrate from normal to light-sport category airplanes just as they have migrated from normal to EAB airplanes. Regardless, the performance-based requirements in part 22 will increase safety of light-sport category airplanes since appropriate consensus standards (for an airplane with a maximum of four seats) can be created to act as a means of compliance to those requirements.

FAA notes that a few minor inconsistencies exist regarding seating when comparing normal, primary, and light-sport category airplanes and EAB airplanes. Low speed, level one normal category airplanes have a maximum seating configuration of zero to one passenger and level two normal category airplanes can have a maximum seating configuration that allows up to six passengers.[22] Primary category airplanes are limited to four seats and, like normal category airplanes, are type certificated.[23] Thus, primary and

normal category aircraft share similar airworthiness certification paths since they must show compliance to similar airworthiness requirements. At the low end of the safety continuum, EAB airplanes do not have to meet any airworthiness standards and are not bound to a maximum seating capacity restriction. As of May 13, 2025, only 157 EAB aircraft in the FAA Registry had more than four seats.

Despite the wide array of certification rigor for normal, primary, and light-sport category airplanes and EAB airplanes, FAA considered the seating variances when proposing this rule and determined that a maximum seating capacity of four seats for light-sport category airplanes was reasonable given the expected similarities in size and performance. FAA anticipates that light-sport category airplanes with four seats will share similar dimensions (i.e., wingspan, length) and general configurations as the popular models of the other three types of four-seat airplanes. Likewise, all four types of four-seat airplanes should share similar engine or motor models and operate within a similar performance envelope of altitudes and airspeeds.

A few commenters favored increasing the maximum seating capacity of light-sport category airplanes to more than four seats. One commenter was concerned that a four-seat limit would dissuade families with more than two children from buying light-sport category airplanes and thereby unnecessarily restrict the market. The commenter questioned the difference, referencing the structural ability of the airplane, in carrying the weight of four adults compared to a couple with four children.

FAA agrees that the maximum seating capacity of an airplane plays a large role in its utility and marketability. As previously discussed, FAA evaluated the certification categories at the low end of the safety continuum, including EAB airplanes, to determine the acceptable maximum seating capacity of light-sport category airplanes. As long as an

airplane is operated within its authorized performance envelope and weight and balance limits, the presence of passengers does not necessarily make an airplane less safe. Rather, increasing the seating capacity allows for the carriage of more passengers, which exposes more people to risk. Airplanes that carry more passengers, especially for commercial purposes, should be certificated at increasing levels of rigor because they have the capacity to expose more people to risk. Given where light-sport category airplanes fall on the safety continuum and the seating capacity limits of normal and primary category airplanes, which have a long history of four-seat airplane designs, FAA deems four seats as an appropriate seating limit for light-sport category airplanes.

Another commenter who favored more than four seats asserted that decoupling light-sport category airplanes from sport pilots eliminated the need for a four-seat limit and that the handling, controls, and performance limitations will result in larger airplanes that are safer and simpler than older alternatives. For the reasons previously discussed, FAA disagrees with exceeding the four-seat limit for airplanes in this final rule. Also, the addition of a new light-sport category airplane does not necessarily correlate with the retirement of an older airplane, regardless of the category of that older airplane. As evidenced by the well-documented aging of the general aviation fleet, used aircraft remain appealing to buyers who need or want lower cost or higher certificated options. In addition, the commenter does not provide support for their statement that the handling, controls, and performance limitations of a larger light-sport category airplane will make them safer and simpler than older normal category alternatives. Though this rule aims to increase the safety of light-sport category airplanes and of general aviation by making light-sport category airplanes a more appealing alternative to EAB airplanes, FAA finds

no compelling basis for predicting that the safety of light-sport category airplanes will exceed that of airplane categories higher on the safety continuum.

Another commenter asked whether six-seat airplanes with two seats removed would be acceptable. Section 22.100 specifies that light-sport category airplanes have a maximum seating capacity of not more than four persons, including the pilot. This means an airplane could not be designed with more than four seats and be eligible for light-sport category airworthiness certification under § 21.190. Also note that § 91.327 as adopted in this final rule prohibits persons from operating an aircraft certificated in the light-sport category that carry more than four occupants, including the pilot, if the aircraft is an airplane. Accordingly, even if there were extra floor space in the airplane where additional occupants could fit, § 91.327 prohibits a pilot from carrying more than four occupants, including the pilot.

Many commenters that favored a maximum seating capacity of four seats for light-sport category airplanes cited the increased utility that four seats will provide, including for pilots with private or higher certificates and for training, personal transportation, recreation, and flight school rental. Other commenters favoring the seat increase stated it would make pilot training more efficient since it would allow two students to receive training on the same flight, citing the "Gemini Method" commonly used by flight schools. Under this method, the non-flying student would be able to observe and learn from the instruction provided to the other student. The non-flying student could also increase flight safety by visually clearing for other aircraft and hazards or assisting with emergencies. Van's Aircraft highlighted increased marketability for private aviation and flight schools for such aircraft and the ability for flight schools to fly with more than one student.

One commenter stated the four-seat change would enable more legacy aircraft in the light-sport category and allow additional versatility in future designs. Though FAA agrees that the seat increase will allow more versatility in future designs, the comment about allowing more legacy aircraft to be included in the light-sport category needs clarification. The issuance of a special airworthiness certificate in the light-sport category for airplanes that have been previously issued a standard, primary, restricted, limited, or provisional airworthiness certificate, or an equivalent airworthiness certificate issued by a foreign civil aviation authority is prohibited per § 22.100.

This final rule sets the maximum seating capacity at four seats for light-sport category airplanes. FAA finds that four seats are appropriate for the certification rigor of light-sport category airplanes given their primary use of recreational flight. The increased maximum seating capacity from two seats to four seats provides enhanced utility and marketability of light-sport category airplanes. This enhanced utility and marketability will make light-sport category airplanes a more appealing alternative to EAB airplanes and will help to attract more pilots with higher levels of experience and training into manufacturer-built light-sport category airplanes, thereby increasing safety.

6. Maximum Takeoff Weight and Aircraft Stall Speeds (§ 22.100(a)(3))

a. Maximum Takeoff Weight

Streamline Designs commented that there is no certificated takeoff weight because there is no type certificate. The requirement to use certificated takeoff weight in proposed § 22.100(a)(3) was taken, and is unchanged, from the existing requirement in the definition of light-sport aircraft in § 1.1. The requirement to use certificated takeoff weight in existing § 1.1 and proposed § 22.100(a)(3) was a reference to the maximum takeoff weight tied to the airworthiness certificate and not based upon a type certificate as

light-sport category aircraft are not issued a type certificate. However, given the concerns raised in this comment, FAA recognizes that 'certificated' takeoff weight is not the best terminology to use in this final rule with light-sport category aircraft. As such, this final rule eliminates "certificated" from proposed § 22.100(a)(3) to determine the maximum stalling speed or minimum steady flight speed at the aircraft's maximum takeoff weight. FAA's Airplane Flying Handbook (FAA-H-8083-3C) defines maximum takeoff weight as the maximum allowable weight for takeoff. In addition, ASTM Standard F3060, Standard Terminology for Aircraft, states that maximum takeoff weight is used to determine maximum flight loads and flight requirements and it may also be the weight used to determine the maximum ground loads when it is the same as the ramp weight, landing weight, or towing weight.

The aircraft manufacturer should include the aircraft's actual and maximum weight limits in the POH since they are necessary to conduct safe operations as required by § 21.190(c)(2)(i). As part of the application for an airworthiness certificate in the light-sport category, an applicant provides FAA with the aircraft's POH and FAA Form 8130-15, *Manufacturer's Statement of Compliance for a Light-Sport Category Aircraft/Kit*. This form assists a manufacturer in fulfilling statement of compliance requirements in § 21.190(d) and includes an entry for the manufacturer to specify the aircraft's maximum takeoff weight. The maximum takeoff weight in the POH and on FAA Form 8130-15 should match. Accordingly, this is also the weight that should be used by the manufacturer when conducting flight tests, per § 22.195, such as verifying the applicable stall speed requirement in § 22.100(a)(3).

b. Airplane Stall Speed

FAA proposed in § 22.100(a)(3) a maximum stall speed of 54 knots CAS, without the use of lift-enhancing devices (V_{S1}), at the airplane's maximum certificated takeoff weight and most critical center of gravity. FAA proposed this increased stall speed because on and after [INSERT EFFECTIVE DATE 365 DAYS FROM PUBLICATION IN THE FEDERAL REGISTER], with the removal of the weight limits of the light sport aircraft definition, aircraft have increased weight allowances. Increased weight allowances must be accompanied with an increased stall speed. Since most light-sport category airplane accidents occurred during approach and landings, FAA proposed 54 knot CAS V_{S1} with the goal of reducing kinetic energy in survivable aircraft landing accidents,[24] which would result in fewer occupant injuries and fatalities. FAA also noted 54 knots CAS was the highest V_{S1} for which an exemption had been granted for the light-sport category.[25]

The proposed 54 knot CAS V_{S1} eligibility requirement for light-sport category airplanes received over 120 comments. Over 50 commenters stated the proposed 54 knot CAS V_{S1} should be increased to a higher V_{S1}. These commenters suggested V_{S1} values that ranged from 57 to 65 knots, with the greatest number of commenters supporting an increase to, or at least a minimum of, 58 knots CAS V_{S1}. Some of the commenters wanted V_{S1} to be increased above the proposed 54 knots CAS but did not provide a specific value. Other commenters supported a stall speed increase that used a landing configuration airspeed (V_{S0}). The commenters that favored using V_{S0} suggested values ranging from 48 to 65 knots, with the majority supporting a V_{S0} of 54 knots. Almost half of these commenters did not specify a V_{S0} speed. Some commenters specified a stall speed (V_{S1} or V_{S0}) increase with the inclusion of equipment requirements, operational considerations, design aspects, crashworthiness, or other considerations.

Other commenters said an increased stall speed above the proposed 54 knot limit or even above the current 45 knot limit was unnecessary. One commenter supported the proposed 54 knots CAS V_{S1}, stating it will allow for both adequate safety margin and more robust and safer designs. AEA/ARSA jointly disagreed with increasing the stall speed limit to 54 knots CAS and instead asserted that this rulemaking should instead update rules for the primary category. FAA disagrees that these changes are better suited to primary category. Since 2004, light-sport category aircraft manufacturers have produced over 200 designs and approximately 3,500 aircraft, whereas primary category aircraft manufacturers, since 1992, have produced 53 aircraft and obtained 7 type certificates.[26] The use of consensus standards in the airworthiness certification of light-sport category airplanes has produced successful and safe results as shown by the relatively low accident rate for light-sport category airplanes.[27] FAA considers that it is more efficient to address these safety considerations in the aircraft that are most numerous in the airspace for the general aviation community.

ALPA also did not favor increasing V_{S1} above 45 knots CAS because it would allow significantly heavier and larger aircraft to operate in the light-sport category, which would lower safety. Heavier and larger light-sport category airplanes will be able to operate under the higher stall speed limit in this rule. FAA disagrees that, by itself, an aircraft's heavy weight or large size decreases safety. Heavier weights or larger sizes usually must be coupled with another parameter such as poor design, inadequate power or performance, or poor decision making by the pilot to result in adverse impacts to safety. Conversely, the existing low weight and resultingly low wing loading of light-sport category airplanes is one of the main reasons for their historically high number of landing accidents [28] because low weight and wing loading create challenging handling qualities in

windy or turbulent conditions. Elimination of weight limits in this rule should decrease the number of landing accidents associated with low wing loading.

FAA considered all comments and has decided to increase the maximum stall speed eligibility requirement in § 22.100(a)(3) from the proposed 54 knots CAS V_{S1} to 61 knots CAS V_{S0} for special airworthiness certification of light-sport category airplanes.[29] The 61 knot CAS V_{S0} is a compromise between the proposed stall speed that would provide lower kinetic energy for survivable emergency landings and one that could achieve safe operations of heavier airplanes allowed by this rule, as discussed in the following paragraphs. Though most commenters favored either a 58 knot CAS V_{S1} or a 54 knot CAS V_{S0} or higher, the same safety justification for raising the maximum V_S to any of these values can also be applied to 61 knots CAS V_{S0} with equal validity.

FAA considered stall speed limits of similar types of four-seat general aviation airplanes. Light-sport and primary category airplanes share the same maximum stall speed limit of 61 knots CAS V_{S0}.[30] Normal category and EAB airplanes do not have a maximum stall speed limit despite EAB airplanes not being subject to design standards, unlike normal category airplanes. Increasing this rule's airplane stall speed limit to 61 knots CAS V_{S0} is reasonable considering the design and performance similarities of these types of general aviation airplanes.

A 61 knot V_{S0} stall speed limit has been applicable to the production of four-seat primary category airplanes since September 1992. The 1992 primary category final rule explained that the 61 knot V_{S0} limit was adopted simply based on its 50-year track record in part 23 that "established it as an acceptable level for single-engine airplane performance for safe operation by general aviation pilots."[31] This historical use sets a traditional design threshold for small general aviation airplanes.

Van's Aircraft commented that the performance enhancements in this rule should encourage greater ownership in light-sport category airplanes since they will resemble the operational capabilities of amateur-built airplanes. FAA anticipates the higher stall speed should also encourage higher certificated pilots into ownership of light-sport category airplanes resulting in greater safety benefits. Compared to sport pilots, private and commercial pilots have completed more training and have more experience with the larger operating envelope light-sport category airplanes will have as a result of this rule.

One commenter requested the stall speed be increased so that more aircraft are included that can fly safer, under max weight, and with full fuel and passengers. Van's Aircraft stated the proposed 54 knot CAS V_{S1} will result in an unmarketable aircraft, noting the dilemma of needing to choose amongst full fuel, seats, or baggage, but not all three. FAA agrees the NPRM proposal of 54 knots CAS V_{S1} could be limiting to the operational utility of four-seat designs. The increased stall speed in this rule will increase safety by accommodating airplane designs for heavier weight operations, which could result in a reduction in the occurrence of overweight takeoffs.

In considering the maximum stall speed limit for this rule, FAA determined that the majority of four-seat, single-engine general aviation airplanes used in the NPRM analysis were built and originally certificated when, for weight and balance purposes, the U.S. standard average adult passenger weight was 160 pounds in the summer or 165 pounds in the winter.[32] Today, FAA uses body measurement data from the U.S. Centers for Disease Control and Prevention for aircraft weight and balance calculations.[33] That data shows that the average weight for women is 170.8 pounds and for men it is 199.8 pounds.[34] FAA aircraft weight and balance control guidance allows for an additional five pounds of summer clothes and 10 pounds of winter clothes.[35] Thus, in a

conservative scenario, a legacy four-seat aircraft[36] with four men onboard could have, on average, an additional 179 pounds of extra weight to account for.[37] To put the significance of this 179 pounds example in perspective, that equates to approximately 29.8 gallons of avgas, which is slightly more than half the fuel capacity of several popular four-seat legacy airplane models.[38]

Though a 61 knot CAS V_{S0} will allow heavier airplanes than originally proposed in the NPRM, this stall speed will not guarantee adequate takeoff and climb performance for all circumstances, nor will it accommodate overweight takeoffs. Pilots will still be responsible for verifying their airplane's takeoff and landing performance data is suitable for the runway and airport environment and ensuring their airplane's weight and balance is within limits established in the POH. Even with a 61 knot CAS V_{S0}, pilots will still have to determine if they will need to limit the number of passengers or the amount of fuel or baggage carried.

Though NTSB does not provide specific data for accidents caused by overweight airplanes or inadequate takeoff and climb performance, these accidents are usually captured in loss of control data since the airplane fails to takeoff or stalls during initial climb. U.S. general aviation accident data for personal use, single reciprocating engine airplanes from 2008 through 2022 shows loss of control in-flight (LOC-I) was the third most common type of accident.[39] This data is relevant because light-sport category airplanes under this rule share similar performance characteristics with a greater number of other general aviation airplanes. The NTSB LOC-I data in Table 3 shows that takeoff and initial climb experienced the second highest number of fatalities of any flight phase. This is likely because performance margins during takeoff and initial climb are most critical when the aircraft is at its highest gross weight.

Table 3. Fatalities by Phase of Flight Due to LOC-I

Flight Phase	Fatalities (2008 – 2022)
Takeoff and initial climb	205
Enroute	113
Maneuvering	255
Approach and landing	193

FAA notes there could be a myriad of reasons loss of control occurs during takeoff or initial climb, including pilot error occurrences such as over-rotation, poor wind analysis, visual fixation or distraction, loss of visual cues, uncoordinated flight, missed checklist items, or lack of fuel. Regardless, the high number of accidents during the takeoff and initial climb phase related to LOC-I could likely be reduced with aircraft designs that can meet greater operational demands, such as having four seats occupied (for certain pilots) or designs that have better handling in turbulence.

Many commenters recommended a higher stall speed stating that handling would improve in turbulent or gusty conditions. These commenters stated an increase to the proposed V_{S1} would raise the design maneuvering speed, or V_A, which would provide a safety benefit for operations in turbulent air. V_A is the maximum speed at which the limit load can be imposed (either by gusts or full deflection of the control surfaces) without causing structural damage.[40] The EAA, AOPA, NATA, NBAA, GAMA, Sonex, and Elanus Aerospace shared a similar comment that a higher V_{S1} would enable a higher V_A speed, lessening the possibility for an airplane to exceed structural limits. The commenters similarly stated a higher V_A would allow aircraft to be handled more predictably and safely in turbulence and gusty conditions, thereby lessening the probability for a departure from controlled flight. Sessoms Aero added that higher wing loading would allow for more operating margins and varied weather conditions.

FAA agrees with the commenters that heavier airplanes, which are less susceptible to turbulence, require a higher stall speed and resultingly have an increased design maneuvering speed. Operating at or below V_A does not provide structural protection against multiple full control inputs in one axis or full control inputs in more than one axis at the same time. V_A should not be interpreted as a speed that would permit the pilot unrestricted flight-control movement without exceeding airplane structural limits, nor should it be interpreted as a gust penetration speed.

An airplane's V_A is affected by weight. For example, V_A may be 115 knots when the airplane is at maximum takeoff weight, but only 90 knots when the airplane has burned much of its available fuel. FAA agrees that an aircraft's ability to maintain controllability in turbulent air is an important design feature and emphasizes that continued operation in turbulent air may eventually exceed the design loads of the aircraft. NTSB data for 2022 shows that there was one accident and no fatalities related to an in-flight turbulence encounter.[41]

Another commenter identified the need to account for the increased weight of electric airplanes, asserting that stall speeds need to be increased to accommodate the extra weight of electric batteries and achieve practical range for electric airplanes. FAA agrees that the battery capacity of electric airplanes increases significantly the gross weight and an increased stall speed is needed to account for this weight and better enable the continued development of these airplanes. Greater battery capacity allows greater range and endurance, which can increase safety, such as in the case of diverting to an alternate airfield or providing more options for weather avoidance.

ANAC recommended the proposed stalling speed be increased to 61 knots CAS V_{S0} since FAA-accepted ASTM Standard 2245 uses the same static inertia

load criteria for emergency landing conditions as is used by normal category airplanes. ASTM Standard 2245 states that the structure must be designed to protect each occupant during emergency landing conditions when occupants experience the static inertia loads corresponding to the following ultimate load factors of 3 g's upwards, 9 g's forward, and 1.5 g's lateral. These same criteria were originally part of § 23.561 when first published in 1964[42] and now appear in FAA-accepted ASTM Standard F3083/F3083M – 20A, Standard Specification for Emergency Conditions, Occupant Safety and Accommodations, for normal category airplanes. FAA anticipates that these same or similar load factors will be used for light-sport category airplanes as part of the means of compliance to § 22.110 structural integrity and § 22.165 emergency evacuation requirements. FAA agrees with Brazil ANAC that the shared static inertia loads for emergency landing conditions help to justify the 61 knot CAS V_{S0} limit. This criteria also allows for easier adoption, by light-sport category consensus standards organizations, of certain emergency landing crashworthiness consensus standards in ASTM Standard F3083/F3083M – 20A.

To provide a more viable solution for the development of electric airplanes, improve handling in gusty or turbulent conditions, increase the ability to meet greater operational demands and account for the additional weight of today's occupants, and make light-sport category airplanes a more appealing alternative to EAB airplanes, this rule establishes a traditional design stall speed for light-sport category airplanes of a maximum 61 knots CAS V_{S0} in § 22.100(a)(3).[43]

c. Glider Stall Speed

In the NPRM, FAA did not propose to change the existing V_{S1} limit of 45 knots CAS in § 1.1 for light-sport category gliders and motor gliders, hereafter

referred to as gliders. FAA received a few comments requesting the glider stall speed to be increased to the 54 knot CAS V_{S1} limit proposed for airplanes. Sonex recommended the glider stall speed be increased to a minimum of 58 knots V_{S1}. Desert Aerospace cited the need to increase glider stall speed to accommodate an industry trend toward composite gliders. Composite gliders tend to have less parasite drag than older style metal gliders and resultingly have a higher stall speed. Desert Aerospace also cited the dwindling supply and availability of two seat metal gliders used for training and recognized a popular metal training model last produced 42 years ago. Desert Aerospace stated the 45 knot CAS V_{S1} glider stall speed limit may not accommodate the newer two seat composite gliders used for training new glider pilots. Sonex likewise stated an increased V_{S1} would allow the use of modern, two-seat gliders to be used for training.

The 2022 Light-Sport Category Aircraft Continued Operational Safety Report showed that 100 gliders have been certificated in the light-sport category since 2004 and there have been two fatal accidents during that time. The phase of flight of these two fatal accidents were initial climb and post-impact.

FAA agrees with much of Desert Aerospace's and Sonex's comments that glider stall speed could safely be increased. Based on the low accident rate of light-sport category gliders, this rule increases the light-sport category glider stall speed limit in § 22.100(a)(3) to 45 knots CAS V_{S0}.[44] FAA chose to use 45 knots CAS V_{S0} in this rule rather than the 54 or 58 knots CAS V_{S1} suggested by commenters to better align with EASA's and TCCA's glider stall speed criteria that has been used by FAA for type certificated gliders under § 21.17(b). Depending on variances in glider design, it may be possible for a glider to have both a 45 knot CAS V_{S0} and a V_{S1} in the range of 54 to 58 knots CAS.

FAA has previously accepted EASA's glider stall speed criteria in EASA's Certification Specifications, Acceptable Means of Compliance and Guidance Material for Sailplanes and Powered Sailplanes (CS-22)[45] for type certification of gliders under the special class requirements of § 21.17(b). TCCA has also published these same criteria for certification of gliders in its Airworthiness Manual Chapter 522 Subchapter B – Flight – Canadian Aviation Regulations.[46] The stall speed criteria in CS-22 and chapter 522 requires the use of V_{S0} and CAS. The 45 knot CAS V_{S0} in this rule would put the light-sport category stall speed requirement a few knots below the EASA and TCCA design requirement of 90 km/h CAS V_{S0} for gliders with airbrakes retracted and at maximum weight with water ballast.[47] Accordingly, FAA has determined that 45 knot CAS V_{S0} in this rule would be appropriate.

A commenter recommended that a light-sport category glider should have the same stall speed, airspeed [V_H], and weight limitations as a light-sport category airplane and another asked FAA to increase the glider V_{NE} to 135 knots or such limit that is shown to be safe. This rule will impose stall speed limits of 61 knots V_{S0} for light-sport category airplanes and 45 knots V_{S0} for gliders. As for V_H, all light-sport category aircraft with a maximum continuous power limit will be limited by this rule to a maximum speed of 250 knots CAS. Aircraft such as balloons and non-motorized gliders will not be subject to a maximum airspeed limitation in this rule since they lack an engine or motor with a V_H limit. This rule does not need to adopt commenter's recommendation that glider V_{NE} be increased to 130 knots. This rule did not adopt the maximum 120 knot CAS V_{NE} glider limitation from the light-sport aircraft definition and the maximum speed of gliders is well below the 250 knot CAS V_H allowed for light-sport category classes with a maximum continuous power value. Per § 21.181(a)(3)(iv) as revised by this final rule, the

special airworthiness certificate for light-sport category gliders certificated prior to [INSERT DATE 365 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER] will remain effective with a maximum 120 knot CAS V_{NE} limit. Finally, to address the comment regarding weight, this rule does not include a maximum weight limitation for any class of light-sport category aircraft.

d. Weight-Shift-Control and Powered Parachute Aircraft Stall Speed

The NPRM did not propose to change the 45 knot CAS without the use of lift-enhancing devices, V_{S1}, of light-sport category weight-shift-control aircraft. FAA received two similar comments advocating for an increased stall speed for weight-shift-control aircraft equivalent to the 54 knot CAS V_{S1} proposed for airplanes. The commenters supported the higher stall speed to avoid stifling the development of weight-shift-control aircraft. Streamline Designs also supported increasing the stall speed to 54 knots CAS V_{S1} or higher with consensus standard determined crashworthiness requirements and safety equipment. FAA disagrees with an increase to the stall speed of light-sport category weight-shift-control aircraft due to their higher accident rate compared to other classes of light-sport category aircraft. In the 2022 Special Light-Sport Category Aircraft Continued Operational Safety Report, which includes data dating back to fiscal year 2005, weight-shift-control aircraft had an 11.2% fatal accident rate for their class, which was significantly greater than the next highest rate of 2.2% for airplanes. In addition, FAA did not receive sufficient data or justification from commenters to convince FAA that increasing the stall speed would be appropriate for this class. FAA encourages consensus standards organizations for light-sport category weight-shift-control aircraft to find ways to improve the safety of weight-shift-control aircraft to

reduce the accident rate. This rule will continue to require a maximum V_{S1} of 45 knots CAS for light-sport category weight-shift-control aircraft.

Streamline Designs also favored a 54 knot CAS V_{S1} stall speed for powered parachutes using the same justification as they used for weight-shift-control aircraft. However, this rule does not include a stall speed limitation for powered parachutes because they operate at relatively slow speeds.

e. Requests to Clarify V_{S1}

A few commenters requested FAA clarify V_{S1} for light-sport category aircraft. The NPRM stated the acronym V_{S1} means "Maximum Stalling Speed (in clean configuration)." The Sentinel Owners & Pilots Association stated this NPRM definition represents a disconnect given that § 1.2 defines V_{S1} to mean "the stall[ing] speed or the minimum steady flight speed obtained in a specific configuration." In addition, EASA requested that FAA define "clean configuration" as used in the NPRM meaning of V_{S1}.

In § 1.2, V_{S1} means the stalling speed or the minimum steady flight speed obtained in a specific configuration. Because of the large variances in aircraft designs, each model could, theoretically, have its own unique V_{S1} as determined by the aircraft manufacturer. Not only could V_{S1} differ by flap position, but it could also differ by weight, center of gravity (CG), or other criteria specified by the manufacturer. When lift-enhancing devices such as flaps or slats are not extended, this is commonly referred to as a clean wing configuration, or "clean configuration" as the term was used in the NPRM. FAA is not adding a definition of "clean configuration" in this rule; the regulatory text "without the use of lift-enhancing devices" carries the same meaning. The NPRM discussion of V_{S1} being in a clean configuration was in recognition of the prohibition of using lift-enhancing devices in determining compliance with the maximum V_{S1} design

requirement. In other words, the specific configuration of V_{S1} for light-sport category aircraft is obtained without the use of lift-enhancing devices, as stated in the light-sport aircraft definition and in § 22.100 of this rule.[48]

f. Use of V_{S0} Rather than V_{S1} for the Stall Speed

Some commenters stated V_{S0} is more appropriate to use for the stall speed limitation in § 22.100 rather than V_{S1} because it represents the landing configuration and is consistent with the NPRM's focus on accidents during landing and landing speeds.

As stated in the NPRM, slower landing speeds benefit survivability in emergency landings by reducing kinetic energy. However, the use of V_{S1} does not prohibit the installation of lift-enhancing devices that could be used to lower landing speeds in normal or emergency operations. The advantage of using a clean wing configuration for showing compliance with a maximum V_{S1} requirement is that it levels the playing field, making all aircraft comply using the same configuration, i.e., without the use of lift-enhancing devices.

When V_{S0} (landing configuration) is used as the design criteria, manufacturers may opt to use less wing area, knowing they can add lift-enhancing devices such leading-edge slats or adjust the size or position of trailing-edge flaps until the airplane meets the V_{S0} requirement. While a smaller wing increases efficiency due to less form drag and less weight, the addition of certain lift enhancing devices can add weight, complexity, and increase risk in the event of abnormal operation.

The use of V_{S1} or V_{S0} as design criteria to meet an eligibility requirement is situational and neither is better than the other. When V_{S1} is used as design criteria, it would not prohibit the installation or operational use of flaps or other lift-enhancing devices during landing, if installed. The use of V_{S1} in the 2004 final rule was appropriate

since the rule's weight limit kept designs simple where flaps were the predominant lift-enhancing device. The 2004 final rule's weight limit made the addition of other lift-enhancing devices, such as leading-edge slats, weight prohibitive.

For light-sport category airplanes manufactured under this rule, V_{S0} was selected instead of V_{S1} for the stall speed limit in § 22.100(a)(3) because of the historical use of 61 knots V_{S0} as a stall speed design criterion for small general aviation airplanes, as well as the other reasons previously cited in the airplane stall speed discussion. As discussed in the glider stall speed section, V_{S0} is used for gliders manufactured under this rule to better align with EASA's and TCCA's stall speed criteria in CS-22 and chapter 522, respectively, which has been accepted for use by FAA for the type certification of gliders under § 21.17(b). In this instance, the use of V_{S0} could allow easier adoption of EASA's and TCCA's glider criteria by light-sport category glider consensus standards organizations. As discussed in the weight-shift-control aircraft section, the 45 knot CAS V_{S1} limit remains unchanged; this rule does not increase the stall speed of these aircraft in § 22.100(a)(3) due to their higher accident rate compared to other classes of light-sport category aircraft.

g. Lift-Enhancing Devices

Many commenters that supported using V_{S0} rather than V_{S1} discussed airplane design, primarily the use of lift-enhancing devices. Several commenters conveyed that the V_{S1} requirement prohibits, hampers the development of, or does not recognize the effectiveness of lift-enhancing devices on light-sport category aircraft. Several commenters favored the installation of passively induced or automatic lift-enhancing devices, such as aerodynamically actuated leading-edge slats, citing that they were

simple, did not increase the workload of the pilot, and would greatly lower landing speeds and energies.

FAA emphasizes that lift-enhancing devices have never been prohibited from the designs of light-sport category aircraft, nor will they be going forward under this rule. Aircraft manufacturers may install lift-enhancing devices; however, these devices may not be used to meet a V_{S1} eligibility requirement. After-market lift-enhancing devices, such as leading-edge slats or short takeoff and landing wing extenders, are permitted on a light-sport category airplane only if they are approved by the aircraft manufacturer or a person acceptable to FAA.[49] Light-sport category aircraft certificated prior to [INSERT DATE 365 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER] must continue to meet the V_{S1} requirements in § 21.181(a)(3)(iv)(D) for the light-sport category airworthiness certificate to remain effective. Aircraft manufacturers or persons acceptable to FAA cannot authorize major alterations to these aircraft that would result in exceeding any applicable design and performance criteria in § 21.181(a)(3)(iv) without the manufacturer or an aircraft owner petitioning for and obtaining an exemption from FAA.

A few commenters stated vortex generators should be permitted on light-sport category airplanes to meet the stall speed limit or encouraged the inclusion of speedbrakes in light-sport category aircraft. Vortex generators do not necessarily lower the stall speed; rather they control which parts of the wing stall first to control the wing's stall characteristics. A speedbrake is usually a fuselage mounted panel or plate that extends into the airstream to produce drag. Spoilers are similar devices mounted on the topside of an aircraft's wing that also produce drag. A speedbrake is used to slow down the aircraft while spoilers can be used to decrease speed, increase descent rate, or roll the

aircraft. Vortex generators, spoilers, and speed brakes are not lift-enhancing devices and may be installed on light-sport category aircraft by the aircraft manufacturer or with approval from a person acceptable to FAA. Section IV.J.6. explains "a person acceptable to FAA."

h. CAS versus Indicated Airspeed (IAS)

A few commenters requested the stall speed be specified in IAS rather than CAS. One commenter stated this rule should be rewritten to accommodate the commonly accepted practice of using IAS in the aircraft.

CAS is the speed at which an airplane is moving through the air. IAS is displayed on the airspeed indicator and is read by the pilot. IAS differs from CAS in that IAS includes any installation (or position) and instrumentation errors. For example, the accuracy of IAS may be affected by minor misalignment of the airplane's pitot tube; whereas CAS testing traditionally uses properly calibrated instruments and a test airspeed system independent of the aircraft's installed equipment. The installation and instrumentation errors are greatest at slow speeds and higher angles of attack, i.e., approaching or at stall speed, and can result in CAS differing from IAS by several knots or more. For example, the stall speed of an airplane may be 50 knots IAS, but 56 knots CAS.

Position corrections vary among airplane models and can even vary among individual airplanes of the same model. As a result, defining stall speed in IAS would yield gross inconsistencies when determining whether an airplane meets an eligibility requirement for design stall speed. Because of these concerns, FAA disagrees with the comments suggesting the design stall speed criterion be specified in IAS rather than CAS. FAA requires CAS for determining whether an airplane meets the design stall speed

because it represents the airspeed that would be measured by an airspeed system without position and instrumentation errors. This ensures all airplanes meet the same standard. Regardless, for newly manufactured light-sport category airplanes, the stall speed will be determined by the aircraft manufacturer and verified during ground and flight testing as required by § 22.195.[50]

i. Increase V_S to Allow Legacy and EAB Airplane Designs

Many commenters requested a higher stall speed so that certain normal category or EAB airplane designs could be flown as a light-sport category airplane because the proposed 54 knot CAS V_{S1} limit would exclude many legacy aircraft. Piper commented that it supports an increased V_{S1} of 58 knots CAS in order to include the PA-28-161 and PA-28-181 series of aircraft.

FAA finds that raising the stall speed in and of itself would not necessarily allow legacy aircraft to come under the umbrella of light-sport category. Currently, § 21.190(b)(2) prohibits an airplane from receiving certification in the light-sport category if that airplane has been previously issued a standard, primary, restricted, limited, or provisional airworthiness certificate, or an equivalent airworthiness certificate issued by a foreign civil aviation authority. This final rule would include that same prohibition in § 22.100. Accordingly, all legacy airplanes cited by commenters that have previously held a standard airworthiness certificate for the normal category would not be eligible for a light-sport category airworthiness certificate.

Though not specifically prohibited in §§ 21.190 and 22.100, an airplane previously certificated under the § 21.191(g) experimental purpose of operating an amateur-built aircraft likely would not be able to subsequently be certificated in the light-sport category. EAB airplanes are built by an amateur builder instead of by a kit

manufacturer, therefore the airworthiness certification processes and requirements for EAB are dissimilar and noncompatible with light-sport category requirements. For example, a certificated EAB kit airplane could not obtain a statement of compliance to FAA-accepted consensus standards for certification in the light-sport category. This is because a kit manufacturer could not sign a statement of compliance since the kit manufacturer did not completely build the airplane or conduct necessary ground and flight tests. Likewise, an amateur builder could not sign a statement of compliance since they are not the aircraft manufacturer in terms of holding the kit model's design, manufacturing, and test data, nor could they state the kit manufacturer complied with all applicable consensus standards. Per § 21.190, a manufacturer's statement of compliance is required for a person to apply for a special airworthiness certificate in the light-sport category.

Despite these prohibitions, a manufacturer of normal category or amateur-built kit airplanes would be permitted to produce new light-sport category airplanes of its eligible models. A manufacturer of new normal category airplanes could apply for an airworthiness certificate in either the normal or light-sport category. A manufacturer of airplane kits could likewise produce new, fully assembled airplanes of one of its kit models for certification in the light-sport category, as many kit manufacturers do today. Though no primary category models were specifically mentioned by commenters, manufacturers of eligible models could also produce new airplanes for certification in either the light-sport or primary category.

For light-sport category airworthiness certification in this rule, aircraft manufacturers would have to design, produce, assemble, and test the airplane, with appropriately trained personnel pursuant to § 22.190, so that they could state compliance

to FAA-accepted consensus standards of applicable part 22, subpart B requirements. Aircraft manufacturers would also have to comply with applicable requirements in § 21.190.

j. Increase Vs to Enable More Designs and Traditional Handling

Many commenters supporting a higher stall speed stated the increase would benefit aircraft designs, allowing new designs to handle more like legacy aircraft. FAA agrees that a higher stall speed would provide an aircraft manufacturer with more design options to improve handling. A higher stall speed, compatible with legacy airplanes, would allow light-sport category airplanes to be manufactured with higher gross weight, allowing designers more flexibility in adding size, structures, or equipment to airplanes. The increased gross weight allowance should alleviate the handling challenges in turbulent winds of current light-sport category airplane designs due to light wing loading.

k. V_S Comments Related to V_H

A few commenters discussed increasing the proposed V_{S1} to align with this rule's V_H, a maximum speed of 250 knots CAS in level flight at maximum continuous power under standard atmospheric conditions at sea level. One commenter proposed lowering V_H to something "realistic," noting that three times 54 knots is 162 knots and that Brazil's limit is 185 knots. Van's Aircraft supported the NPRM increase to 250 knots V_H and stated stall speed should not control top speed. The NPRM stated an airplane's maximum airspeed is typically limited to approximately three to four times the aircraft's V_{S1} under ideal conditions. Though three or four times the proposed 54 knot V_{S1} would be well under this rule's maximum V_H of 250 knots CAS, FAA did acknowledge in the NPRM that advances in technology and manufacturing practices could enable higher speeds.

FAA disagrees with comments suggesting the light-sport category stall speed should align with the V_H of the final rule. FAA intends this final rule to provide a means for greater performance of light-sport category airplanes than currently exists. Both the stall speed limit and the maximum airspeed limit were established based upon separate considerations and one limit should not be changed merely to correspond to the other limit. This could potentially constrain future development and technological advances in the manufacturing of light-sport category aircraft. For example, Van's Aircraft provided an example of an airplane with turbocharged engine that has a 54 knot stall speed and a V_H close to 245 knots CAS showing the traditional three- or four-times Vs correlation is not always accurate. Van's Aircraft also stated electric motors will break this traditional paradigm due to their greater speed ratios. The stall speed limits were discussed earlier in this section and V_H is discussed in the § 22.100(a)(4) section.

l. Increase Vs with the Use of Angle of Attack (AOA) Indicators and Other Safety Features

Some commenters, including Streamline Designs, suggested FAA provide requirements in part 22 for crashworthiness and safety enhancing features, where aircraft that met FAA-accepted consensus standards could have a higher stall speed limit. Other commenters, including the Airplane Factory and Van's Aircraft, favored a requirement for the installation of AOA indicators to allow a stall speed greater than the proposed 54 knots CAS V_{S1} citing it would increase safety or prevent a tendency to inadvertently depart controlled flight. Van's Aircraft also stated increased stall speeds could be linked to other safety enhancing devices determined in the consensus standards process.

FAA agrees that AOA equipment, envelope protection systems, and other similar safety equipment could prove to be very beneficial in significantly reducing loss of

control accidents. AOA indicators assist pilots with stall margin awareness, stall prevention, and recovery from unusual attitudes or upset. An AOA indicator provides a visual indication of the margin that exists between the current airfoil AOA, and the AOA at which the airfoil will stall (i.e., critical AOA). AOA indicators can also be useful in emergency situations such as windshear or terrain avoidance maneuvers where the pilot operates the aircraft very near the critical AOA or in diagnosing problems with the pitot-static system, such as an iced-over pitot tube that provides faulty airspeed readings.

Recently, FAA released a special airworthiness information bulletin (SAIB)[51] for AOA alerting systems citing these benefits. The SAIB recommended owners and operators of airplanes type certificated under part 23 and EAB airplanes install and calibrate critical AOA alerting systems and receive training on the use of AOA indicators and how to incorporate them in instrument scans. The SAIB stated, at this time, the airworthiness concern is not an unsafe condition that would warrant airworthiness directive (AD) action under part 39.

For light-sport category aircraft, FAA concurs with the SAIB recommendation for the voluntary installation of AOA equipment or systems; however, FAA disagrees with making AOA indicators, or other envelope protection devices, required equipment for light-sport category airplanes or tying a § 22.100 stall speed requirement to their presence in the cockpit. Regardless of whether an aircraft has a high or low stall speed due to the presence of an AOA indicator, survivability of loss of control accidents are very low since ground impact usually occurs at various unpredictable attitudes. Airplane crashworthiness designs cannot account for the severity of these types of impact stresses. Emergency landing crashworthiness designs are only valid for situations where the pilot maintains control of the aircraft.

Allowing consensus standards to establish an increased stall speed based on the presence of AOA equipment or similar envelope protection devices would pose unique challenges. For instance, if a § 22.100 eligibility criterion for airworthiness certification is based on the functionality of an installed AOA indicator, then operations of the airplane would be contingent on having a properly trained pilot using properly calibrated and operating AOA equipment. This may be potentially too restrictive considering that airplanes can be safely flown without this equipment installed or operative. Ownership transfers may also become overly complicated in finding a pilot previously trained, or in need of training, on the installed AOA system. Avionics upgrades or changes could also invalidate the airworthiness certificate or result in pilot training requirements to operate the aircraft.

FAA's decision is also based on concerns about equipment limitations, cost, training, ergonomics, continued calibration, and the lack of standardization among AOA systems. Some AOA systems have limitations, such as only being calibrated for one flap position. At this time, FAA does not consider AOA systems to be mature enough to be a complete solution for multiple configurations, therefore FAA declines to prescribe them as required equipment. In addition, heated probes or vanes would be necessary to ensure AOA equipment remains operational when encountering icing even though AOA indications may not be reliable because of wing contamination.

Though relatively inexpensive AOA equipment is available, there are other costs that must be accounted for such as continued maintenance and calibration of the equipment. A few avionics manufacturers embed an AOA indicator on their multi-function displays. While these avionics displays are very popular, they also increase costs significantly. In many of these displays, the AOA indicator is located next to the airspeed

indicator so if the pilot fails to monitor airspeed during a critical flight segment, they are likely to not have the AOA indicator in view as well. An accompanying audible or haptic feedback system would be necessary to provide for a more fail-proof system, however, these add-ons may also increase costs.

FAA notes pilot training may be difficult since there are a variety of AOA systems being marketed, each with their unique displays, operating parameters, and differing levels of complexity. Pilots would have to be trained on their installed equipment and fully understand the equipment's limitations. SAIB referenced a 2019 FAA study that found pilots were not able to use AOA indicators effectively without training.[52]

Though FAA highly encourages the installation and use of AOA and envelope protection systems, FAA does not support mandating, as part of this final rule, new requirements in parts 22 or 91 for the installation of this equipment on light-sport category aircraft. In addition, the NPRM did not propose or discuss potentially requiring the installation of new equipment such as AOA indicators and such equipage requirements would most appropriately be achieved through new notice and comment rulemaking.

m. Increase V_S with the Use of Crashworthiness Requirements or Consensus Standards

Sonex recommended that FAA have flexibility to consider additional safety enhancements, such as crashworthiness, to expand light-sport category aircraft parameters. Two commenters recommended relying upon consensus standards instead of, or to exceed, specific stall speeds. Though FAA encourages consensus standards organizations and light-sport category aircraft manufacturers to adopt crashworthy designs, FAA disagrees with allowing consensus standards to determine eligibility

requirements. This is because consensus standards often change, which could lead to confusion and non-standard configurations within the light-sport category. In addition, establishing a maximum airplane stall speed of 61 knots V_{S0} in this rule follows precedent of other aircraft categories in establishing clear and distinctive eligibility or applicability criteria. Finally, to the extent that FAA deems it appropriate to expand parameters for the light-sport category, FAA has the flexibility, like it has in this final rule, to engage in further rulemaking.

Another commenter suggested rewarding crashworthy designs using off-the-shelf technologies with an unlimited maximum stall speed. FAA disagrees with this suggestion. Crashworthiness designs for unlimited speeds are unreasonable because even if the crashworthiness designs reduced damage to the aircraft, the human body would not likely be able to tolerate such high-impact forces and stresses that unlimited stall speeds would implicate.

One commenter recommended designs with roll cage like structures and seats capable of protecting the pilot and passengers from large vertical impacts could allow stall speeds above 54 knots. Other commenters recommended that airbags, crash protection, or ballistic recovery systems could enable a higher stall speed. FAA agrees with commenters that designs and equipment such as roll cage structures, crush zones, ballistic parachutes, airbags, AOA indicators, and fire-resistant, appropriately cushioned seats with five-point shoulder harnesses would be desirable safety enhancing features for manufacturers to include in their light-sport category aircraft. Some of these would benefit loss-of-control prevention while others would benefit crashworthiness.

Since this rule removes the existing weight limitations of light-sport category aircraft manufactured on or after [INSERT DATE 365 DAYS AFTER DATE OF

PUBLICATION IN THE FEDERAL REGISTER], manufacturers will have greater flexibility to design new airplanes with crashworthiness and safety enhancing features unique to their aircraft's design. FAA is not mandating these features in this final rule because the NPRM did not propose or discuss potentially requiring the design or installation of specific crashworthiness features or safety equipment and any specific crashworthiness requirements would most appropriately be achieved through new notice and comment rulemaking. The NPRM noted the increased weight allowance would enable manufacturers to include safety-enhancing designs and equipment such as advanced stall resistant airframes, increased load factor resilience, improved passenger cabin crash safety mechanisms, ballistic safety parachutes, and passenger airbags.

ANAC asked if FAA considered mandating stall warning for light-sport category airplanes with stall speeds exceeding 45 knots. FAA supports the installation of a stall warning system and encourages consensus standards organizations for light-sport category aircraft to create stall warning system consensus standards for applicable aircraft classes to warn pilots of an impending stall. This would increase safety by preventing stalls that could lead to an inflight loss of control accident. The NPRM did not propose or discuss potentially requiring the installation of stall warning devices.

n. Use Horsepower in Addition to Stall Speed

One commenter suggested allowing a slightly higher stall speed with a maximum horsepower limit of 180 or 200 hp to allow the "Warrior (PA-160)" and similar aircraft to qualify as light-sport category aircraft. While FAA did consider using horsepower as an eligibility criterion for § 22.100, FAA ultimately disagrees with this approach. Requiring a maximum horsepower limit could stifle advancements and innovations in engine and powerplant development. In addition, such an approach does not account for all types of

engines and would be difficult to apply to aircraft with multiple engines. For instance, electric or hybrid motors would need a corresponding kilowatt value or some other unique parameter. A single horsepower or kilowatt value would also cause problems for powered-lift with multiple engine or motor configurations since they would quickly exceed reasonable horsepower or kilowatt values for airplanes due to their higher thrust requirements. In addition, a kilowatt measurement is not a commonly used term for light aircraft and may cause confusion.

o. Other Alternatives

One commenter suggested using a reasonable kinetic energy limit instead of stall speed to limit such energy in a runway departure accident. As discussed in the NPRM, FAA recognizes the role kinetic energy plays in reducing injuries and fatalities in survivable aircraft accidents. Regardless, FAA decided not to use a specific kinetic energy value in this rule as an eligibility criterion because it would be more difficult to make comparisons with other airplanes in the light-sport, primary, or normal categories given the lack of kinetic energy values for airplanes in these categories.

Another commenter recommended eliminating the stall speed restriction, asserting that a four-seat restriction will limit the maximum weight of light-sport aircraft to about 3,000 pounds. FAA disagrees with the commenter's suggestion because a seating restriction would not singularly limit the size or weight of an aircraft and could result in aircraft that exceed the scope of the design, production, and airworthiness requirements within part 22. As discussed in the § 22.100(a)(2) section, FAA did not propose a 3,000 pounds limit in the NPRM, nor is there a regulatory maximum gross weight limit in this rule.

One commenter encouraged FAA to look for metrics other than stall speed that would more directly measure and fully capture the safety intent of the MOSAIC rule. That commenter suggested handling qualities as a potentially better metric. FAA disagrees with requiring an eligibility criterion based on handling qualities. This criterion is too subjective to be used for eligibility. As an example, during the development of the NPRM, FAA considered establishing eligibility simply based on an aircraft being easy to fly. However, it was too subjective to define exactly what "easy to fly" means since it means different things for different classes of aircraft and for different pilots. For example, a low-hour pilot may find a particular airplane is difficult to fly, but a pilot with more training or experience may find the same aircraft easy to fly. Even fast military jets with narrow performance margins can be found "easy to fly" by low-time military students after they have sufficient training. Similar concerns would arise with a handling qualities eligibility criterion.

p. Multi-Engine Airplane Stall Speed

On [INSERT DATE 365 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER], this rule removes the § 1.1 light-sport aircraft definition restriction to have a single, reciprocating engine and will allow any type and number of engines or motors. Light-sport category consensus standards will have to be developed and gain FAA acceptance for multi-engine airplanes to be manufactured under this rule. Appropriate engine inoperative minimum control airspeeds (V_{MC}) and other speeds applicable to multi-engine airplanes will need to be included in the consensus standards for multi-engine airplanes. FAA encourages consensus standards organizations for light-sport category aircraft to adapt applicable FAA-accepted consensus standards used for multi-engine normal category airplanes.

FAA received a few comments on multi-engine airplanes. One commenter recommended letting consensus standard bodies establish multi-engine V speed guidelines, noting that a stall speed well below the V_{MC} could be unsafe, that the V_{S1}, V_{S0}, and V_{MC} dynamic must be considered, and that part 23 has long eschewed a set stall speed for multi-engine aircraft.

FAA agrees that light-sport category airplane multi-engine airspeeds will need to be developed in new consensus standards. Consensus standards organizations for light-sport category airplanes could adapt consensus standards that have already been developed specifically for multi-engine normal category airplanes. Since this rule has increased the light-sport category airplane maximum stall speed limit to 61 knots CAS V_{S0}, a historical speed used for normal category airplanes, the proposed 54 knots CAS V_{S1} is no longer a consideration for multi-engine performance.

TCCA commented that the loss of control requirement in § 22.105 raises the potential for asymmetric loss of thrust concerns and stall related loss of control concerns. FAA agrees that asymmetric loss of thrust may result in loss of control now that light-sport category aircraft no longer have a single powered engine limit, but FAA notes that § 22.105 requires light-sport category aircraft to be consistently and predictably controllable and maneuverable at all loading conditions during all phases of flight and not have a tendency to depart controlled flight inadvertently or require exceptional piloting skill, alertness, or strength. This requirement applies to all light-sport category aircraft, whether single- or multi-engine. Multi-engine airplanes must meet the requirements of § 22.105 when operating in engine-inoperative scenarios when at or above the minimum controllable airspeeds for their airplane and above the airplane stall speed. Again, light-sport category consensus standards organizations, with FAA participation, will have to

create appropriate consensus standards for multi-engine airplanes or adapt consensus standards already established for normal category multi-engine airplanes.

7. Maximum Airspeed at Maximum Continuous Power (V_H) (§ 22.100(a)(4))

As part of the eligibility criteria in § 22.100, FAA proposed a 250 knot CAS maximum speed at maximum continuous power (V_H) under standard atmospheric conditions at sea level. This rule makes a correction because the NPRM incorrectly used "available" instead of "continuous" in the proposed regulatory text for § 22.100(a)(4) and also did not specify the § 1.2 V_H criterion of being in level flight. While the NPRM regulatory text was incorrect, the NPRM preamble used the correct word "continuous" in defining V_H in the list of frequently used acronyms and used V_H throughout the maximum airspeed discussion in the NPRM's preamble. The V_H section heading in the NPRM preamble stated, "Maximum V_H Airspeed in Level Flight" to show the intent to align with the § 1.2 meaning. The NPRM explained that a maximum speed of 250 knots CAS at maximum continuous power was intended to provide an upper limit appropriate for a category of aircraft intended for recreation, flight training, and limited aerial work. This final rule for § 22.100(a)(4) includes the increased maximum speed of 250 knots CAS in level flight with maximum continuous power (V_H) under standard atmospheric conditions at sea level.

Based on public comments, support for the increased maximum speed in this rule was mixed. AEA/ARSA opposed the increase because primary and normal category aircraft already allow for an increased airspeed above 120 knots CAS. FAA disagrees with AEA/ARSA. As previously discussed throughout several sections of this preamble, including the general aviation safety argument in section IV.C, the use of consensus standards in the certification of the light-sport category over the past two decades has

proven to be successful based on the manufacture of thousands of light-sport category aircraft and their accident rate as shown in the 2022 Light-Sport Category Aircraft Continued Operational Safety Report. Because of the other performance enhancements proposed in this rule that afford light-sport category aircraft an increase in size and weight, an increase in maximum allowable airspeed was necessary.

One commenter supported a maximum cruise speed of 200 knots, asserting that speeds greater than 200 knots are dangerous. Another commenter stated they were skeptical that the higher speed limit was safe. Neither commenter provided justification to support their statements. In NTSB accident data reviewed by FAA for the enroute phase of flight for U.S. general aviation airplanes with one or more reciprocating engines used for personal flight, "speed" was not listed as a defining event that caused an accident.[53]

Several commenters were in favor of the maximum airspeed increase. One commenter stated safety will be increased and airspace congestion will be reduced because light-sport category aircraft will be able to operate at faster approach speeds similar to corporate and commercial jets and turboprops. FAA cautions that the maximum airspeed increase should not be considered as justification to operate within the traffic flows of larger commercial and corporate aircraft. These aircraft produce wake vortices that could cause the loss of control of smaller, lighter aircraft.

GAMA, EAA, AOPA, NATA, and NBAA also supported 250 knots CAS as the maximum airspeed limit for this rule. They stated safety statistics do not show maximum speeds to be a significant risk in small general aviation aircraft and a higher V_H will ensure light-sport category aircraft are not built underpowered for the sake of meeting a

lower maximum speed, thereby sacrificing safety by limiting climb performance. FAA agrees.

Van's Aircraft also agreed with the maximum speed expansion for a variety of reasons citing past EAB aircraft community experience in this speed range and that safety statistics show little risk associated with speed. Autogyro supported the 250 knot CAS maximum airspeed at V_H, asserting it will improve efficiency and keep light-sport category aircraft as a practical and appealing choice. FAA agrees with these comments as they support FAA's goal of increasing safety by making light-sport category airplanes a more appealing choice than EAB airplanes.

The NPRM noted, in general, the stall speed of an aircraft indirectly limits its maximum airspeed to a value of three or four times the stalling speed. One commenter objected to the notion of indirect limitations on the basis of their not improving safety. FAA clarifies that the 250 knot CAS maximum airspeed at V_H in this rule is not an indirect limitation and is not based on being three to four times the proposed 54 knot CAS stall speed. Another commenter opined that the 250-knot maximum speed should not be an issue for most, asserting that few aircraft that meet other limitations would be able to exceed 150 knots CAS. Van's Aircraft commented that new turbocharged engines are being used on many European aircraft that have a stall speed just under 54 knots and a V_H close to 245 knots CAS. Van's Aircraft asserted stall speed cannot and should not be used to limit top speed. FAA agrees with Van's Aircraft and re-emphasizes the reasoning in the NPRM for a maximum speed of 250 knots CAS at V_H was to allow for potential technology and manufacturing advances that could enable higher speeds (up to 250 knots CAS V_H).

EASA asked whether helicopters and powered-lift would be subject to this 250 knot maximum airspeed. In response, yes, § 22.100(a)(4) applies to all classes of light-sport category aircraft that have engines or motors with a maximum continuous power setting or limit.

8. Non-Pressurized Cabin (§ 22.100(a)(5))

The NPRM proposed to move the existing requirement for light-sport category aircraft to have a non-pressurized cabin, if equipped with a cabin, from § 1.1 to § 22.100(a)(5). A commenter recommended this rule allow for pressurized aircraft, provided that the pressurization requires minimum pilot action for use. FAA disagrees with the commenter's recommendation. Cabin pressurization systems and the associated pressure vessel are complex to design and manufacture and the systems can be difficult to operate. Pressurized aircraft fly at higher altitudes and may need an oxygen system. All these complexities come with increased risk. One of the main concerns with a pressurized fuselage is the increased risk associated with complex and time-consuming maintenance and repair. The effects of an improperly maintained pressurized cabin can result in severe consequences.

FAA's advisory circulars for acceptable methods, techniques, and practices for aircraft inspection, repairs, and alterations is only applicable to non-pressurized areas of civil aircraft[54] because inspecting, repairing, or altering pressurized structures requires different considerations. For example, with regard to inspecting, a crack in a non-pressurized fuselage may not be a significant problem, but the same crack in a pressurized structure could be catastrophic. When repairing or altering a pressurized aircraft, an engineering analysis may be required to account for the effects of pressurization. While FAA is allowing some additional complexity in this rule, such as

retractable landing gear, FAA has determined the complexity and risk associated with a pressurized fuselage is beyond what FAA deems suitable for the light-sport category.

9. Legacy Aircraft (§ 22.100(a)(6))

GAMA commented that FAA should allow a way for newly manufactured models of part 23 and 27 type certificated aircraft that meet the light-sport category aircraft requirements to be able to be modified, improved, produced, and certificated under part 22. Another commenter stated the number of light-sport category aircraft would increase by more than 30,000 if qualifying Cessna and Piper aircraft were all converted. Similarly, EASA noted an overlap between the NPRM and part 23, amendment 64 applicability and asked whether applicants had full discretion in selecting a certification path. FAA agrees manufacturers may certificate eligible, newly produced aircraft in either the normal, primary, or light-sport category. As previously discussed in section IV.F.6.i, if an aircraft is eligible for airworthiness certification in both normal and light-sport categories, then the aircraft manufacturer may choose which certification path to follow. Once an aircraft is issued a standard airworthiness certificate for the normal category, it cannot be subsequently certificated in the light-sport category pursuant to § 22.100(a). Adding provisions in this rule that would allow manufacturers of eligible, newly produced, non-certificated aircraft to choose either original certification in the normal or light-sport category are not necessary. Nothing in this rule prevents manufacturers from choosing an appropriate certification path.

10. Compliance to Part 22, Subpart B (§ 22.100(a)(7))

FAA-accepted consensus standards for the design, production, and airworthiness of light-sport category aircraft will be the means of compliance to the regulatory requirements in part 22, subpart B. FAA adopts this provision as proposed, with the small

correction of deleting “aircraft” from § 22.100(a)(7) in this final rule because the word was already included in the lead-in statement of § 22.100(a).

VAI and Skyryse recommended that FAA allow for other means of FAA-accepted compliance to part 22 requirements to FAA-accepted consensus standards. The 2004 final rule required, and the NPRM proposed requirements, for light-sport category aircraft to meet applicable consensus standards. Allowing other means of compliance (i) would represent a significant departure from the establishment of the light-sport category around FAA-accepted consensus standards, (ii) may impact industry collaboration on development of consensus standards, and (iii) would increase burden on FAA in reviewing and accepting more standards. FAA disagrees with the proposal as such a change should not be made without public notice and comment.

A commenter stated the MOSAIC rule is about fixed wing aircraft and questioned why powered parachutes are being subjected to new rules and regulations under the MOSAIC rule if they are not receiving any advantages and there were no glaring problems. FAA disagrees with the commenter’s statement that this rule is about fixed wing aircraft. This rule applies to all classes of aircraft certificated in the light-sport category, which includes the addition of rotorcraft and powered-lift. The new part 22 performance-based requirements in this rule apply to all light-sport category classes regardless of being subject to any beneficial performance expansions. The new requirements will serve to guide consensus standards bodies in developing appropriate consensus standards that would be acceptable to FAA. As stated in the NPRM, FAA expects that compliance with these requirements would reduce the occurrence of design and production defects, resulting in aircraft that are safe for their intended operations.

11. Aircraft Manufactured Outside the United States (§ 22.100(b))

GAMA requested clarification on how an aircraft gains airworthiness in the U.S. if it already has an existing airworthiness certificate from another regulatory entity. This final rule retains, but relocates, the existing § 21.190(b)(2) requirement to § 22.100(a)(6) that aircraft having previously been issued a standard, primary, restricted, limited, or provisional airworthiness certificate, or an equivalent airworthiness certificate issued by a foreign civil aviation authority, would not be eligible for a special airworthiness certificate in the light-sport category. In addition, for aircraft manufactured outside the United States, the aircraft also needs to meet the country of manufacture bilateral agreement and certification requirements of § 22.100(b)(1), which this rule relocates from current § 21.190(d). Otherwise, aircraft that have not been excluded by these requirements would have to be eligible for airworthiness certification in the light-sport category and comply with the requirements of § 21.190 and the applicable requirements in part 22, in effect at the time of airworthiness certification.

12. Eligible Aircraft Located Overseas (§ 22.100(b)(2))

Because proposed § 22.100(b)(1) was omitted from the final rule, proposed § 22.100(b)(3) will be renumbered as § 22.100(b)(2). This provision, unchanged from existing § 21.190(d)(2), requires an applicant for a special airworthiness certificate in the light-sport category for an aircraft manufactured outside the United States to provide evidence that the aircraft is eligible for an airworthiness certificate, flight authorization, or other similar certification in its country of manufacture. EASA asked about what would demonstrate eligibility under proposed § 22.100(b)(3) for a European Union (EU) manufactured, EASA design compliant aircraft.

Questions about existing requirements that are substantively unchanged by this rule are outside the scope of the final rule. Specific questions about EU manufactured

aircraft that meet EASA applicability criteria for declaration of aircraft design compliance are more suitable for the Aircraft Certification Service's Compliance and Airworthiness Division (AIR-700). This division issues all design approvals for both domestic and foreign manufacturers as well as production and airworthiness certificates, executes continued operational safety processes, and provides flight test support.

13. Control and Maneuverability (§ 22.105)

The provisions in § 22.105 require light-sport category aircraft to be consistently and predictably controllable and maneuverable at all loading conditions during all phases of flight. In addition, the aircraft must not have a tendency to inadvertently depart controlled flight or require exceptional piloting skill, alertness, or strength. As discussed in the section on simplified flight controls, § 22.180, the phrase "through the normal use of primary flight controls" that was included in proposed § 22.105(a) has been omitted from this requirement in the final rule so the control and maneuverability requirement now will be applicable to aircraft designed with primary or simplified flight controls.

EASA asked what the airworthiness criteria would be to show § 22.105 compliance for eVTOL and powered-lift with fly-by-wire flight control systems. As explained in the NPRM, light-sport category aircraft would be required to meet the performance-based design, production, and airworthiness requirements in part 22 by using a means of compliance consisting of consensus standards accepted by FAA. FAA encourages consensus standards organizations for light-sport category aircraft, with FAA participation, to create necessary consensus standards for new aircraft types and classes, such as eVTOL aircraft and powered-lift, including those for fly-by-wire control systems. Normal protocol for consensus standards requires industry development and balloting

prior to FAA evaluation for acceptance. Accordingly, a technical discussion of fly-by-wire acceptance criteria is not appropriate here.

TCCA asked if a takeoff, climb, cruise, descent and landing at corner combinations of weight and center of gravity would be sufficient to meet § 22.105(a). To answer this question, FAA reiterates § 22.105(a) requires a light-sport category aircraft to be consistently and predictably controllable and maneuverable at all loading conditions during all phases of flight. Accordingly, a light-sport category aircraft would have to meet the § 22.105(a) requirements for all permissible aircraft weight and center of gravity combinations within the authorized flight envelope as specified in the aircraft's POH.

TCCA also asked for clarification on the meaning of "consistently" and "predictably" and its impact on subpart B requirements like stability, longitudinal, lateral and directional stability and control, and stall and spin characteristics. As title 14 does not specifically define these terms, consistently and predictably would generally have their ordinary meanings. A dictionary definition of "consistently" shows it generally means "marked by harmony, regularity, or steady continuity; free from variation or contradiction" and "predictably" generally means "in a manner that can be predicted; as one would expect."[55] Thus, a light-sport category aircraft's controllability and maneuverability should demonstrate regular, steady continuity that is free from variation and be predictable or as one would expect. The NPRM stated proposed § 22.105 would require light-sport category aircraft to be controllable and maneuverable with no adverse handling characteristics. In this context, no adverse handling characteristics would mean the aircraft would be consistently and predictably controllable and maneuverable and would not have a tendency to depart controlled flight inadvertently.

FAA notes that TCCA is referencing part 23 subpart B (flight performance and flight characteristics) in its question and not part 22 subpart B. In part 23, longitudinal, lateral, and directional stability requirements for airplanes not certified for aerobics are in § 23.2145 while airplane stall characteristics, stall warning, and spin requirements are in § 23.2150.

The § 22.105 controllability and maneuverability requirements apply to all classes of light-sport category aircraft and not just to airplanes as is the case for part 23. Some classes of light-sport category aircraft, such as rotorcraft and powered-lift, do not stall. For light-sport category aircraft, FAA-accepted consensus standards will act as the means of compliance to the § 22.105 controllability and maneuverability requirements. Therefore, FAA encourages consensus standards bodies for light-sport category aircraft to include appropriate standards for stability, stall, and spin, as applicable to the unique design features of each aircraft class. As discussed in the NPRM, FAA expects that some existing consensus standards may need updating due to the expansion of aircraft eligible for the light-sport category. In addition, consensus standards addressing aircraft controllability and maneuverability would need updating to address new requirements, including that aircraft control and maneuverability be consistent and predictable.

TCCA expressed concern that § 22.105(b) lacked a clear and distinctive stall warning requirement to warn of a potential loss of control. FAA agrees that § 22.105(b) does not require a stall warning system. As previously stated, certain light-sport category aircraft classes will not stall and therefore do not need a stall warning requirement. FAA supports the inclusion of a stall warning system and encourages consensus standards organizations for light-sport category aircraft to create stall warning system consensus standards for applicable aircraft classes to warn pilots of an impending stall. This would

increase safety by preventing stalls that could lead to an inflight loss of control accident. The NPRM did not propose or discuss potentially requiring the installation of stall warning devices and such equipage requirements would most appropriately be achieved through new notice and comment rulemaking.

AIR VEV commented that for the preamble description of proposed § 22.105 requiring no adverse effect on the aircraft's handling qualities is more restrictive than the proposed regulation text and seems unachievable. AIR VEV recommended that FAA clarify that § 22.105 allows for an acceptable amount of adverse effects. AIR VEV also recommended that FAA clarify that thrust asymmetry could occur in other multi-engine aircraft classes. FAA agrees the loss of an engine may cause an adverse effect on the aircraft's flight asymmetry through the air. However, to meet the standards of § 22.105, there should not be an adverse effect on the pilot's ability to provide proper inputs, using primary flight controls, to maintain directional control, i.e. the aircraft's handling qualities. For aircraft designed with simplified flight controls, automation maintains directional control, even during pilot interface, and is accordingly responsible for the handling qualities of aircraft. This scenario assumes the aircraft is within weight and balance limits and above stall and minimum control speeds, as applicable. For example, for twin-engine airplanes, a bank angle of not more than 5º toward the operative engine accompanied with rudder deflection toward the operative engine may be necessary to maintain straight flight at or above minimum control speed. In this scenario, some acceptable level of sideslip would likely accompany the 5º of bank. These control inputs are commonplace for twin-engine airplanes under asymmetric power. The intent of § 22.105 in this final rule, and as discussed in the NPRM preamble, is that there should be no adverse effect on the pilot's ability to make these necessary control inputs to

maintain directional control when under asymmetric thrust conditions. The precise condition of zero sideslip, determined by bank angle and rudder input, for twin-engine airplanes varies slightly from model to model and with available power and airspeed.[56]

With the loss of an engine, the provisions of § 22.105 would require the aircraft to not require exceptional piloting skill, alertness, or strength to maintain directional control. For aircraft designed with simplified flight controls, aircraft controllability would be automated, as would the handling qualities. For aircraft with primary flight controls, whether through the use of distributed thrust, a combination of aileron, rudder, and power inputs, or by other means, an aircraft must remain controllable and maneuverable through all phases of flight, which would ultimately permit a controlled, engine-out emergency landing.

Section 22.105 states, in part, that a light-sport category aircraft must not have a tendency to depart controlled flight inadvertently. Section 22.145 states, in part, that the aircraft propulsion system must be designed so the failure of any product or article does not prevent continued safe flight and landing or, if continued safe flight and landing cannot be ensured, the hazard has been minimized. Though a propulsion system failure may cause the aircraft to initiate an unplanned descent because loss of thrust no longer allows an aircraft to maintain altitude, the propulsion system failure must not result in a loss of control scenario where the pilot's ability to handle the aircraft is adversely affected. Aircraft control must still be maintained to allow flight, albeit a descent, to a more hospitable landing surface, if one exists. In this scenario, §§ 22.105 and 22.145 are being complied with since aircraft control is maintained after the propulsion failure. These §§ 22.105 and 22.145 requirements apply to all classes of light-sport category aircraft, regardless of whether the aircraft has one or more engines.

14. Structural Integrity (§ 22.110)

The provisions of § 22.110 require the design and construction of a light-sport category aircraft to provide sufficient structural integrity to enable safe operations within the aircraft's flight envelope throughout the aircraft's intended life cycle. An aircraft is also required to withstand all likely flight and ground loads, including towing and any aerial work operation, when operated within its operational limits. FAA made a conforming change in § 22.110(b) by changing "anticipated" in the NPRM to "likely" in the final rule. FAA has used "likely" in several similar instances in this part and the change standardizes the language without changing the intent of the requirement.

As discussed in section IV.F.16., proposed § 22.120 was omitted from this rule and aerial work operations were instead referenced in § 22.110. Based on public comment, FAA agreed the special requirements in proposed § 22.120 were already captured in § 22.110 and did not necessitate a stand-alone requirement for aerial work operations of light-sport category aircraft certificated prior to [INSERT DATE 365 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]. Though § 22.110 includes additional provisions for "safe operations within the aircraft's flight envelope and throughout the aircraft's intended life cycle," which were not included in proposed § 22.120, these concepts were included in the NPRM preamble for § 22.120. The NPRM preamble stated the aircraft's design and construction would need to be sufficient to protect against deterioration or loss of strength and prevent structural failures due to foreseeable causes of strength degradation that would be likely to occur throughout the aircraft's flight envelope during aerial work operations. In addition, the aircraft would need to be able to withstand all anticipated (changed to "likely" in this final rule) flight and ground loads during these operations without incurring detrimental

permanent deformation or jeopardizing the safe operation of the aircraft. Accordingly, the structural integrity requirements for an amended statement of compliance, as specified in § 21.190(e)(4), can be obtained from FAA-accepted consensus standards that act as a means of compliance to the structural integrity requirements in § 22.110 regarding aerial work operations.

Though listed in a separate requirement rather than as an aerial work operation in § 91.327, towing can put similar loads on aircraft structures as certain aerial work operations and has accordingly been included in the structural integrity requirement of § 22.110(b). As explained in section IV.F.16, FAA has already accepted ASTM consensus standards for glider towing for certain classes of light-sport category aircraft. FAA anticipates that these, or similar, design, construction, and performance requirements for applicable light-sport category aircraft used in towing operations will be included in consensus standards that act as a means of compliance to the § 22.110 structural integrity requirements. Since light-sport category aircraft manufacturers must currently state compliance to FAA-accepted consensus standards for the strength, structure, and installation requirements of towing-eligible aircraft, the addition of towing to § 22.110 is similar to existing procedures manufacturers already undertake to comply with design, construction, and performance requirements for towing aircraft.

TCCA commented that this section does not require or incentivize more robust designs, and it suggested revising the performance-based standards to ensure consensus standards contained incentives for greater structural robustness and durability. FAA disagrees with TCCA's suggestion. FAA specified "sufficient" structural integrity in § 22.110, rather than a measure of robustness, so as not to overprescribe the necessary robustness of aircraft structures. Excessive or unnecessary robustness can lead to

detrimental results such as an overweight aircraft. A specific provision or timeframe for durability is already captured in § 22.110 where it states that structural integrity must be sufficient for the aircraft's intended lifecycle. As a result of the performance expansions of light-sport category aircraft in this rule, the structural integrity provisions would require the development of consensus standards for light-sport category aircraft designs to address structural integrity under a wider range of environmental conditions and operational parameters. In addition, consensus standards would need to address the prevention of material and structural failures due to likely causes of strength degradation and protection against deterioration or loss of structural strength due to any cause likely to occur throughout the aircraft's lifecycle.

For example, the current design and construction consensus standard for light-sport category airplane materials in ASTM Standard F2245-20 states, "Materials shall be suitable and durable for the intended use. Design values (strength) must be chosen so that no structural part is under strength as a result of material variations or load concentration, or both." This consensus standard will need to be revised to reflect that the materials must be more than just suitable and durable for their intended use. The consensus standard will need to reflect that the materials must also provide sufficient structural integrity to enable safe operations within the aircraft's flight envelope and intended lifecycle and be able to withstand all likely flight and ground loads when operated within its operational limits.

FAA understands that ASTM consensus standards for light-sport category aircraft are international standards and may be applicable to other civil aviation authorities. The consensus standards do not need to repeat the regulatory language in part 22. Regardless of how the consensus standards are worded, the consensus standards must meet or exceed the intent of the part 22 requirements to gain FAA acceptance. FAA will evaluate the

consensus standards for structural integrity as a whole to ensure compliance with regulatory requirements.

Van's Aircraft and Streamline Designs recommended removing the phrase "intended life cycle" from proposed § 22.110. Van's Aircraft cited that keeping this requirement would drive up the cost and complexity of aircraft in this category and possibly deter some companies from the light-sport category. Van's Aircraft also stated older aircraft certificated under part 23 did not have to consider testing related to life limits, which would create an unfair competitive advantage with part 22 aircraft and that the standards used to design these aircraft were conservative enough that either issues did not occur or these issues were detectable in high time aircraft. Streamline Designs stated the intended life cycle requirement could lead to burdensome standards development and compliance.

FAA disagrees with Van's Aircraft claim that older certificated aircraft would have an unfair competitive advantage with part 22 aircraft. Just because a legacy model was certificated in the normal category under a different set of regulatory requirements does not mean it is automatically granted airworthiness certification in the light-sport category. A newly produced aircraft of a legacy model, not previously certificated in the normal category, will still have to meet applicable part 22 requirements and FAA-accepted consensus standards that act as a means of compliance to those requirements even if they are more rigorous than the airworthiness standards for the legacy model. Aircraft manufacturers of newly produced aircraft based on legacy designs will have to provide FAA with a SOC that specifies FAA-accepted consensus standards for light-sport category aircraft used to determine compliance with subpart B of part 22 and state that

the aircraft meets the eligibility, design, production, and airworthiness requirements of subpart B of part 22 in accordance with those consensus standards.

Of note, manufacturers could also choose to use FAA-accepted consensus standards for type certificated aircraft, such as those created by ASTM Committee F44 or other organizations, once those standards have been evaluated and found acceptable as a means of compliance to part 22 by FAA. The consensus standard would need to meet or exceed the part 22 requirements. FAA would have to publish the consensus standard in a NOA in the *Federal Register* and explain that FAA would accept the consensus standard for use with light-sport category aircraft. FAA does not negotiate a certification basis for light-sport category aircraft with an aircraft manufacturer. The manufacturer would either need to use FAA's accepted consensus standards for light-sport category aircraft or choose a different certification path. The manufacturer could also work with ASTM Committee F37 or another consensus standards body to submit the desired consensus standard to FAA.

FAA also disagrees with the recommendation to remove the phrase "intended life cycle" from § 22.110. FAA notes that light-sport category aircraft are not limited-use or consumable products, and their design should be subject to life cycle requirements. Also, § 22.110 does not specify a means of compliance for life cycle determinations such as the testing Van's Aircraft expressed concerns about. Consensus standards organizations may use various appropriate methods, or a combination thereof, to comply with this requirement.

Finally, a commenter advocated for this final rule to require four or more compartments or four or more rip stops with near double fabric strength to improve the structural strength of airships. This request is too prescriptive to be included in the

performance-based requirements in part 22 and is best resolved by consensus standards organizations for light-sport category airships.

15. Powered-Lift: Minimum Safe Speed (§ 22.115)

Section 1.1 defines powered-lift as a heavier-than-air aircraft capable of vertical takeoff, vertical landing, and low speed flight that depends principally on engine-driven lift devices or engine thrust for lift during these flight regimes and on nonrotating airfoil(s) for lift during horizontal flight. The provisions in § 22.115 require manufacturers of light-sport category powered-lift to establish the minimum safe speed for each flight condition encountered in normal operation, including applicable sources of lift and phases of flight, to maintain controlled safe flight. The minimum safe speed determination would be required to account for the most adverse conditions for each configuration. For this final rule, FAA made a correction in § 22.115 by removing "aircraft" from the proposed rule to correctly reference powered-lift and align it with the § 1.1 definition.

EASA asked how manufacturers should determine safe speed if the aircraft lacks full wing-borne lift or has automatic mode transition. To answer EASA's question, per the powered-lift definition, the aircraft must have nonrotating airfoil(s) that have the ability to primarily provide lift during horizontal, i.e., wing-borne, flight. Though the NPRM noted the wings of light-sport category powered-lift may be comparably smaller in size and have a resultantly higher stall speed than other aircraft classes such as airplanes and gliders, the wings must still principally provide lift during wing-borne flight. Therefore, manufacturers must be able to provide the stall speed in wing-borne flight, even if it is relatively high. If unable to do so, the aircraft would be identified as a rotorcraft during airworthiness certification.

In regard to EASA's question of automatic transition between modes, § 22.115 requires powered-lift to have a known minimum safe speed for each flight condition encountered in normal operations, including applicable sources of lift and phases of flight, to maintain controlled safe flight. A flight condition is a specific configuration used for a particular phase of flight. For instance, the powered-lift design could have a flight condition(s) for takeoff, climb-out, cruise, etc. Accordingly, each flight condition must have a minimum safe speed determined by the manufacturer. Whether automatic or pilot-in-the-loop transitions between flight conditions are used, manufacturers must comply with § 22.115 as appropriate for their design.

In relation to § 22.115, EASA also asked if there shall be failure evaluations and flight training for failure scenarios involving automatic transitions between modes. FAA notes that though failure evaluations are not specifically addressed in part 22, FAA would expect such evaluations are included in aircraft design considerations, quality assurance, ground and flight testing, and documentation for flight operations. Ensuring the aircraft has no hazardous operating characteristics is a requirement in § 22.195. In addition, § 21.190(c)(2) requires that each light-sport category aircraft application must provide FAA with a POH that includes operating instructions and limitations to safely accommodate all environmental conditions and normal, abnormal, and emergency procedures likely to be encountered in the aircraft's intended operations. The POH must also include a flight training supplement to enable safe operation of the aircraft within the intended flight envelope under all likely conditions, which would include engine or motor loss scenarios.

TCCA asked why the powered-lift minimum safe speed requirement only applies to powered-lift as opposed to conventional fixed wing aircraft. FAA agrees that fixed

wing aircraft are subject to minimum safe speeds too. Light-sport category airplanes are subject to the stalling speed or the minimum steady flight speed obtained in the V_{S0} configuration as specified in § 22.100. Multi-engine airplanes also have engine inoperative minimum control speeds, as previously discussed in section IV.F.6.p. However, FAA created the minimum safe speed requirement in § 22.115 to address the unique features of powered-lift.

3F expressed concern that powered-lift may be subjected to the airplane stall speed requirement because powered-lift eVTOL aircraft can operate like an airplane during certain flight modes and noted many eVTOL aircraft have a zero knot minimum safe speed during any flight mode. FAA does not anticipate any misapplication of the § 22.100 maximum stalling speed or minimum steady flight speed requirement for airplanes or the § 22.115 minimum flight speed requirement for powered-lift by an aircraft manufacturer. In addition, FAA disagrees with 3F's claim of a zero knot minimum safe speed for many powered-lift eVTOL aircraft during any flight mode. By definition in § 1.1, powered-lift must have a wing-borne flight phase by virtue of their nonrotating airfoil(s). Accordingly, the minimum safe speed could not possibly be zero knots for wing-borne flight where the wing (nonrotating airfoil(s)) is the principal source of lift. The powered-lift would have to transition out of wing-borne flight to a thrust-borne or hover mode to achieve a zero knot minimum safe speed.

16. Special Requirements for Light-Sport Aircraft used for Aerial Work Operations (§ 22.120)

The NPRM proposed in § 22.120 that for any light-sport aircraft[57] designated by the manufacturer as being suitable for the performance of any aerial work operation, the design and construction of the aircraft must provide sufficient structural integrity to

enable safe operation of the aircraft during the performance of that operation and ensure the aircraft is able to withstand any foreseeable flight and ground loads.

Several commenters disagreed with the need for this requirement. USUA was concerned that § 22.120 adds unnecessary regulation to aircraft that have a proven ability for aerial work flight and ground loads that are foreseeable. USUA asserted that current light-sport aircraft performing towing or flight training aerial work have sustained much greater loads. VAI, EAA, AOPA, NATA, and NBAA jointly asserted that, given the limited commercial operations allowed, they had difficulty imagining what additional standards are needed to safely allow these activities.

FAA disagrees with commenters that state a structural integrity requirement for aerial work is unnecessary. This requirement was proposed in part 22 so that consensus standards organizations would have the framework available to create consensus standards acceptable to FAA that address an aircraft's design and construction specifications for structural integrity requirements necessary to accomplish aerial work operations. To avoid having structural integrity requirements in two separate sections of part 22, this rule omits proposed § 22.120 from the final rule and instead references aerial work operations in § 22.110 as a point of emphasis. This change was previously addressed in section IV.F.14. Aircraft manufacturers must specify and state compliance to applicable consensus standards on the statement of compliance per § 21.190(d) or, for an amended statement of compliance, per the requirements in § 21.190(e).

FAA agrees with commenters that towing a glider or an unpowered ultralight vehicle and flight training may produce airframe load stresses that meet or exceed those of certain aerial work operations. FAA has accepted ASTM consensus standards for light-sport category aircraft used to tow gliders. These consensus standards address

structural integrity requirements for items such as tow equipment attachment points and the tow hook and can be found in the annexes of ASTM Standard F2245 for airplanes and for weight-shift-control aircraft, ASTM Standard F2317/F2317M, Standard Specification for Design of Weight-Shift-Control Aircraft. FAA encourages consensus standards organizations for light-sport category aircraft to similarly address structural integrity requirements of aerial work operations that involve high stress activities such as sling loads and liquid dispensing operations.

LAMA stated it expects that existing standards are acceptable unless safety data demonstrates that particular aerial work operation requires more design or testing. FAA disagrees with certain aspects of LAMA's statement. As has been previously discussed in the NPRM and preamble of this final rule, the existing consensus standards will need to be revised to account for the performance enhancements and part 22 requirements in this rule. Also, safety data will not likely exist for most aerial work operations, so some other criteria will likely be needed to determine which aerial work operations require development of consensus standards. FAA agrees that some aerial work operations, such as aerial surveying or photography, will not need additional structural integrity assessments as long as the aircraft has not been altered to perform these operations and is operated within the limitations in the POH. Any aerial work operation that does not exceed the operating envelope, weight and balance, or other design or performance limit of the aircraft as specified in the POH, and does not require alterations, should be able to be conducted by simply using FAA-accepted consensus standards for the design and structural integrity of the particular aircraft class. Aircraft manufacturers and consensus standards organizations for light-sport category aircraft must also consider repetitious or prolonged stresses in their evaluation of aerial work operations. Per § 21.190(c) in this

final rule, the manufacturer must include necessary instructions and limitations for any aerial work operations it lists in the POH. In addition, § 22.195 requires ground and flight testing of aerial work operations by the aircraft manufacturer and § 21.190(d) requires the aircraft manufacturer to state the aircraft has been ground and flight tested to ensure it can be operated safely while conducting the aerial work operations. Sections 21.190(d) and (e) also contain statement of compliance requirements for aerial work.

Van's Aircraft stated a preference for simplified requirements necessary for sufficient design safety margin under a design consensus standard for aerial work. Van's Aircraft asserted that the scope of aerial work proposed is limited with little effect on aircraft life and suggested avoiding rule language which would necessitate burdensome and expensive aircraft life limit studies. Similar to the response in § 22.110 for Van's Aircraft, the inclusion of a "life cycle" requirement is entirely appropriate for light-sport category aircraft. Aircraft produced under this rule are not single-use or consumable items. Instead, each aircraft is designed with some life span in mind. The rule does not specify a means of compliance to demonstrating the life cycle so various processes could be used such as a design guide, fatigue analysis, or even tests of representative articles.

17. Environmental Conditions (§ 22.125)

In § 22.125, the aircraft is required to have design characteristics to safely accommodate all environmental conditions likely to be encountered during its intended operations. Van's Aircraft recommended the removal of "environmental" from this requirement since "environmental" is addressed in another part 22 requirement. FAA disagrees with removing environmental from this requirement since doing so would make this requirement subject to all "likely" conditions, which would expand the scope of the regulation beyond environmental conditions. Such expansion could include certain errors

or poor techniques by pilots such as overstressing the aircraft because of hard landings, over-rotating the aircraft on takeoffs, or even losing directional control inflight or on the ground. In addition, the subtle difference between §§ 22.125 and 22.130 is that § 22.125 ensures the aircraft can operate inflight or on the ground under the likely environmental conditions for which the aircraft is designed, whereas § 22.130 ensures the materials used in the aircraft have the suitability and durability to withstand the likely environmental stresses or conditions expected in service.

18. Instruments and Equipment (§ 22.135)

In § 22.135, a light-sport category aircraft is required to have all instruments and equipment necessary for safe flight, including those instruments necessary for systems control and management. It also requires the inclusion of all instruments and equipment for the kinds of operations for which the aircraft is authorized. The aircraft's instruments, equipment, and systems must perform their intended functions under all operating conditions specified in the pilot's operating handbook. Any likely failure or malfunction of equipment or a system must not cause loss of aircraft control. All equipment and systems must be considered separately and in relation to each other.

FAA made a few corrections in § 22.135 to provide clarity. This rule separated proposed § 22.135(a) into two individual requirements making it easier to read and removed "also" in the newly created § 22.135(b) since it was unnecessary. In § 22.135(c), "aircraft" was changed to "aircraft's" to clarify that the aircraft's instruments, equipment, and systems must perform their intended functions. This change better aligns with the section title and contents of the requirement. None of these corrections changed the intent or meaning of the requirement.

Van's Aircraft expressed concern that proposed § 22.135(b), designated as (c) in this rule, requiring that systems and components must be considered separately and in relation to each other may lead to system assessments like those required for certified aircraft. Van's Aircraft asserted that the NPRM preamble discussion indicated a more reasonable approach and Van's Aircraft requested further clarification.

FAA agrees that the proposed wording of § 22.135(b) could have resulted in systems assessments equivalent to certified aircraft. This final rule replaces the word "component" with "equipment" in § 22.135 because the term component could include every individual item on the aircraft and a failure analysis could result in an impractical number of combinations to resolve. The term equipment is more commonplace and used in a similar, but more rigorous requirement for part 23 aircraft in § 23.2500.

In the NPRM, FAA stated manufacturers could use various methods to comply with this requirement such as the installation of back-up systems or through testing techniques. FAA encourages consensus standards organizations to create comprehensive solutions for the means of compliance to part 22 requirements. Though back-up systems may be effective for certain situations, they would be impractical to apply to all situations because of the added weight to the aircraft. Likewise, testing may be practical for certain systems and component assessments, but it may be excessive for others where an analytical analysis may be more beneficial.

Van's Aircraft also commented this standard still meets the correct intent even if "equipment" is removed. FAA disagrees with removing "equipment" from § 22.135. Instruments and equipment both need to be included in this requirement to ensure safe operations of the aircraft. "Instrument," as defined in § 1.1, is too narrow in scope to stand-alone in this requirement. However, the § 1.1 definition of "appliance" provides

that instruments and equipment are types of appliances that are used or intended to be used in operating or controlling an aircraft in flight, are installed in or attached to the aircraft, and are not part of an airframe, engine, or propeller.

The expansion of light-sport category aircraft classes provided by this rule may show differing equipment needs among the aircraft classes. In addition, certain authorized aerial work operations may require certain equipment for safe operations. Though this rule will remove the part 1 definition of consensus standard, the existing definition of consensus standard requires an industry-developed consensus standard for required equipment on light-sport category aircraft.

Van's Aircraft and Streamline Designs commented on how equipment impacts a light-sport category aircraft's weight and balance. Van's Aircraft stated the term equipment is for items within weight and balance whereas Streamline Designs stated equipment is for optional things that affect weight and balance. ASTM Standard F2746 states the weight and balance and equipment list section in the POH includes "installed optional equipment list affecting weight and balance or a reference as to where this information can be found." Though FAA does not approve the equipment list for light-sport category aircraft, any manufacturer-installed equipment for the model's standard configuration, as well as additional equipment added by the owner or operator, must be accounted for or identified on an aircraft's weight and balance so that the pilot can compute an accurate center of gravity. With the addition of new aircraft classes in the light-sport category and the expansion of the airplane class beyond single-engine airplanes, FAA encourages consensus standards organizations for light-sport category aircraft to develop appropriate consensus standards that address weight and balance considerations for these additional designs and configurations.

A few commenters discussed instrument flight rules (IFR) operations in light-sport category aircraft. One commenter stated light-sport category aircraft cannot fly into instrument meteorological conditions (IMC) unless moved to an experimental classification. FAA notes that ASTM Standards F2245 (for airplanes) and F2564, Standard Specification for Design and Performance of a Light Sport Glider, include a statement that limits these aircraft to visual flight rules (VFR) flight. Glider designs are also limited to day flight per their ASTM specification. ASTM has recently developed consensus standards for IFR operations that are planned to be published in the future. Operators of experimental former light-sport category aircraft should comply with any limitations or prohibitions on IFR flight or flight in IMC that were in the POH of their light-sport category model. Some aircraft engines used in light-sport category aircraft have limitations in the operating manual that specifically warn against operations in IMC.

Another commenter wanted the rule to permit IFR operations. This rule did not propose any limitations on equipment or operations that would prohibit light-sport category aircraft from conducting IFR flight or even flight in IMC. The NPRM acknowledged that light-sport category aircraft would be able to conduct IFR flight in IMC and likely be exposed to adverse weather conditions and operations at night. The NPRM explained that IMC flight would have to be authorized by the manufacturer in the POH and the aircraft would be subject to an operating limitation requiring the aircraft to be equipped to meet the equipment and instrumentation requirements in § 91.205.

ALPA recommended that light-sport category aircraft must comply with applicable § 91.205 instrument and equipment requirements if they are going to be allowed to operate IFR. FAA agrees and issues light-sport category aircraft an operating limitation with the airworthiness certificate that states, in part, IFR “operations are

authorized if allowed by the [aircraft operating instructions] and engine operating instructions and if the instruments specified in § 91.205 are installed, operational, and maintained per the applicable requirements of part 91."[58]

ALPA also stated light-sport category aircraft must comply with the airworthiness standards for instrument and equipment in parts 21, 23, 25, 27, 29, and 31 for the types of operations that certification is requested. FAA disagrees with this statement because the airworthiness standards in parts 21, 23, 25, 27, 29, or 31 are for type certificated aircraft that are higher on the safety continuum and accordingly have more rigorous certification requirements and greater privileges than light-sport category aircraft. The performance-based design, production, and airworthiness requirements in part 22, subpart B, were specifically created for non-type certificated aircraft that are issued special airworthiness certificates for the light-sport category. As stated in the NPRM, the performance-based requirements respond to the need to apply a set of broad-based requirements to a wider range of aircraft that would not be required to meet the more exacting design requirements of type certification. They also provide industry with the flexibility to develop consensus standards applicable to the certification of a wide range of dissimilar aircraft.

Aithre asked whether aircraft authorized by the manufacturer for flight ceilings above the legal requirement for oxygen must include installed oxygen equipment. Though part 22 does not require installation of oxygen equipment, as with all operating rules, the pilot or operator of the aircraft is responsible for ensuring compliance with operating regulations. Regarding the question raised in this comment, compliance with § 91.211 is required when exceeding the specified altitudes. Section 91.211 requires supplemental oxygen under specific circumstances but does not require "installed oxygen

equipment" specifically. For this scenario, if an aircraft can exceed the altitudes where supplemental oxygen is required, as specified in § 91.211, then these requirements can be met with either an installed oxygen system or portable oxygen bottles. If an aircraft manufacturer has installed an oxygen system, then the equipment must meet the § 22.135 requirements.

Aithre also asked related questions on topics such as oxygen delivery technology, oxygen sources, oxygen generation technology (e.g., pressure swing absorption (PSA) type) or pressurized vessel/cylinder types, and the use of real-time continuous measurements and feedback of blood oxygenation levels of the pilot and passengers. The means of compliance to these questions would be in FAA-accepted consensus standards for light-sport category aircraft, which have not been developed to date. Until consensus standards for oxygen systems for light-sport category aircraft have been developed, manufacturers may alternatively use applicable FAA-accepted consensus standards related to aircraft oxygen systems for type certificated aircraft, as long as they have received FAA acceptance for use in the light-sport category. As previously explained, FAA would have to release a NOA in the *Federal Register* authorizing FAA-accepted consensus standards for type certificated aircraft to be used for light-sport category aircraft.

Aithre also asked about whether carbon monoxide detectors are required equipment. Such detectors are not mandatory equipment in general aviation aircraft. FAA encourages owners to install carbon monoxide detectors on a voluntary basis.

19. Controls and Displays (§ 22.140)

This rule requires light-sport category aircraft to be designed and constructed so the pilot can reach controls and displays in a manner that provides for smooth and positive operation of the aircraft.

GAMA recommended that FAA clarify that single controls are allowable for all categories of light-sport aircraft and access to a single control meets this requirement even for aircraft with dual controls. FAA generally agrees with GAMA's recommendation. For aircraft with dual controls, it is not necessary for the pilot to be able to reach all controls and displays, especially those that repeat functions or information. FAA recommends industry organizations propose consensus standards for these types of design considerations for FAA acceptance. In addition, the NPRM stated the pilot had to reach all controls and displays in a manner that provides for smooth and positive operation of the aircraft. FAA determined that the word "all" was not necessary and omitted it in this rule. The removal of "all" from the requirement should assist in supporting GAMA's recommendation that access to a single control meets this requirement.

Though ALPA stated it supported the provisions of § 22.140, it recommended that light-sport category aircraft comply with certain airworthiness standards in subpart G of part 23 if they have more than two seats. FAA disagrees with ALPA's recommendation. Subpart G of part 23 contains airworthiness requirements for flight compartment instruments and equipment that the flightcrew interfaces with as well as requirements for the airplane flight manual. Much of the instruments and equipment, e.g., glass-panel avionics, found in normal category four-seat airplanes are also widely used in experimental amateur-built airplanes as non-certificated equipment. This non-certificated equipment has the same or similar functionality as the certificated version. Light-sport

category airplane manufacturers already use this non-certificated equipment in existing models and will continue to do so under this rule. Because of the wide-spread and long-standing use of non-certificated instruments and equipment in light-sport category and EAB aircraft, the more exacting requirements of part 23, subpart G, are not necessary for light-sport category aircraft operations. The level of rigor for the accessibility of controls and displays requirements in § 22.140 for light-sport category aircraft is appropriate.

20. Propulsion System (§ 22.145)

Light-sport category aircraft propulsion systems would be required to have controls that are intuitive, simple, and not confusing and be designed so that the failure of any product or article would not prevent continued safe flight and landing or, if continued safe flight and landing cannot be ensured, the hazard would be minimized. In addition, propulsion systems would not be permitted to exceed safe operating limits under normal operating conditions and would be required to have the necessary reliability, durability, and endurance for safe flight without failure, malfunction, excessive wear, or other anomalies.

A commenter was concerned about standardization of the propulsion system in relation to § 22.145 potentially limiting options. FAA disagrees with the generalization that light-sport category aircraft propulsion systems are being standardized as a result of this rule. This rule allows for the opposite; it removes the prescriptive limitation of a single, reciprocating engine for powered light-sport category aircraft contained in the existing § 1.1 definition of light-sport aircraft and allows any type or number of engines or motors. If the concern is that the rule requires “simple” propulsion system controls, then this provision is being added to the rule for safety, as explained in the NPRM. Propulsion controls that are complex may be confusing to the pilot or may delay

necessary power adjustments. Both scenarios could cause an accident. Consensus standards organizations for light-sport category aircraft will create the means of compliance for "simple" propulsion system controls, which should not be limiting for new forms of engines, especially electrical, as feared by the commenter.

AIR VEV commented that the preamble text does not reflect the rule, asserting that the preamble, for the safe flight and landing requirement, refers to a complete failure of the propulsion system whereas the rule refers to any failure of product or article of the propulsion system. AIR VEV recommended clarifying the preamble that safe flight and landing is required even for partial failures. FAA disagrees with AIR VEV's comment about the preamble text referring to a complete failure. The example provided in the NPRM to explain this provision stated, "The ability to maintain safe control of the aircraft in the event of a partial or complete failure of the propulsion system would significantly assist in reducing the probability of an accident or loss of aircraft control." The preamble for § 22.145 also included, "The results of this proposed requirement would not permit a partial or complete loss of power to adversely affect the handling qualities of an aircraft." Accordingly, FAA does agree that the severity of "the failure of any product or article" in § 22.145 could include a partial or complete failure.

Streamline Designs commented that "any product or article" and "the hazard has been minimized" in proposed § 22.145 are too vague. FAA disagrees that this language is vague. As noted in the NPRM, § 21.1(b) defines "product" to mean an aircraft, aircraft engine, or propeller and "article" to mean a material, part, component, process, or appliance. As to hazard language, the same is already contained in current § 23.2410 for powerplant installation hazard assessment, which was discussed along with an illustrative example in the propulsion section of the NPRM.

21. Fuel Systems (§ 22.150)

Light-sport category fuel system provisions in § 22.150 require a means to safely remove or isolate the fuel stored in the system from the aircraft and be designed to retain fuel under all likely operating conditions. This requirement applies to both liquid aviation fuel (e.g., avgas) and electrical energy, whether stored in batteries or produced by electric motors or other power generation devices.

Streamline Designs commented that the meaning of this section is unclear. FAA proposed this requirement because aviation fuel removal or isolation is necessary in the event fuel contamination is known or suspected or necessary for certain aircraft maintenance repairs. The fuel system must also be designed to retain fuel under all likely operating conditions, such as during all authorized maneuvers, turbulence encounters, accelerations and decelerations, and emergency descent and landing to ensure the safe and continuous operation of the aircraft's propulsion system. Fuel retention is necessary to prevent fuel from being a source of ignition or feeding an existing fire, maintaining the aircraft's center of gravity within prescribed limits, providing structural support, preventing loss of aircraft range and endurance, preventing equipment damage, preventing toxic fumes from entering occupied compartments, and preventing corrosion that could lead to structural damage. Consensus standards organizations for light-sport category aircraft will be responsible for creating the means of compliance to the fuel system requirements and obtaining FAA acceptance.

22. Fire Protection (§ 22.155)

Fire protection provisions in § 22.155 require the hazards of fuel or electrical fires following a survivable emergency landing be minimized by incorporating design features to sustain static and dynamic deceleration loads without structural damage to fuel or

electrical system components or their attachments that could leak fuel to an ignition source or allow electrical power to become an ignition source.

Streamline Designs suggested § 22.155 be changed to include other flammable liquids. FAA disagrees with this suggestion because it would make engine oil subject to this requirement. Though present in a limited quantity, oil is a flammable liquid and is used to lubricate certain engine parts and may be used as a hydraulic oil for controllable pitch propellers. Since oil is housed within the engine and propeller hub, if applicable, and is cycled through an oil cooler in the engine compartment, it would be difficult to isolate oil with fire protection provisions.

Streamline Designs also suggested "loads without structural damage" be changed to "loads without detrimental structural damage." FAA disagrees with this suggestion. The change is unnecessary because structural damage, regardless of its perceived severity, that would allow fuel to leak to an ignition source or allow electrical power to become an ignition source would be detrimental. For example, minor structural damage that allows fuel to leak to an engine source or allows electrical power to become an ignition source would be detrimental damage. Therefore, there is no reason to quantify the amount of structural damage for this requirement.

23. Visibility (§ 22.160)

Visibility provisions in § 22.160 require that the aircraft be designed and constructed so the pilot has sufficient visibility of controls, instruments, equipment, and placards. In addition, the aircraft design must provide the pilot with sufficient visibility outside the aircraft necessary to conduct safe aircraft operations.

Van's Aircraft and Streamline Designs recommended that the § 22.160 proposal replace "vision" with "visibility," with Streamline Designs concerned that the proposed

language would necessitate costly viewshed test or analysis. FAA agrees that visibility is the correct term to use for this requirement and that vision could be misinterpreted to be associated with a pilot physiological or medical ability. This final rule replaces "vision" with "visibility" in § 22.160. Consensus standards organizations for light-sport category aircraft will be responsible for creating the means of compliance to the visibility requirements and obtaining FAA acceptance. While a viewshed analysis is one method of compliance, other practical methods should be considered.

USUA and another commenter disagreed that the visibility requirements should apply to weight-shift-control aircraft. USUA recommended that the visibility requirement be changed so that it does not apply to "open cockpits." The other commenter stated many requirements would not work for its open cockpit environment. Neither commenter provided details or examples of why the visibility requirements would not apply to open cockpit weight-shift-control aircraft. Regardless, FAA disagrees with the commenter's generalizations that the visibility requirements should not apply. Though open cockpit weight-shift-control aircraft designs are simple, it is not unreasonable for instruments, equipment, controls, and placards to be sufficiently visible to the pilot, especially those essential to safe flight. For example, the minimum equipment requirements for weight-shift-control aircraft in ASTM Standard F2317/F2317M, as a means of compliance, are few. The specified equipment includes a fuel indicator or means to view the fuel quantity from the pilot seat. Engine instruments must be included if required by the engine manufacturer. If an electrical system is installed, then a master switch and overload protection devices must be installed. Finally, ASTM Standard F2317/F2317M states an airspeed indicator shall be provided to enable the pilot to comply with limiting airspeeds, unless V_H is less than V_A and less than V_{NE}. All of these items enable safe flight or safe

systems operations, and it would not be burdensome for manufacturers to provide the pilot with sufficient visibility of these items.

Doroni Aerospace and 3F both commented that current rules do not allow camera use in the cockpit and that cameras would improve aircraft safety in terms of allowing pilots to see below or behind them. Though cameras and camera displays are not prohibited, FAA does not agree that cameras could be used to meet the light-sport category aircraft visibility requirements. The pilot must have sufficient visibility outside the aircraft to conduct safe aircraft operations both on the ground and in the air. Cameras may be used to supplement the pilot's situational awareness by providing visual access to blind spots caused by aircraft structures. However, cameras cannot be solely relied upon by the pilot to conduct ground or flight maneuvers, search for and identify hazards, or comply with § 91.113 right of way rules. This is largely because the camera or display could fail, or the camera could become blocked or distorted by bugs, oil, precipitation, other airborne contaminants, or lighting. In addition, the acuity levels and field of view of most cameras are an inadequate substitute for human vision.

24. Emergency Evacuation (§ 22.165)

The provisions in § 22.165 require light-sport category aircraft to be designed and constructed so that all occupants can rapidly conduct an emergency evacuation. The aircraft's design would be required to account for conditions likely to occur following an emergency landing, excluding ditching for aircraft not intended for operation on water.

Van's Aircraft and Streamline Designs recommended removing the word "all" from proposed § 22.165(a)(2) so the requirement would not be more rigorous than the evacuation requirement in part 23. FAA agrees that inclusion of "all" makes the requirement more rigorous than that for normal category airplanes in § 23.2315, which

states, in part, "…in conditions likely to occur following an emergency landing…." Accordingly in the final rule, the word "all" has been removed from the requirement in § 22.165(a)(2). Despite the similar language, part 23 contains additional egress and emergency exit requirements that make it more rigorous than the evacuation requirements of part 22.

A commenter recommended that light-sport and experimental aircraft must meet some crashworthiness requirements of certified aircraft. FAA notes that the NPRM proposed some specific crashworthiness requirements for light-sport category aircraft in § 22.155 for fire protection and § 22.165 for emergency evacuation. FAA encourages light-sport aircraft manufacturers to incorporate crashworthiness features and the more rigorous design requirements of type certificated aircraft into their light-sport category aircraft designs. FAA encourages the same for manufacturers of EAB kits; however, these aircraft are outside the scope of this rule.

The performance-based requirements in this rule for light-sport category aircraft should not be more rigorous than found in the airworthiness standards for normal category airplanes and rotorcraft since light-sport category aircraft are lower on the safety continuum. This does not preclude consensus standards organizations from developing emergency evacuation consensus standards for FAA-acceptance that exceed the part 22 requirements. As previously discussed, light-sport category aircraft manufacturers may use crashworthiness consensus standards for type certificated aircraft as long as the consensus standard(s) meet or exceed any part 22 requirement, and FAA would have to accept the applicable consensus standard(s) for type certificated aircraft for use with light-sport category aircraft.

Another commenter recommended requiring manufacturers incorporate rollover protection for light-sport category aircraft with bubble canopies. Upon the implementation of this final rule, all light-sport category aircraft, even those with bubble canopies, must comply with the emergency evacuation requirements in § 22.165. ASTM Standard F2245-20 includes a crashworthiness consensus standard in an appendix for roadable airplanes that addresses rollovers. Consensus standards that act as a means of compliance to the emergency evacuation requirements will need to be developed for airplanes and other classes of light-sport category aircraft, including those with bubble canopies. Depending upon the design, aircraft manufacturers may need to provide tools or equipment that allow occupants to evacuate through a bubble canopy if no doors, hatches, or other means are available.

FAA notes that ASTM Standard F3083/F3083M-20a contains consensus standards for normal category airplanes that address emergency landing turnovers and anti-plowing and anti-scooping features. The ASTM Standard allows alternate approaches that achieve an equivalent, or greater, level of occupant protection if substantiated on a rational basis. FAA encourages consensus standards organizations to consider adoption of these consensus standards for occupant safety during a turnover or develop alternative approaches.

25. Placards and Markings (§ 22.170)

The provisions in § 22.170 require light-sport category aircraft to display all placards and instrument markings necessary for safe operation and occupant warning. Markings or graphics would be required to clearly indicate the function of each control, other than primary flight controls.

Streamline Designs asked for clarification on what the word "control" means. FAA declines to define "control" generally because of its broad application in different areas of aviation. However, application of this requirement to controls on an aircraft could generally include any switch, button, knob, lever, throttle, circuit breaker, or other device that allows the pilot to interface with the aircraft to perform a function. Primary flight controls could include items such as a stick, cyclic, yoke, control column, rudder pedals, or similar devices that allow the pilot to manually control the pitch, roll, or yaw of an aircraft through hand or foot coordination.

Streamline Designs also recommended requiring display markings in § 22.170. FAA disagrees with marking all displays. Many avionics displays are multi-function displays and provide various types of information to the pilot based upon which "page" the pilot is looking at. Each page usually includes information for a specific function or purpose, such as temperature and wind data for flight planning, cruise airspeeds, elapsed or estimated time enroute, fuel quantity, fuel burn, alternate airfields, or engine performance. Requiring a display to be generically marked as a multifunction display adds little value. Avionics displays and their control knobs or buttons are marked accordingly by the avionics manufacturer and the aircraft manufacturer should not have to provide further markings in most cases.

26. Noise (§ 22.175)

The proposal for § 22.175 required light-sport category aircraft to meet the applicable noise standards of part 36 of this chapter. Since this final rule makes compliance with part 36 for new light-sport category aircraft voluntary (see section IV.N), this final rule omits proposed § 22.175 but will instead label it as "reserved."

Streamline Designs and AIR VEV recommended that this section should require compliance with an accepted noise consensus standard rather than part 36. Similarly, GAMA recommended removal of part 36 noise requirements and the use of FAA-accepted consensus standards for noise compliance, if necessary. Desert Aerospace asserted there are a limited number of turbine LAS aircraft operating and they would not present significant noise problems. It recommended that FAA consider allowing such flights even if there are issues in their ability to meet noise requirements. These recommendations would have required FAA to create noise requirements outside of the existing part 36 framework and would eliminate the ability of light-sport aircraft to comply with traditional noise requirements, reducing their options for compliance. Since proposed § 22.175 is not included in this final rule, these comments are no longer relevant. If a manufacturer chooses to voluntarily comply with part 36, FAA agrees that meeting an FAA-approved noise consensus standard is one way a light-sport category aircraft will be able to meet part 36 requirements. However, FAA considers part 36 to be the proper place for that provision.

One commenter asserted there is insufficient evidence that light-sport category aircraft are a large factor in airplane noise complaints. This individual asserted that applying part 36 to these aircraft would require them to be quieter than older type certificated aircraft, thus creating additional burden, and discouraging new aircraft development without benefit to the public. Since proposed § 22.175 is not included in this final rule, and this final rule makes compliance with part 36 voluntary for applicable non-type certificated aircraft, this comment is no longer relevant.

27. Aircraft Having Simplified Flight Controls (§ 22.180)

FAA proposed that an aircraft meeting the three requirements in § 22.180 could be designated by the manufacturer as having simplified flight controls. Not all light-sport category aircraft will be designed with simplified flight controls, so compliance with this section is contingent upon the aircraft having the simplified flight controls designation. One advantage of designing an aircraft with simplified flight controls is that the pilot training requirements are significantly reduced, as discussed in section IV.H.2.

a. Comment on Defining Simplified Flight Controls

AEA/ARSA recommended including a universal definition of simplified flight controls for all aircraft because it could be applicable across all designs. FAA disagrees with the recommendation. This rule will not define simplified flight controls to avoid limiting the development and design of automated technologies for aircraft certification categories higher on the safety continuum. A definition of simplified flight controls may be more prescriptive than the performance-based requirements in § 22.180, which would make compliance more difficult. A prescriptive definition may also make the development and adoption of future technologies more difficult, which should be avoided.

b. Clarification of Simplified Flight Control Design

Jump Aero and AIR VEV proposed specific language changes to § 22.180. They proposed revising § 22.180(a) to require that aircraft are consistently and predictably controllable and maneuverable using simplified flight controls at all loading conditions and phases of flight. Though Jump Aero and AIR VEV correctly noted § 22.105 does not address aircraft with simplified flight controls, FAA disagrees with their proposal and has provided an alternative solution in this final rule. FAA has removed "through the normal use of primary flight controls" in § 22.105(a) making the requirement agnostic to primary

or simplified flight controls. Thus, § 22.105(a) will read, "Be consistently and predictably controllable and maneuverable at all loading conditions during all phases of flight." The requirements of § 22.105 apply to all light-sport category aircraft classes and with this change, there is no need to repeat these specific provisions in § 22.180 as the commenters proposed. Accordingly, the commenters' proposed § 22.180(a) was not included in this final rule.

Jump Aero and AIR VEV suggested revising § 22.180(c) to require that the pilot control scheme, during abnormal flight control modes, be consistent with its normal mode. Jump Aero asserted that the means of controlling the aircraft should not change even in the event of systems failures that are extremely likely. Though FAA generally agrees that consistency of aircraft control is important during normal and abnormal operations, FAA disagrees with including this suggestion as a requirement in § 22.180 on the grounds that it is unnecessary since automation controls the aircraft's flight path rather than primary flight controls reliant upon a pilot's hand and foot coordination. Automation allows for variances in programming normal and abnormal operations. Of note, § 22.180(b) will include a requirement that regardless of pilot input, the aircraft is designed to prevent loss of control under likely circumstances. This requirement should instill confidence in automation's capacity and correct for inefficient interface designs or poor decision making by the pilot. Since aircraft with simplified flight controls may have greater varieties of interface devices for the pilot to use, the human factors aspect of these interface devices will be critical to allow effective, simple, logical, and timely pilot inputs. These types of design choices are best fulfilled by industry-developed consensus standards.

Jump Aero and AIR VEV suggested adding § 22.180(d) to require that aircraft with automated systems or some combination of pilot action and automation must ensure that pilots can discontinue or alter the aircraft trajectory. FAA notes that much of this proposal is already captured in § 22.180(a) and (c) of this final rule. Automation that controls the flight path and available power is included in § 22.180(a) and a means to discontinue or alter the aircraft's flight is included in § 22.180(c). FAA disagrees with the use of certain phrases in the commenters' proposal because they are not aligned with the simplified flight control design concept. For instance, their suggested use of "include automated systems" is inadequate. Aircraft with simplified flight controls are fully automated for controlling the flight path and available power, which means automation is also used to inherently prevent loss of control under likely circumstances, regardless of pilot input. If the pilot wants to discontinue or alter the flight, then automation controls the flight path of these functions. FAA has concerns that the phrase "some combination of pilot action and automation" could be misinterpreted to mean that primary flight controls are permitted in the designs of aircraft with simplified flight controls, which is not the intent of § 22.180. After considering Jump Aero and AIR VEV's suggestion and other public comments, FAA decided to not use Jump Aero and AIR VEV's suggestion for § 22.180(d) but instead use the requirements in § 22.180(a) and (c) of this final rule.

Both AIR VEV and Jump Aero stated proposed § 22.180 was too prescriptive. Though the commenters did not provide specific examples, FAA disagrees. The performance-based requirements in § 22.180 balance the need for safety with the differing requirements of simplified flight control designs for light-sport category aircraft. Consensus standards organizations should be able to create appropriate consensus standards that act as a means of compliance to these requirements and provide

industry solutions that address the automation, pilot interface, operational and safety functions (such as prevention of loss of control and the means to discontinue or alter the flight), and other criteria unique to aircraft with simplified flight controls.

GAMA agreed with Jump Aero and AIR VEV's recommended § 22.180(b), (c), and (d), but recommended that (a) should require that the aircraft's motion is commanded by the pilot's flight control inputs. GAMA commented that the proposed § 22.180 is overly prescriptive and focuses on minimum functionality instead of a performance-based safety objective consistent with § 22.105, which would allow for different means of compliance and potential future technological advancements.

Furthermore, GAMA and AIR VEV commented that how the pilot manipulates commands is irrelevant if the aircraft design prevents loss of control irrespective of pilot input, noting that an automation system can override pilot input even in a traditional cable and pully system. GAMA recommended that FAA allow pilot controls that resemble traditional or primary flight controls in aircraft designated as having simplified flight controls. GAMA commented that the NPRM preamble suggests that simplified flight control aircraft cannot have traditional controls, but that proposed § 22.180 rule remains silent on what pilot cockpit controls can be used. GAMA asserted that aircraft with traditional controls that have carefree handling characteristics, allow real time and direct control over flight attitude and trajectory, with sustained hands-off stability and full envelope protection, and which meets any other § 22.180 requirements should be able to receive a simplified flight control designation. GAMA illustrated its position with a light-sport helicopter example that it believes should be eligible for simplified flight control designation. GAMA provided some other comments on this topic related to sport pilots that are addressed in the sport pilot certification section.

As discussed in the NPRM preamble for the part 22 control and maneuverability requirement, primary flight controls consist of traditional flight controls, such as an aircraft yoke, stick, control column, collective, throttle, or rudder pedals. The proposed rule contained specific provisions for the certification of aircraft that are designed and constructed without primary flight controls, but rather with simplified flight controls. These statements make clear that the intent for § 22.180 is for aircraft not to have primary flight controls but for such aircraft to have a simplified flight control designation. Light-sport category aircraft manufactured under this rule will either have primary flight controls or simplified flight controls. The proposed § 22.180 language captured FAA's intent to exclude primary controls by stating "without direct manipulation of individual aircraft control surfaces." Regardless, FAA disagrees with GAMA's interpretation of simplified flight control designs. FAA finds the commenters' § 22.180(a) proposal that the pilot's flight control inputs command (GAMA proposal) or directly command (see comments from Cirrus Aircraft on the docket) the desired aircraft motion contradicts the intent of § 22.180 for aircraft whose operation solely relies on automation and only allows the pilot to intervene through non-traditional means. This suggestion and GAMA's proposal are further addressed in the paragraphs below.

In addition, for FAA's § 22.180(a) proposal, Cirrus Aircraft asked FAA to clarify the intent of: (1) "control the flight path," (2) the word "only" before control the flight path, and (3) "without direct manipulation of individual aircraft control surfaces or adjustment of the available power" or "adjustment of available power." Cirrus Aircraft stated, "control the flight path" could imply a general or specific type of kinematic control. For the second request, Cirrus Aircraft stated the NPRM indicates simplified flight control pilots are only expected to be proficient at those controls and may not be

capable of traditional flight controls. For the third request, Cirrus Aircraft asked if simplified flight controls exclude traditional mechanical flight controls and fly by wire direct control systems.

In response to GAMA, Cirrus Aircraft, and other commenters, FAA has revised § 22.180(a) in this rule to more precisely clarify the intent of simplified flight control designs. Section 22.180(a) now reads, "The aircraft's flight path and available power are automated, allowing the pilot to only intervene without the availability of primary flight controls."[59] This performance-based requirement better clarifies that aircraft with simplified flight controls are fully dependent upon automation while allowing a means for the pilot to intervene with the automation, rather than a pilot's hand-flying skills, to control the aircraft's flight path and available power. This requirement also clearly demonstrates that the pilot is allowed to intervene through means that interface with the automation, i.e., without the availability or presence of primary flight controls, to discontinue or alter the flight path of the aircraft as referenced later in § 22.180(c). Pilot intervention could include adjustment of the aircraft's automated available power through interfaces such as touch screens, pushbuttons, or rotating knobs. The proposed clause "in its operation" was omitted from § 22.180(a) in this rule because the meaning of the provision is clear without it being included, i.e., controlling an aircraft's flight path and power is the same as operating it.

To address Cirrus Aircraft's requests, the revised § 22.180(a) should now provide greater clarity that automation that allows pilot intervention, not pilot primary flight control inputs, is what controls the aircraft's flight path and available power. The revised § 22.180(a) also clarifies that primary flight controls are not available on aircraft with simplified flight controls. To avoid being overly prescriptive on how to comply with

these requirements, FAA encourages industry participation for the development of appropriate consensus standards to address design, production, and airworthiness aspects of necessary automation and specialized technologies for automated flight path and power control that also include inherently preventing loss of control under likely circumstances, regardless of pilot input. The development of appropriate consensus standards for the pilot's ability to interface with the aircraft's automation to fulfill the necessary functions of aircraft normal, abnormal, and emergency operations will also be necessary.

Regarding Cirrus Aircraft's comment that certain pilots may only be expected to be proficient at aircraft designs with simplified flight controls and may not be capable of traditional flight controls, FAA agrees that this is the intent of the requirements in this rule. Aircraft with simplified flight controls must only allow the pilot to intervene with the automation, other than with primary flight controls, to change the aircraft's trajectory or power. This means that the pilot training requirements necessary to operate aircraft with simplified flight controls are not as extensive as training requirements for aircraft with primary flight controls. Training on aircraft with primary flight controls is unnecessary if a pilot only desires to fly light-sport category aircraft with simplified flight controls.

The purpose of § 22.180 is to respond to industry and manufacturers designing and producing fully automated aircraft that allow for simple, non-traditional means for the pilot to interface with the aircraft's automation. Such aircraft are completely dependent upon automation, sensors, and other technologies for flightpath and power control, even when pilot intervention is accomplished, rather than a pilot's hand-flying skills. This rule would not prevent light-sport category aircraft designs with primary

flight controls or a combination of automation and primary flight controls. FAA strongly encourages manufacturers to include envelope protection and stability augmentation features, even in aircraft designed with primary flight controls. However, manufacturers could not designate these aircraft designs as having simplified flight controls on the manufacturer's statement of compliance as required by § 21.190(d)(4) of this rule.

c. Clarification of Joy-Stick Controllers

TCCA expressed uncertainty as to what "select flight commands" means in the NPRM discussion of simplified flight controls and how this differs from "controlling the aircraft" with fly by wire sidestick controllers. Cirrus Aircraft also requested clarification on the use of joystick controllers and whether they would qualify for simplified flight control status.

A pilot-operated joystick, similar to the side-stick controllers found in certain part 23 and 25 airplanes, would not be found in an aircraft with simplified flight controls since the joystick or side-stick controller is a type of primary flight control. As previously discussed, the revised § 22.180(a) in this rule provides the necessary clarity for this. Though FAA agrees that the technology of fly-by-wire systems could be included in aircraft with simplified flight controls, the differentiator is that the presence of primary flight controls does not exist in aircraft designs with simplified flight controls.

However, as the NPRM discussed, joystick controllers used to select flight commands or move a cursor on a display would be appropriate for a simplified flight control design. This type of joystick would likely be used intermittently to select any necessary heading, course, altitude, or airspeed corrections to the preprogrammed route of flight. It could also be used to move a cursor to select items displayed on an electronic chart; either enabling a flight mode or obtaining additional information. These corrections

or selections could be in response to situations such as hazard or unexpected weather avoidance.

d. Prevent Loss of Control for All Likely Circumstances

The NPRM noted, if used in the design, automation would have to prevent loss of control of the aircraft under all circumstances. TCCA requested clarification of "all circumstances," and suggested "likely" needed to replace "all" if "circumstances" included environmental, operational, and failure conditions. Alternatively, TCCA thought it seemed too limited if "circumstances" only covers the range of pilot inputs.

FAA agrees that "likely" should have been included in the NPRM sentence to account for likely circumstances, without making it an absolute criterion that is unachievable as noted by TCCA. In addition, FAA will broaden the scope of § 22.180(b) so that it is not interpreted as only being applicable to pilot inputs. This will help clarify that aircraft control is also maintained through automation during engine loss or asymmetrical power scenarios. In this final rule, § 22.180(b) reads: The aircraft is designed to inherently prevent loss of control under all likely circumstances, regardless of pilot input.

e. Clarification on Maintaining Aircraft Control and the Use of Aircraft Parachutes

In the NPRM, proposed § 22.145(b) stated the aircraft propulsion system must be designed so that the failure of any product or article does not prevent continued safe flight and landing or, if continued safe flight and landing cannot be ensured, the hazard has been minimized. Proposed § 22.180(b) and (c) stated the aircraft is designed to inherently prevent loss of control, regardless of pilot input, and the aircraft has a means to enable the pilot to quickly and safely discontinue the flight and prevent any inadvertent activation of this feature.

Doroni Aerospace and 3F commented that §§ 22.145(b), 22.180(b), and 22.180(c) are contradictory for powered-lift. They stated for powered-lift, a complete or partial loss of propulsion could result in being unable to control the aircraft's descent. They also stated for aircraft that lack control surfaces, it could result in complete loss of control. They suggested automatic, semi-automatic, or manual emergency ballistic device may help satisfy § 22.145(b) in such scenarios. Doroni Aerospace and 3F were concerned that § 22.180(b)'s requirement that the aircraft is designed to inherently prevent loss of control, regardless of pilot input, works against pilots being able to deploy emergency ballistic devices. They stated § 22.145(c) contradicts §§ 22.180(b) and 22.145(b) regarding emergency procedures associated with loss of control. Doroni Aeropsace recommended clear emergency ballistic device guidance in these regulations for aircraft with simplified flight controls and powered-lift.

FAA disagrees with Doroni Aerospace and 3F's interpretation of the requirements in § 22.180. As previously explained, the final rule has changed the § 22.180(b) requirement to prevent loss of control under likely, rather than all, circumstances, regardless of pilot input, and changed § 22.180(c) to read, "The aircraft has a means to enable the pilot to quickly and safely discontinue or alter the flight and prevent any inadvertent activation of these functions." Accordingly, aircraft designs that cannot meet the § 22.180(b) requirement that the aircraft inherently prevent loss of control under likely circumstances cannot be designated by the manufacturer as having simplified flight controls. In addition, § 22.135 requires aircraft control to be maintained in the likely event of a failure or malfunction of a system or component.

Aircraft with simplified flight controls must be designed with sufficient automation to prevent loss of control under likely circumstances to include partial and

complete loss of propulsion. To achieve this requirement, the powered-lift designs could use autorotation, distributed propulsion, wing surface area to control glide rate of descent, other measures appropriate for the design, or a combination of these measures to account for each flight condition.

Though FAA encourages manufacturers to add safety equipment such as ballistic parachute recovery systems, such a parachute or system, by itself, is not an acceptable means of compliance for the §§ 22.135 or 22.180(b) requirements. For aircraft designed with simplified flight controls, the intended outcome of §§ 22.135 and 22.180(b) is to require aircraft control to be maintained until the automation or pilot intervention (via automation) brings the flight to a logical and safe conclusion. The aircraft must have this ability even if the aircraft manufacturer installs a ballistic parachute recovery system on the aircraft. FAA understands the desire to use a parachute with powered-lift to minimize the hazards of partial and complete engine failure. However, ballistic parachute recovery systems do not provide full protection of the flight envelope since the parachute requires a certain height above the ground before it can fully deploy.

FAA disagrees with Doroni Aeropsace's and 3F's interpretation that the pilot's deployment of an aircraft parachute would violate § 22.180(b). The deployment of an aircraft parachute is a separate function and not related to the pilot's interface with the aircraft's automation that is described in § 22.180(b).

FAA also disagrees with Doroni Aerospace's and 3F's interpretation on the level of training of a pilot, such that they have limited knowledge and experience to determine the need to deploy a parachute in emergency procedures. If a light-sport category aircraft is designed with an aircraft parachute, then § 21.190(c)(2) requires the manufacturer to provide a POH that includes operating instructions and limitations to safely accommodate

all environmental conditions and normal, abnormal, and emergency procedures likely to be encountered in the aircraft's intended operations. This means the pilot can obtain necessary operating instructions and limitations of the aircraft parachute from the POH.

f. Clarification on "Discontinue the Flight Path"

The NPRM discussed examples of actions that could qualify as discontinuing or suspending a flight under § 22.180, including an immediate landing, a return flight to the aircraft's point of departure, a diversion to an alternate landing site, a course change, or initiation of a low altitude orbit or in-place hover until any hazards have passed.

Cirrus Aircraft stated these examples are ad hoc flight path changes. Cirrus Aircraft and Streamline Designs recommended that FAA clarify the meaning of § 22.180(c), with Cirrus Aircraft noting § 22.180(a)'s requirement that pilots "control the flight path" in questioning the clarity of § 22.180(c) and Streamline Designs asking the meaning of "discontinue the flight." Skyryse commented that requiring the pilot to be able to "quickly and safely discontinue the flight" fails to reflect practical operational experience, as discontinuance may not be the most appropriate or safest action that a pilot can take in the event of an unforeseen event. It noted the example actions from the NPRM discussed above as options available to a pilot where circumstances preclude the completion of a mission as planned. Skyryse stated the NPRM preamble uses the terms "suspend" and "discontinue," implying a broader range of pilot options while the NPRM regulatory text does not. Reliable Robotics similarly commented on proposed § 22.180(c), stating it could be overly prescriptive and require additional capabilities given the differences between simplified flight control technologies. It stated requiring these systems to allow the pilot to "control the flight path" and to "discontinue or suspend" the flight could significantly increase complexity.

FAA agrees that "discontinue" is too narrow of scope to capture the practical example actions discussed in the NPRM preamble that included a course change, or initiation of a low altitude orbit or in-place hover until any hazards have passed. However, "suspend" may also be too narrow as it only implies an orbit, holding pattern, or in-place hover. Instead, the final rule will change § 22.180(c) to include the term "alter" so that it reads, "The aircraft has a means to enable the pilot to quickly and safely discontinue or alter the flight and prevent any inadvertent activation of these functions." Altering the flight reflects more viable options that could include an orbit, holding pattern, in-place hover, course change, or an offset while still proceeding to the original destination. It also better describes a diversion to an alternate airfield or landing site. Note that FAA changed the word "feature" to "function" as recommended by Streamline Designs since "functions" (plural) better describes the actions of discontinuing or altering the flight.

In response to Reliable Robotics's comment that an additional requirement to "discontinue or suspend" the flight could add significant complexity, the automation in simplified flight control designs must be able to perform the same flight functions as a pilot. If smoke or fumes suddenly appeared in the occupant compartment, the design must allow the pilot to interface with the automation so that the flight could be discontinued or altered, if necessary, such as accomplishing a pilot-initiated divert to a suitable landing site. If the smoke or fumes were significant enough, automation must allow the pilot to initiate an immediate land now function. The aircraft design must be able to handle this and similar emergency or abnormal scenarios necessary for the safety of the aircraft and occupants.

g. Clarification on "Inadvertent Activation"

Skyryse suggested deleting the phase "inadvertent activation of this feature" from proposed § 22.180(c) as ambiguous since a single "feature" may not support all responses to unforeseen events. As previously discussed, FAA changed "feature" to "function" in § 22.180(c) since "functions" better describes the actions of discontinuing or altering the flight. FAA disagrees with removing "inadvertent activation of these functions" since protecting inadvertent activation of equipment that performs critical functions is a safety feature of the aircraft. This safety feature could prevent the pilot from inadvertently putting the aircraft in a dangerous situation such as turning the aircraft toward higher terrain, an obstacle, or airborne hazards such as birds or other aircraft. Inadvertent activation of an immediate landing mode, if applicable, may result in damage to the aircraft or injury to occupants if over rugged or unsuitable terrain.

h. Simplified Flight Controls are too Technical for the Light-Sport Category

ALPA did not support simplified flight control systems for light-sport category aircraft. It asserted such highly automated, technically advanced flight control systems for light-sport aircraft may add an unquantified risk, with little to no mitigation. ALPA cited an FAA notice (77 FR 38463) (LSAMA Notice) related to the LSAMA Final Report. The LSAMA Notice described FAA's concerns over manufacturing facilities' ability to substantiate, through the issued statements of compliance, that aircraft met the applicable consensus standards.

FAA-accepted consensus standards have been created for a broad array of aircraft classes that include airplanes, gliders, lighter-than-air, weight-shift-control, and powered parachutes. The NPRM affirmed that the success of the light-sport category, including its reliance on a statement of compliance to FAA-accepted, industry consensus standards. This success serves as a sufficient basis for expansions of this category using the same

certification concepts and procedures, including optional designs that include simplified flight controls. For instance, ASTM F37 Committee on Light-Sport Aircraft could work with ASTM F38 Committee on Unmanned Aircraft to obtain best practices and specialized knowledge on common technologies. In addition, this rule will include mitigations to decrease risk, such as limiting light-sport category aircraft to two seats, except four seats for airplanes, enabling more robust structures and safety equipment through the removal of a weight limit, and not allowing the carriage of non-essential persons and cargo for compensation or hire, except for flight training.

In response to the LSAMA Final Report, a requirement for the training of manufacturer's employees to ensure they understand how to determine compliance to applicable consensus standards is included in this rule in § 22.190. In addition, § 21.190(d) requires the manufacturer's statement of compliance to be signed by the manufacturer's authorized representative who is certified and trained on the requirements associated with the issuance of a statement of compliance by an organization that certifies and trains quality assurance staff in accordance with a consensus standard that has been accepted by FAA. These provisions are intended to correct the concerns identified in the LSAMA Final Report.

i. Development of Consensus Standards for New Classes

A commenter proposed removing the simplified flight controls requirement for helicopters under § 21.190 because it is inconsistent with other aircraft categories' requirements, and such technology is still developmental and would delay new helicopter certification. The commenter asserted that this removal would allow a realistic ASTM certification basis with existing technology and allow existing EAB helicopter designs to be revised to comply with industry mechanical practices and certified.

FAA notes there are a few misconceptions in the commenter's remarks. First, § 21.190 does not contain a restriction on simplified flight controls for helicopters. Instead, this restriction is in part 61 and only applicable to sport pilots. Second, light-sport category helicopters may be designed with or without simplified flight controls, so the development of consensus standards for the § 22.180 requirements will not impede new helicopter certification. Granted, it will take time for certain types of aircraft, such as helicopters, gyroplanes, and powered-lift, to achieve airworthiness certification in the light-sport category as consensus standards are developed for these aircraft. It is up to industry as to when consensus standards for simplified flight controls will be developed for each aircraft class, as applicable.

j. Altered Aircraft

VAI commented that the rule should allow for currently manufactured or existing rotorcraft to have equipment installed that could achieve performance-based standards of simplified flight control designs. VAI recommended traditional rotorcraft be given a simplified flight control designation if altered through approved and installed advanced control augmentation systems. Though standards and procedures for type certification are outside the scope of this rule, an applicant may request FAA approval for such designs via the provisions in part 21 for type certificates, changes to type certificates, or supplemental type certificates, including the provision in § 21.16 for requesting special conditions for novel or unusual design features such as simplified flight controls. If FAA approved a design for simplified flight controls, the holder of that design approval would be able to designate aircraft that incorporate that design as having simplified flight controls.

k. Question on Consensus Standards Acceptance Criteria

EASA asked for clarity on the acceptance criteria for simplified flight control systems. FAA will evaluate any consensus standards on simplified flight controls to verify they meet the requirements of § 22.180 prior to FAA acceptance. Simplified flight control consensus standards will contain the specific means of compliance for simplified flight control designs.

28. Quality Assurance System (§ 22.185)

As explained above in the § 22.100 section, some of the proposed eligibility requirements were changed or omitted in this final rule to clarify that aircraft manufactured outside the United States had to meet the light-sport category eligibility requirements of § 22.100(a) and (b). EASA asked if compliance with proposed § 22.100(b)(1) includes compliance with § 22.185 since the requirement applies more to manufacturers and staff competencies than the aircraft itself. FAA notes that proposed § 22.100(b)(1) has been omitted from this final rule, as explained in the § 22.100 section. Instead, the requirement that the aircraft meet the requirements of this subpart, as stated by proposed § 22.100(b)(1), is now under § 22.100(a)(7) in this final rule. Section 22.100(a)(7) states that the aircraft meet the design, production, and airworthiness requirements specified in this subpart using a means of compliance consisting of consensus standards accepted by FAA. Accordingly, since the requirement of § 22.185 is written as a requirement on the aircraft, FAA affirms that compliance with § 22.100(a)(7) requires compliance with § 22.185 since the aircraft must have been designed, produced, and tested under a documented quality assurance system to ensure each product and article conforms to its design and is in a condition for safe operation.

As specified in § 21.190(d)(5), an applicant for a special airworthiness certificate under § 21.190 must provide FAA with a statement of compliance from the aircraft

manufacturer that shows compliance to FAA-accepted or approved consensus standards that act as the means of compliance to the design, production, and airworthiness requirements of subpart B of part 22. In addition, the statement of compliance includes a statement from the manufacturer that they have established and maintain a quality assurance system that meets the requirements of § 22.185 of this chapter and the aircraft conforms to the manufacturer's design data, using the manufacturer's quality assurance system that meets the specified consensus standard. These requirements are in § 21.190(d)(11) and (6), respectively.

29. Findings of Compliance by Trained Compliance Staff (§ 22.190)

Section 22.190 requires a light-sport category aircraft to have been found compliant with the provisions of the applicable FAA-accepted or approved consensus standards by individuals who have been trained on determining compliance with those consensus standards. EASA asked if compliance with proposed § 22.100(b)(1) includes compliance with § 22.190 since the requirement applies more to manufacturers and staff competencies than the aircraft itself. Like the prior response to EASA provided for § 22.185, FAA notes that the requirement of § 22.190 is written as a requirement on the aircraft. FAA affirms that compliance with § 22.100(a)(7) requires compliance with § 22.190 since the aircraft must have been found compliant with the provisions of the applicable FAA-accepted or approved consensus standards by individuals who have been trained on determining compliance with those consensus standards.

For this final rule, FAA made a correction to § 22.190 by adding "or approved" to account for voluntary part 36 noise requirements whose means of compliance could include FAA-approved consensus standards. For all other part 22, subpart B requirements, the means of compliance includes FAA-accepted consensus standards.

30. Ground and Flight Testing (§ 22.195)

The provisions of § 22.195 require an aircraft intended for certification as a light-sport category aircraft to have been ground and flight tested under documented production acceptance test procedures. This testing is required to verify aircraft performance data, ensure the aircraft has no hazardous operating characteristics, ensure the aircraft is in a condition for safe operation, and ensure the aircraft can safely conduct towing or any aerial work operation designated by the manufacturer. The manufacturer will ensure each aircraft can safely conduct towing or any aerial work operation by conducting flight testing of that operation. If successful, the manufacturer would be able to provide a statement of compliance to FAA-accepted consensus standards for this requirement.

Streamline Designs recommended changing § 22.195 from "The aircraft" to "Each aircraft produced" for the requirement that each aircraft must have been ground and flight tested. FAA agrees that "Each aircraft produced" has equivalent meaning, however, the rule will retain "The aircraft" to remain consistent with language used in several other part 22 requirements.

Streamline Designs also recommended changing proposed "validate" to "verify" in § 22.195(a) because, in part, validate means that a product meets the needs of the customer while verify means the evaluation of whether a product, service, or system complies with a regulation, requirement, specification, or imposed condition. FAA agrees that verify is more appropriate for § 22.195(a) and has changed proposed "validate" to "verify" in this final rule.

Streamline Designs and AIR VEV recommended changing § 22.195(b) to remove "or design features" so that it read, "Ensure the aircraft has no hazardous operating

characteristics." AIR VEV stated hazardous design feature testing should be conducted at the development phase rather than at this stage. FAA agrees and has removed "or design features" from § 22.195(b). The provisions in § 22.195 are for the production acceptance testing of light-sport category aircraft rather than for the flight testing of prototype and developmental aircraft. The flight testing of developmental aircraft occurs under the experimental purpose of research and development. This testing is for new aircraft design concepts, new aircraft equipment, new aircraft installations, new aircraft operating techniques, or new uses for aircraft. Production acceptance testing is for aircraft in a final configuration representing the light-sport category aircraft model for certification under § 21.190.

As explained in sections IV.F.14 and 16 for §§ 22.110 and 22.120, respectively, FAA will not include proposed § 22.120 in this rule. Accordingly, the final rule omits "in accordance with § 22.120" from § 22.195(d) so that it reads, "Ensure the aircraft can safely conduct towing and any aerial work operation designated by the manufacturer." Light-sport category aircraft manufacturers specify aerial work and towing operations that may be safely conducted by the aircraft in the aircraft's POH per § 21.190(c)(2)(iii) and (iv), respectively. In addition, for the manufacturer's statement of compliance per § 21.190(d)(3), manufacturers must specify towing and any aerial work operations the manufacturer has determined may be safely conducted, and state that the aircraft has been ground and flight tested to ensure that it can be operated to safely conduct those operations in accordance with the instructions and limitations provided by the manufacturer. Towing was not proposed in the NPRM for § 22.195(d) but has been included in this final rule in response to recommendations from commentors because towing puts similar loads on aircraft structures as certain aerial work operations. The

annex of ASTM Standard F2245 specifies additional requirements for light-sport category airplanes used to tow gliders. Compliance with these consensus standards is shown when the towed aircraft is safely controllable under tow at a speed for which its drag and weight are within the prescribed maximum weight and drag limits. A similar statement for towing gliders exists in the annex of ASTM Standard F2317/F2317M for light-sport category weight-shift-control aircraft. Accordingly, the addition of towing to § 22.195(d) reflects similar compliance action for flight testing already required of light-sport category aircraft manufacturers by FAA-accepted ASTM consensus standards.

USUA recommended the elimination of proposed § 22.120 and resultingly, § 22.195(d). Though FAA has removed proposed § 22.120 from the final rule, FAA disagrees with eliminating § 22.195(d). Ground and flight testing the aircraft ensures that towing and any aerial work operation designated by the manufacturer could be safely conducted. Flight testing would verify any limitation designated by the manufacturer as being necessary to safely conduct the specified operations.

31. Other Part 22 Comments

One commenter stated certification requirements for light-sport category aircraft with retractable landing gear, full authority digital engine control, adjustable propellers, and other items must be as demanding and comprehensive as for non-light-sport category airplanes with such features as these items are not more reliable or safe because they are in a light-sport category aircraft than in other aircraft where they have to be analyzed, tested, and certificated.

As previously discussed in section IV.C, the certification rigor of light-sport category aircraft may be less than the certification rigor of normal category aircraft since normal category aircraft have greater operating privileges, such as carrying passengers

and cargo for compensation or hire. In addition, light-sport category aircraft have restrictive operating limitations in § 91.327 that are not applicable to normal category aircraft.

This does not mean that complex systems will be unsafe on light-sport category aircraft. Part 22 has comprehensive requirements that will apply to the design, structural integrity, materials, operating environment, and functionality of aircraft systems such as retractable landing gear. In addition, part 22 has further requirements for quality assurance, finding of compliance to consensus standards by trained staff, and ground and flight testing.

In the specific case of landing gear, § 22.110 requires that the design and construction of the landing gear must provide sufficient structural integrity to enable safe operations within the aircraft's flight envelope throughout the aircraft's intended life cycle and must be able to withstand all likely flight and ground loads, including any aerial work operation, when operated within its operational limits. Section 22.125 requires the landing gear to have design characteristics to safely accommodate all environmental conditions likely to be encountered during its intended operations. Section 22.130 requires the suitability and durability of materials used for the landing gear to account for the likely environmental conditions expected in service, the failure of which could prevent continued safe flight and landing. Section 22.135 requires that the landing gear must perform its intended functions under all operating conditions specified in the pilot's operating handbook. Likely failure or malfunction of the landing gear must not cause loss of control of the aircraft. The landing gear must be considered separately and in relation to other systems and equipment. In addition, §§ 22.185 and 22.190 require that the landing gear must have been designed, produced, and tested under a documented

quality assurance system to ensure it conforms to its design and is in a condition for safe operation and that it must have been found compliant with the provisions of the applicable FAA-accepted or approved consensus standards by individuals who have been trained on determining compliance with those consensus standards. Finally, § 22.195 requires ground and flight testing of the landing gear to ensure it has no hazardous operating characteristics. Though these performance-based requirements are not as rigorous as those in part 23 for the landing gear of a normal category airplane, they are appropriate for the light-sport category and provide a proper foundation for the creation of consensus standards that would act as a means of compliance to the part 22 requirements.

Consensus standards will have to be developed by consensus standards organizations for the design, production, and airworthiness of retractable landing gear, adjustable pitch propellers, or any other complex systems that were not previously allowed for light-sport category designs.[60] FAA will evaluate any proposed consensus standards before deciding whether to accept them, to ensure that they are an acceptable means of compliance to regulatory requirements. The safety record of the light-sport category has demonstrated that manufacturers' compliance with FAA-accepted consensus standards can result in the production of safe aircraft.

AEA/ARSA disagreed with certain sections of part 22 and recommended that the regulatory requirements of parts 23 or 36 should be used for those systems. The associations stated they do not agree with the aircraft system descriptions as written. The associations supported the NPRM for performance-based safety standards; however, they suggested the safety standards should be aligned for aircraft of comparable size, speeds, and operations regardless of the airworthiness certificate the aircraft carries. The

associations suggested using the established safety standards as published by FAA for two seat airplanes in part 23, in the current amendment for level 1 aircraft, regardless of the airworthiness certificate issued.

FAA disagrees with AEA/ARSA's comments and suggestions for several reasons. To start with, FAA disagrees with the association's claim that light-sport category aircraft are intended to be two seat recreational aircraft. This statement is outdated as being aligned with the 2004 final rule but not with the NPRM and this final rule. As previously stated in the NPRM and in section IV.C of this rule, the performance expansions in this rule are based on the safety continuum, the successful use of light-sport category consensus standards to provide an accident rate commensurate with the normal category, and the implementation of design, production, and airworthiness requirements in part 22.

The associations stated general aviation safety standards should be consistent regardless of airworthiness certificate. To this comment, FAA points out that the associations failed to acknowledge that amateur-built aircraft are general aviation aircraft of comparable size, speeds, and operations as normal, primary, and light-sport category aircraft. Yet, amateur-built aircraft operate in the national airspace system (NAS) without any design requirements, though they do have to meet certain part 91 equipage requirements to access certain airspace. Omission of certificated amateur-built aircraft, which far outnumber certificated primary and light-sport category aircraft, weighs against the associations' claims since all three types are considered "general aviation" aircraft. In explaining the part 22 proposed requirements in the NPRM, FAA made several comparisons of type certificated, part 23 aircraft and EAB aircraft to explain where light-sport category aircraft fit on the safety continuum and why the proposed certification rigor for light-sport category aircraft was appropriate. By stating the light-sport category

should be held to the same airworthiness standards as the normal and primary categories, the associations are dismissing the application of the safety continuum. Instead, FAA asserts that each certification process serves a specific purpose and is bound by appropriate limitations and privileges.

FAA disagrees with AEA/ARSA's comment to replace §§ 22.135, 22.140, 22.145, 22.150, 22.155, 22.160, 22.165, and 22.170 with the regulatory requirements from parts 23. Though the commenters also included § 22.175, stating the requirement should be replaced with requirements from part 36, § 22.175 has been omitted from this final rule since compliance with part 36 for new light-sport category aircraft is voluntary. AEA/ARSA's suggestion does not align with the airworthiness certification rigor of the safety continuum as previously discussed in section IV.C. Sections IV.A.2 and IV.F.3 of the NPRM provided examples of the differences in certification rigor between the light-sport and normal categories and explained the reasoning that allows the certification rigor of the light-sport category to be less than that of the normal category.

Finally, FAA notes that certain existing FAA-accepted ASTM consensus standards for light-sport category airplanes[61] were recently used for the primary category airworthiness design criteria for type certification of the ICON Aircraft Model A5-8 airplane.[62] Contrary to AEA/ARSA's claim, FAA-accepted consensus standards for the light-sport category are sufficient for certain types of general aviation aircraft, as demonstrated by their use for the type-certification of a primary category aircraft. By using the light-sport criteria for a primary category airplane, FAA found that FAA-accepted consensus standards provided a level of safety acceptable to FAA.[63]

EASA questioned how the higher complexity of powered-lift and eVTOL would be addressed in the light-sport aircraft category from a manufacturing perspective. As

previously stated, consensus standards that will act as the means of compliance to the design, production, and airworthiness requirements in part 22 will have to be developed by consensus standards organizations for light-sport category powered-lift and rotorcraft. The consensus standards must be accepted by FAA before they can be used for the design, production, and special airworthiness certification of light-sport category aircraft.

ALPA commented that FAA is avoiding its regulatory responsibilities by using performance-based regulations that effectively empower the manufacturers to establish the regulations for safety. ALPA recommended that aircraft transporting persons or property should meet the certification standards and safety requirements afforded by part 43, 91, 135, 136, and 194 for airplane and rotorcraft as applicable. ALPA commented that FAA will have to rethink the traditional means of aircraft certification due to novel light-sport aircraft designs, new technologies, and varying capabilities. ALPA continued that complicated and distinctive operating equipment and characteristics of light-sport aircraft designs may require a combination of the aircraft certification standards from various parts.

FAA disagrees with ALPA's claim that the performance-based requirements of part 22 establish a new manufacturing concept. Performance-based requirements have been used for the airworthiness standards in part 23 for normal category airplanes since 2017. Also, FAA disagrees that consensus standards are a form of "certification" authorized by the manufacturer. Instead, consensus standards act as the means of compliance to FAA's regulatory requirements in part 22. FAA verifies that consensus standards meet the regulatory requirements before they are accepted by FAA. Only after earning FAA acceptance may a manufacturer use a consensus standard for the design, production, and airworthiness certification of light-sport category aircraft.

The recent accident rate of light-sport category aircraft, as shown in FAA's 2022 Light-Sport Category Aircraft Continued Operational Safety (COS) Report, demonstrates that safe light-sport category aircraft can be produced with the use of industry-developed and FAA-accepted consensus standards. OMB Circular A-119 directs Federal agencies to use voluntary consensus standards, both domestic and international, in their regulatory and procurement activities in lieu of government-unique standards, unless use of such standards would be inconsistent with applicable law or otherwise impractical. The use of consensus standards for light-sport category aircraft was previously discussed in section IV.C. However, it should be emphasized that FAA is an active participant in the development of consensus standards.

In addition, industry-developed consensus standards are an appropriate means to address the complex and distinctive operating equipment and characteristics of the new classes of aircraft being added to the light-sport category, such as powered lift and rotorcraft. Consensus standards organizations will have to develop consensus standards, appropriate for FAA acceptance, for novel propulsion and energy systems associated with light-sport category designs. The use of FAA-accepted consensus standards for other types of aircraft, such as unmanned aircraft or aircraft requiring higher levels of certification, may also be used as a method of compliance for the design and performance of novel or complex systems in light-sport category aircraft.

ALPA's comment about the certification standards of persons or property being transported on aircraft is misplaced. The safety continuum is used to scope appropriate limitations or restrictions that are based on an aircraft's level of certification rigor. Since light-sport category aircraft are at the lower end of the safety continuum, they have more restrictions and fewer privileges than normal category aircraft, as described in

section IV.C. These restrictions on light-sport category aircraft include the applicable operating limitations in § 91.327.

G. Miscellaneous Provisions for Issuance of Special Airworthiness Certificates

1. Removal of Marking Requirements for Light-Sport Category Aircraft (§ 45.23(b))

This rule eliminates the current requirement in § 45.23(b) to mark repainted or newly manufactured light-sport category aircraft with 'light-sport.' Light-sport category aircraft owners would not have to remove existing marks. Instead, aircraft owners would be allowed to remove the marks any time after the effective date of this provision.

EASA asked if FAA considered alternate means to depict to pilots and passengers the safety standard compared to normal category aircraft. This rule only effects the external "light-sport" markings. FAA has accepted ASTM consensus standards that include placarding requirements for pilot and passenger warnings. For instance, the passenger warning in ASTM Standard F2245 states, "This aircraft was manufactured in accordance with Light Sport Aircraft airworthiness standards and does not conform to standard category airworthiness requirements." A similar placarded warning exists in ASTM standards for other classes of aircraft that have type certificated equivalents such as gliders (ASTM Standard F2564) and lighter-than-air aircraft (ASTM Standard F2427, Standard Specification for Required Product Information to be Provided with Lighter-Than-Air Light Sport Aircraft). For lighter-than-air aircraft, the passenger notice reads, "This aircraft conforms to ASTM Consensus Standards of airworthiness developed and maintained by the aviation community under ASTM Technical Committee F37." These or similar consensus standards would meet the placarding requirements of § 22.170. Also, § 91.327 addresses EASA's concerns by requiring the pilot of light-sport category

aircraft to advise each person carried of the special nature of the aircraft and that the aircraft does not meet the airworthiness requirements for an aircraft issued a standard airworthiness certificate.

AEA/ARSA asserted that FAA failed to provide appropriate notice under the Administrative Procedure Act (APA) for the proposed change to § 45.23, contending that such change is not related to the topic area of "modernization of special airworthiness certification." FAA disagrees with the assertion that there was insufficient notice. As explained in the NPRM, the intended applicability to the marking proposal for § 45.23 was light-sport category aircraft. Since this rule includes aircraft that are issued special airworthiness certificates, light-sport category aircraft and the regulatory requirements of their airworthiness certification process clearly fall within the scope of this rule. The proper display of marks is part of the airworthiness certification process for every aircraft, meaning FAA would not issue an airworthiness certificate to an improperly marked light-sport category aircraft. Therefore, eliminating the requirement in § 45.23(b) to mark repainted or newly manufactured light-sport category aircraft with 'light-sport' is fitting to be addressed in this rule.

Furthermore, FAA complied with its obligation under 5 U.S.C. 553(b) to provide general notice in the *Federal Register* of the proposed rule in the NPRM. It is incumbent on the public to review and respond to that notice. For the reasons stated above, FAA disagrees that the public received inadequate notice of the proposed change to § 45.23.

2. Airworthiness Certificates: Classification (§ 21.175)

Section IV.N of the NPRM proposed to restructure § 21.175 to improve readability. There were no comments on this proposal. This final rule adopts the changes as proposed.

3. Duration of Airworthiness Certificates (§ 21.181)

For a special airworthiness certificate in the light-sport category to remain effective, the NPRM retained the current requirements for the aircraft to be registered in the U.S., not have an unsafe condition, and not likely develop an unsafe condition. The NPRM also retained the current requirement for the aircraft to conform to its original condition but used simpler language to capture the requirement for the aircraft to conform to its properly altered configuration. Because the NPRM proposed to remove the definition of light-sport aircraft from § 1.1, the provisions of the definition were included as proposed § 21.181(a)(3)(iv)(A) through (M) since they still apply to the certification of these aircraft.

For this final rule, several changes have been made to this section. A few changes were necessitated through the development and implementation of effective dates, as discussed in section IV.Q. For instance, for the first effective date of this final rule, [INSERT DATE 90 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER], the current § 21.181 airworthiness certificate duration requirements for light-sport category aircraft will remain valid with minor structural changes made to § 21.181(a), (a)(1), and (a)(4) for clarification and readability. Section 21.181(a)(4) was split into two separate sections, (a)(4) and (a)(5), to group experimental purposes with similar durations. These two sections are discussed in the experimental airworthiness certificate section IV.L.4. Section 21.181(a)(3)(iv) will be omitted because the aircraft registration requirement is included in § 21.181(a) as a general requirement for the duration of all standard and special airworthiness certificates.

On the second effective date, [INSERT DATE 365 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER], the proposed changes to

§ 21.181(a)(3) will be codified as described in the NPRM. However, FAA has determined that two corrections need to be made to the proposals in § 21.181(a)(3)(iv). First, this rule deleted proposed language in § 21.181(a)(3)(iv) that stated, "and for which an amended manufacturer's statement of compliance has not been submitted to FAA in accordance with § 21.190(e) on or after [INSERT DATE 365 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]." FAA determined that this clause adds no value for aircraft originally certificated under § 21.190 prior to [INSERT DATE 365 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER] because the provisions of § 21.181(a)(3)(iv) will still be necessary and valid regardless of whether an amended statement of compliance has been submitted to FAA. If this clause is not removed from this rule, there would be no provision for the duration of a light-sport category airworthiness certificate in § 21.181 for aircraft originally certificated prior to [INSERT DATE 365 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER] that did obtain an amended statement of compliance through § 21.190(e). Aircraft that obtain an amended statement of compliance will continue to be subject to the provisions of § 21.181(a)(3)(iv).

The second correction made in this final rule to § 21.181(a)(3)(iv) deletes proposed paragraph (I), which stated a requirement for a fixed-pitch, semi-rigid, teetering, two-blade rotor system, if a gyroplane. This provision should not have been included in this section of the NPRM since gyroplanes cannot be certificated as a light-sport category aircraft until on or after the second effective date of this final rule, or [INSERT DATE 365 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]. As a result of this correction, the proposed requirements in (J) through (M) are now listed in (I) through (L).

4. Aircraft Identification (§ 21.182)

No comments were received on proposed § 21.182. This final rule makes a conforming change to § 21.182(b)(2) by changing "experimental certificate" to "experimental airworthiness certificate" to remain consistent with the terminology of § 21.191 and the explanation in section IV.I.2 of the NPRM that experimental certificates are experimental airworthiness certificates. FAA did not receive any comment on this terminology change for § 21.191. This final rule amends this section to make such changes as are necessary to advance the intent of the rule.

5. Revision of Definitions Applicable to Light-Sport Category Aircraft

Definition of "Consensus Standard"

The NPRM proposed an amendment of the definition of "consensus standard" in § 1.1. In addition, FAA requested comment on whether it should remove the definition of consensus standard from § 1.1 altogether or revise the definition as proposed. FAA received 17 comments in response. For this final rule, FAA has chosen to remove the definition based on the comments received.

EASA, SAE International (SAE), GAMA, EAA, AOPA, NATA, NBAA, Van's Aircraft, and VAI recommended eliminating the definition of "consensus standard." EAA, AOPA, NATA and NBAA provided their comments jointly in a single response. Commenters argued that this term is commonly accepted, used, and understood. EASA commented that the term is applied to categories of aircraft that exceed the proposed definition. SAE, GAMA, Van's Aircraft, EAA, AOPA, NATA, NBAA, and VAI all expressed concerns about the limitations and potential negative impacts of maintaining a definition of "consensus standards."

Several commenters did not support the removal of the definition of "consensus standard." AEA/ARSA jointly commented that the proposed definition of consensus standards now applies to all aircraft design, operation, production, maintenance, or airworthiness applications. AEA/ARSA recommended FAA use the Office of Management and Budget (OMB) definition of consensus standards in OMB Circular No. A-119. FAA notes that OMB Circular A-119 applies to FAA regardless of whether part 1 defines "consensus standard;" FAA's understanding and use of the term, "consensus standard," is coextensive with OMB Circular A-119.

Airbus Commercial Aircraft and Airbus Helicopters (collectively, Airbus) expressed support for revising the definition of consensus standards. ANAC supported the proposed definition of "consensus standard," and recommended retaining this definition for clarity and consistency in interpretation and application. Streamline Designs also recommended retaining the definition but requiring an opportunity for "balanced input" as opposed to merely "input" by interested and affected persons. In deleting the definition of "consensus standard" from part 1, use of this and related terms will continue to be guided by OMB Circular A-119, which includes balance of interest in the definition of consensus standards body.

One commenter expressed concern that eliminating the definition would cause confusion and recommended revising the definition. Another commenter recommended choosing a new word or phrase instead of "consensus standard," asserting that the current terminology creates a "mental block." As neither of these two commenters provided specifics as to the change they would recommend, FAA is not implementing these recommendations. FAA does note that "consensus standard" is a globally used term and its use in the Federal government is prescribed by OMB Circular A-119, *Federal*

Participation in the Development and Use of Voluntary Consensus Standards and in Conformity Assessment Activities.

For this final rule, FAA will remove the definition of "consensus standard" from § 1.1. The term is already well known and widely used within the aviation industry and, therefore, there is no longer a need for a definition. Given its wide and diverse applicability, FAA agrees with the commenters who expressed concern with unintended negative consequences of adopting this revised definition; similarly, many commenters stated a single definition would fail to consider the nuances of particular applications. Commenters who expressed support for retaining the definition mentioned factors such as clarity, consistency, and avoiding confusion; however FAA considers that the risk of increased confusion is low. Use of this term is commonly and well understood within the aviation industry and its use within the Federal government is guided by OMB Circular A-119. Accordingly, this final rule eliminates the definition of consensus standard from § 1.1.

Of note, when a specific consensus standard, e.g., American Society for Testing and Material International (ASTM) Standard F2245, is referenced in this final rule, it means that FAA has previously accepted a version of that standard. Prior to the effective date of [INSERT EFFECTIVE DATE 365 DAYS AFTER PUBLISHED IN THE FEDERAL REGISTER], consensus standards developed by light-sport category consensus standards organizations were not acting as the means of compliance to regulatory design, airworthiness, or production requirements. The consensus standards FAA has previously found to be acceptable for manufacture of light-sport category aircraft are identified as FAA-accepted when the consensus standard is published in the *Federal Register* as a notice of availability (NOA) for public comment. Since consensus

standards may be created for international use, not all consensus standards published by light-sport category consensus standard organizations are for U.S.-certificated light-sport category aircraft or accepted by FAA. Consensus standards that have been FAA-accepted prior to the effective date of part 22 will still apply to light-sport category aircraft certificated prior to [INSERT EFFECTIVE DATE 365 DAYS AFTER PUBLISHED IN THE FEDERAL REGISTER]. On and after this date, FAA anticipates new consensus standards will be developed as the means of compliance to the design, airworthiness, or production requirements of part 22, including the performance expansions and new classes of aircraft allowed by this rule.

As required by § 21.190(c)(1) and (d)(5) in this rule, as a condition for eligibility for certification in the light-sport category, an aircraft must meet performance-based aircraft design, production, and airworthiness requirements using a means of compliance consisting of consensus standards accepted or approved by FAA. The rule provides the regulatory authority to deny airworthiness certification for a light-sport category aircraft if any applicable requirements in § 21.190(c) or part 22 have not been met.

H. Sport Pilot Certification and Privileges

Part 61 prescribes the requirements for issuing pilot and flight instructor certificates and ratings, the conditions under which those certificates and ratings are necessary, and the privileges and limitations of those certificates and ratings. Subpart J of part 61 prescribes the requirements for sport pilot certificates, while subpart K of part 61 prescribes the requirements for flight instructor certificates with a sport pilot rating. As discussed in the NPRM at length, a sport pilot certificate is not issued with category and class ratings (unlike the higher-grade pilot certificates), rather, pilots receive a logbook endorsement for the category and class for which the pilot is authorized to act as PIC.

Currently, a person receives a sport pilot certificate upon the successful completion of a practical test; to obtain privileges to operate an additional category or class, the sport pilot must receive training and an endorsement from an authorized instructor for the additional privilege, pass a proficiency check from an authorized instructor (other than the instructor who trained them), and receive a logbook endorsement from the instructor who conducted the proficiency check.[64] Relatedly, flight instructor certificates with a sport pilot rating (subpart K flight instructors) differ from a subpart H flight instructor certificate insofar as subpart K flight instructors may only provide training and endorsements for persons in pursuit of a sport pilot certificate and privileges.[65]

Sport pilot certificate privileges have been historically limited to only operating category and classes of light-sport aircraft as defined in § 1.1. As discussed herein, this final rule removes the definition of light-sport aircraft from § 1.1 and relocates the substantive requirements for a light-sport category aircraft to § 21.190. Therefore, FAA proposed amendments to prescribe performance and design limitations for aircraft that sport pilots can operate, modernizing subpart J Sport Pilot and subpart K Flight Instructors with Sport Pilot Rating regulations.

The following table summarizes key changes from the NPRM made in this final rule for part 61.

Table 4—Summary of Key Changes From NPRM in part 61

Proposed Action in the NPRM	Adopted by this Final Rule	Final 14 CFR §	Preamble Section
Removal of "light-sport aircraft" from 1.1, relocation of performance and design parameters since original certification into part 61.	Adopted as proposed.	§ 61.316	IV.H.1. IV.H.1.g.

Proposed Action in the NPRM	Adopted by this Final Rule	Final 14 CFR §	Preamble Section
Stall speed (VS1) increase from 45 knots CAS to 54 knots CAS for airplanes; retain 45 knots CAS for other aircraft.	Stall speed (VS1) increase to 59 knots CAS for airplanes, retain 45 knots CAS for other aircraft.	§ 61.316(a)(1)	IV.H.1.c.
Increase seating capacity for airplanes from 2 seats to 4 seats; retain 2 seats for other aircraft.	Adopted as proposed.	§ 61.316(a)(2)	IV.H.1.a.
Retain passenger limitation for sport pilots, add person-occupancy limitation for flight instructors with sport pilot ratings.	Adopted as proposed	§ 61.315(c)(4) § 61.415(k)	IV.H.1.a.
Relocate non-pressurized cabin if equipped with a cabin; for gyroplanes, a fixed-pitch, semi-rigid, teetering, two-blade rotor system and fixed or retractable landing gear; and for gliders, fixed or retractable landing gear.	Adopted as proposed.	§ 61.316(a)(3) § 61.316(a)(4) § 61.316(a)(7) § 61.316(a)(8)	IV.H.1.
Remove propeller design restrictions; require additional training to operate airplanes designed with controllable-pitch propellers that are not automated.	Adopted removal of restrictions and general training framework; revisions to clarify training applicability to airplanes with manual controllable pitch propellers, clarify use of any powerplant.	§ 61.315(c)(20)(ii) § 61.316(a)(9) § 61.316(b) § 61.331(b)	IV.H.1.k.
Remove fixed landing gear requirement; require additional training to operate aircraft with retractable landing gear	Adopted as proposed, clarifies applicability for aircraft intended for operation on water with retractable landing gear and adds training exception for persons who have previously logged PIC time in such aircraft.	§ 61.315(c)(20)(i) § 61.316(b) § 61.331(a) § 61.331(c)	IV.H.1.k.

Proposed Action in the NPRM	Adopted by this Final Rule	Final 14 CFR §	Preamble Section
Facilitate flight instructor certificate with a sport pilot rating privileges to provide training in an airplane with a manual controllable pitch propeller or an aircraft with retractable landing gear.	Adopted as proposed.	§ 61.415(l)	IV.H.1.k.
Restrict sport pilot from operating aircraft whereby a loss of partial power would adversely affect the directional control of the aircraft	Adopted as proposed, redesignated.	§ 61.316(a)(5)	IV.H.1.b.
No proposal pertaining to subpart J and K compensation.	Retain restriction on sport pilot privileges for compensation or hire; explicitly permits flight instructors with a sport pilot rating to receive compensation when providing flight training.	§ 61.413(d)	IV.H.1.f.
Permit night operations with training, endorsement, and experience requirements.	Adopts general framework with reorganization and revisions to minimum flight experience requirements and specific to the category and class of aircraft.	§ 61.315(c)(5) § 61.329(a) § 61.329(c)	IV.H.1.j. & IV.H.1.j.i.
Require at least a Third-Class medical certificate or meet the requirements of BasicMed to operate at night.	Adopted as proposed, corrects incorrect reference.	§ 61.329(b)	IV.H.1.j.iii.
No proposal pertaining to § 61.23.	Deconflicts provisions of § 61.23 with the night operation medical requirements in § 61.329.	§ 61.23(c)(1)(vi)	IV.H.1.j.iii.
Facilitate flight instructor certificate with a sport pilot	Adopted as proposed.	§ 61.415(n)	IV.H.1.j.ii.

Proposed Action in the NPRM	Adopted by this Final Rule	Final 14 CFR §	Preamble Section
rating privileges to provide night flight training.			
Require pilots seeking to act as PIC of aircraft certificated with a simplified flight controls designation to obtain model-specific training and an endorsement in that aircraft.	Adopted as proposed.	§ 61.31(l)	IV.H.2.
Limit a sport pilot instructor from providing training in an aircraft with simplified flight controls designation unless the sport pilot has received the model-specific training and endorsement	Adopted as proposed.	§ 61.415(m) § 61.429(d)	IV.H.2.
Facilitate subpart H instructors employed by the manufacturer of aircraft with the simplified flight controls designation to provide training and endorsements.	Adopted as proposed, redesignated from paragraph (m) to (n).	§ 61.195(n)	IV.H.2.
No proposal pertaining to subpart H flight instructor prerequisites for simplified flight controls.	Requires subpart H flight instructors to take their initial flight instructor practical test in an aircraft with conventional controls as a prerequisite to instruct in an aircraft with simplified flight controls.	§ 61.195(m)	IV.H.3.
Limit certain pilot time in an airplane or helicopter with a simplified flight controls designation from satisfying certain flight time requirements for a higher-grade certificate.	Adopted as proposed.	§ 61.9	IV.H.2.
Require examiners who agree to conduct practical tests for an initial pilot	Adopted as proposed.	§ 61.45(g)(1) – (3)	IV.H.3.

Proposed Action in the NPRM	Adopted by this Final Rule	Final 14 CFR §	Preamble Section
certificate, rating, or privilege in an aircraft with a simplified flight controls designation; hold the appropriate category and class rating or privilege; and have the ability to assume control of the aircraft.			
Limit a pilot who receives a category and class rating or privilege with a simplified flight controls limitation to operation of only that make and model of aircraft.	Adopted as proposed, expands on paragraph (g)(4) to address aircraft that are not capable of performing all the required tasks in the ACS.	§ 61.45(g)(4) § 61.45(h)	IV.H.3.
Require a pilot with a simplified flight controls limitation seeking to operate another make and model of aircraft with a simplified flight controls designation in the same category and class to receive training and an endorsement.	Adopted as proposed.	§ 61.45(h)(1)	IV.H.3.
Require a pilot with a simplified flight controls limitation seeking to operate a different category as an initial applicant for that category and class rating and class of aircraft with a simplified flight controls designation and an aircraft without a simplified flight controls designation to successfully complete a practical test for that category and class of aircraft.	Adopted with clarification of initial applicant applicability.	§ 61.45(h)(2)	IV.H.3.
Permit sport pilots to operate helicopters certificated under proposed § 21.190 that include the	Adopted as proposed, redesignated.	§ 61.316(a)(6)	IV.H.4.

Proposed Action in the NPRM	Adopted by this Final Rule	Final 14 CFR §	Preamble Section
simplified flight control designation			
Add helicopter to flight proficiency requirements and aeronautical experience areas of operation.	Adopted as proposed.	§ 61.311 § 61.409	IV.H.4.
Require minimum flight training and time for applicants seeking to obtain a helicopter privilege.	Revises certain elements of minimum flight training requirements and time.	§ 61.313(a)(9)	IV.H.4.
Require minimum flight experience requirements for applicants seeking to obtain a flight instructor certificate with a sport pilot rating, helicopter privilege.	Adopted as proposed.	§ 61.411(h)	IV.H.4.
Incorporate by reference Sport Pilot for Helicopter—Simplified Flight Controls ACS and Sport Flight Instructor for Helicopter—Simplified Flight Controls ACS.	Adopts and relocates incorporated by reference ACSs.	§ 61.14(b)(13) § 61.41(b)(17) Appendix A	IV.H.5.
Require sport pilots and flight instructors with a sport pilot rating seeking to add an airplane or helicopter privilege to their existing sport pilot certificate or flight instructor certificate to accomplish a knowledge test and practical test	Adopts practical test requirement, removes knowledge test requirement, reorganization of § 61.321.	§ 61.321(b) § 61.419(e)	IV.H.6.
Permit sport pilots to use up to 2.5 hours of training credit in an FSTD and ATD representing the appropriate category and class of aircraft.	Adopted as proposed.	§ 61.313(b)	IV.H.7.
Conforming amendments to remove references to light-sport aircraft, corrected formatting.	Adopted as proposed, added additional light-sport aircraft reference revisions.	See preamble section.	IV.H.9.

Proposed Action in the NPRM	Adopted by this Final Rule	Final 14 CFR §	Preamble Section
Conforming amendment to require a sport pilot exercising the privileges listed in § 61.313 must receive a qualifying logbook endorsement for the appropriate category and class privilege.	Adopted as proposed.	§ 61.3(m)	IV.H.9.
Proposed to amend wording to replace light sport and proposed to change title of section. No proposal to amend wording in regulatory text.	Adopted as proposed, and amended regulatory text to eliminate redundant uses of "pilot certificate" in same sentence	§ 61.45(f) and § 61.45(f)(3)	IV.H.3.
No proposal to amend wording in regulatory text for limitation	Added this provision simply clarifies an existing limitation rather than making a change to an existing privilege or limitation.	§ 61.315(c)(21)	IV.H.1 & IV.H.8.g

The following sections discuss the provisions being adopted in this final rule.

1. Sport Pilot Operational Privileges, Performance Limits and Design Requirements (§§ 61.315 and 61.316)

Currently, § 61.315 sets forth the privileges and limitations of a sport pilot certificate. The NPRM proposed to largely retain the privileges and limitations as currently prescribed but proposed two notable expansions to, first, facilitate night operations upon certain training and an endorsement and, second, permit operations in aircraft with retractable landing gear and controllable pitch propellers. These proposals are further discussed in sections IV.H.1.j and IV.H.1.k of this preamble, respectively. Aside from these two privilege expansions, this final rule does not make any additional changes to sport pilot certificate privileges and limitations in § 61.315.[66]

The proposal to remove the § 1.1 light-sport aircraft definition would separate aircraft certification requirements from sport pilot aircraft design and performance limitations. As a result, FAA proposed new § 61.316 to prescribe performance and design limitations for the aircraft sport pilots can operate, which this final rule adopts. New § 61.316 will specify the expanded performance and design limitations for aircraft that sport pilots are permitted to operate, which includes the sport pilot aircraft performance characteristics that were originally provided in the § 1.1 definition of light-sport aircraft and a number of limitations currently set forth in the definition. Specifically, FAA proposed several revised requirements in § 61.316, to include: stall speed, maximum seating capacity, propeller systems, directional control and controlled descent, simplified flight controls for helicopters, and landing gear, adoption of which is described in this section of the preamble. The unchanged requirements from § 1.1 that will reside in § 61.316(a) are: non-pressurized cabin, if equipped with a cabin (§ 61.316(a)(3)); for gyroplanes, a fixed-pitch, semi-rigid, teetering, two-blade rotor system (§ 61.316(a)(4)); and for gliders, fixed or retractable landing gear (§ 61.316(a)(7)).[67]

The final rule expands the variety of aircraft that can be certificated under part 21, which is discussed in section IV.H.1.g of this preamble, and aircraft that a sport pilot may operate under part 61. While the light-sport category aircraft certification requirements set forth in § 21.190 may differ from the sport pilot aircraft limitations in § 61.316, the aircraft design and performance limitations set forth in § 61.316 are specific to any aircraft that a sport pilot may operate. Thus, a sport pilot may operate an aircraft that meets the design and performance limitations set forth in § 61.316 but may not be certificated or be eligible for certification in the light sport category under part 21. The converse could also be true; an aircraft could be certificated under part 21 in the light

sport aircraft category, but a sport pilot would not be able to operate it unless it met the design and performance characteristics in part 61. In sum, the aircraft certification requirements and pilot certification requirements are two different safety considerations.

The expansion of eligible aircraft will provide manufacturers a more affordable and effective method to certificate aircraft that meet an industry standard (ASTM consensus standards), producing aircraft that sport pilots can use for training or recreational flight operations.[68] The final rule also expands the aircraft sport pilots can operate under the new § 61.316, permitting sport pilots to operate aircraft with more robust and reliable airframes than are possible under the current light-sport aircraft definition limitations. Moreover, the final rule will provide pilots with a safer and more affordable aircraft alternative, compared to operating aircraft with an experimental designation that do not meet any aircraft certification standards.

As previously stated, new § 61.316 identifies and expands the design and performance limitations for aircraft that sport pilots and flight instructors with a sport pilot rating can operate. This includes those aircraft that will be available to sport pilots and flight instructors with a sport pilot rating (subpart K) who, prior to this rulemaking, successfully completed a practical test for an initial sport pilot or flight instructor certificate, as well as those pilots who successfully completed a proficiency check to operate an additional category or class of aircraft.[69] As discussed herein, this final rule will most significantly expand the selection of airplanes that a sport pilot may operate by revisions to the maximum stall speed and seating capacity. For example, previously, a sport pilot could operate a Cessna 162 but not a Cessna 172 because the latter exceeded the light-sport aircraft weight limitation in current § 1.1. Under this new rule, a sport pilot could now operate either a Cessna 162 or a Cessna 172 using their sport pilot privileges.

FAA analyzed the risk associated with currently certificated sport pilots operating more complex aircraft under new § 61.316 and determined that no additional training will be necessary for these pilots to safely operate additional aircraft meeting the parameters of § 61.316. In addition, under this final rule and as discussed throughout this section of the preamble, these currently certificated pilots will be required to obtain the appropriate training and endorsement for operating characteristics that FAA has determined necessitate additional training due to the operational risk (e.g., night operations, airplanes with manual propellers).[70] FAA emphasizes the existing requirements of § 61.31 continue to apply; for example, sport pilots will need to receive additional training and an instructor endorsement prior to operating airplanes that are high-performance or complex (or both).[71] Because of the similar operating profile and additional training requirements to mitigate risks associated with these expanded operational privileges, FAA finds these currently certificated sport pilots and sport flight instructors can immediately take advantage of operating more robust, reliable, stable airplanes, and can otherwise be safely permitted to operate airplanes under the new § 61.316 limitations.

To note, as proposed, this final rule will require a person seeking to add an airplane single-engine land or sea or a rotorcraft-helicopter privilege to successfully accomplish a practical test for that category and class privilege as specified in § 61.307(b), regardless of whether they already hold a sport pilot certificate or whether they are seeking an initial privilege. Given the increase in privileges associated with operating an airplane in the NAS and the new operational privilege for helicopters with simplified flight controls, FAA recognizes that, going forward, it is necessary to require a practical test to validate skill and proficiency to operate an airplane in the NAS. In other words, airplane and helicopter performance with the aircraft under this final rule will vary

in such an extensive way such that a proficiency check is insufficient to validate pilot competency when adding a single-engine airplane privilege and helicopter with simplified flight controls privilege safely in the NAS. Practical tests conducted by authorized evaluators promote safety by making tests more meaningful and relevant to actual flight operations and contribute to standardization in testing these concepts; this provision is discussed at length in section IV.H.6 of this preamble.

The following sections summarize proposed changes to § 61.315 and new § 61.316, adjudicate relevant public comments, and discuss changes adopted in this final rule as an outgrowth of comments. FAA generally received broad support for the expansion of the light-sport category and sport pilot privileges but responds to opposing comments herein. FAA received many unrelated comments that either did not support or oppose the proposed rulemaking, or did not provide substantive suggestions or recommendations for FAA to consider. As such, FAA is unable to respond to these comments.

a. Sport Pilot Seating Limitation

Currently, sport pilots are limited by definition in § 1.1 to operating light-sport aircraft with a maximum seating capacity of no more than two persons, including the pilot. The NPRM proposed to retain the seating capacity limit to two persons under new § 61.316 for all aircraft except airplanes, which would allow a maximum seating capacity of up to four persons, including the pilot. One significant objective of this rulemaking is to facilitate and promote the use of more robust and reliable airframes, both in the context of aircraft certification and for those aircraft that can be operated by sport pilots. This rulemaking will permit sport pilots to operate a variety of additional certificated airplanes, including the use of single-engine, four-seat airplanes that meet the revised

design and performance limitations listed in the new § 61.316. As discussed in the NPRM,[72] FAA maintains that the sport pilot skills necessary to safely operate a four-seat airplane do not materially differ from those skills required to operate a two-seat airplane if the airplane satisfies the sport pilot aircraft design and performance limitations listed in new § 61.316. Therefore, this final rule adopts new § 61.316(a)(2), which will set forth, first, the current two-seat limitation for all aircraft except airplanes and second, the increase in maximum seating capacity for airplanes that a sport pilot can operate from two to four seats.

Considering the expansion of airplanes that have a maximum seating capacity of four persons under new § 61.316, FAA stated in the NPRM that sport pilots would continue to be limited in § 61.315(c)(4) to carrying only one passenger. Similarly, FAA proposed in § 61.415(k) to limit flight instructors with a sport pilot rating to carriage of one person. After this NPRM published, FAA published Public Aircraft Logging of Flight Time, Training in Certain Aircraft Holding Special Airworthiness Certificates, and Flight Instructor Privileges final rule on October 2, 2024,[73] which amended § 61.1(b) to define "passenger" as any person on board an aircraft other than a crewmember, FAA personnel, manufacturer personnel required for type certification, or a person receiving or providing flight training, checking, or testing as authorized by part 61. Considering this new definition, FAA maintains that sport pilots would be restricted to carriage of one passenger, and flight instructors with a sport pilot rating to carriage of one person. Because FAA defined "passenger" to exclude a flight instructor and trainee, flight instructors will be limited by "person" to restrict a scenario where a flight instructor with a sport pilot rating could carry the trainee and a second person (who would be considered the passenger). Sport pilot training operations should not include a second person (e.g.,

an observer or third party receiving a ride) due to the inherent risk via trainees learning aircraft fundamentals and manipulating the controls. If a pilot seeks to carry additional persons, the pilot will need to obtain at least a private pilot certificate.

FAA received approximately 228 comments in response to these proposed changes.

i. Increased Seating Capacity

Many commenters generally supported the proposal for sport pilots to operate certain airplanes designed with up to four seats. Commenters emphasized benefits such as: the resulting expansion of aircraft that can be flown by sport pilots; the resulting appeal of these aircraft to other pilots for recreation, training, and personal transportation; and the availability of safer, more viable, and more versatile aircraft to sport pilots (including the inclusion of legacy aircraft).

While most commenters supported increasing the seating capacity for airplanes sport pilots would be permitted to operate, a few commenters, including Air Line Pilots Association, International (ALPA), opposed increasing seating capacity, suggesting that (1) sport pilots may not have sufficient training, (2) the increased seating capacity would tempt sport pilots to violate the single passenger limitation,[74] and (3) the expansion will allow heavier airplanes, which will reduce the safety benefits of aircraft sport pilots are permitted to operate. ALPA further explained that instead of pilots abandoning the use of homebuilt aircraft, it is more likely that a significant group of pilots will migrate from using normal category aircraft to lower-cost, light-sport category aircraft, which are lower on the FAA safety continuum.

Permitting sport pilots to operate airplanes with up to four seats is consistent with FAA's safety continuum risk assessment. Sport pilots will continue to be limited to

carrying only one passenger, and the increased seating capacity will not substantially increase the weight of the airplane such that sport pilots will be unable to operate the airplane safely with four seats, as compared to two. Because the performance and handling characteristics of the airplane would not substantially change from two to four seats, FAA maintains that the skill needed to operate either airplane is generally similar, such as proficiencies for normal takeoffs and landings or avoiding stalls. Though some pilots may migrate from normal category aircraft to lower-cost, light-sport category aircraft, FAA anticipates, and many commenters agree, that the rulemaking will instead allow existing production aircraft that are readily available and meet an aircraft certification standard to be operated with sport pilot privileges. Since many normal category aircraft are readily available to pilots and eligible for sport pilot operations under this rule, FAA anticipates the greater capabilities of these normal category aircraft will continue to attract pilots, even when compared to lower-cost but less capable light-sport category aircraft. FAA notes this was one intent of the rulemaking project: expanding eligibility for aircraft certification, airmen certifications, and related operating privileges of light-sport category aircraft. This rulemaking will provide access to safer aircraft, such as aircraft holding standard airworthiness certificates, as an alternative for sport pilots via the performance and design limitations in new § 61.316 compared to the use of aircraft with an experimental airworthiness certificate that do not meet any standard for aircraft certification.

Finally, while FAA appreciates ALPA's concern that expanding the available seats in an aircraft may tempt a pilot to carry more than one passenger, pilots are required to comply with regulations. Any operation intentionally contrary to the requirements will result in enforcement action. This rulemaking will retain the one-passenger limitation as a

regulatory limitation and legal deterrent from such a temptation. Should a pilot violate the regulation, the pilot would be subject to an enforcement action, which may include a certificate action, informal procedures, or both.[75]

ii. Increase Passenger Occupancy

FAA received many comments opposing the retention of the one-passenger occupancy limitation and recommending FAA permit sport pilots to carry more than one passenger in an airplane. Several commenters, including ALPA, supported retaining the one-passenger limit for sport pilots operating an airplane with up to four seats. Some commenters emphasized safety concerns such as loss of life associated with allowing sport pilots to carry more than one passenger. A few commenters urged FAA to continue to require a pilot to have a higher-grade certificate, such as a private pilot, or have higher medical standards, such as a third-class medical or meet the BasicMed standards, to carry more than one passenger.

Other commenters, including EAA, AOPA, NATA, and the NBAA's joint comment, stated as the number of seats increase in aircraft sport pilots can fly, the number of passengers allowed should also increase. Many commenters, including Doroni Aerospace and 3F Consortium, recommended facilitating an additional passenger allowance by requiring additional training, instructor endorsements, or both. Conversely, some commenters stated allowing additional passengers would not require any additional pilot skills or comprise safety concerns consistent with FAA's analysis of the light sport category aircraft safety record. Several commenters drew comparisons to the operation of motor vehicles, which do not have a limit on the number of passengers. Other commenters referenced similar accident fatality rates for existing sport pilots compared to private pilots. These commenters emphasized a lack of data supporting the position that

more than one passenger increases accident risk and rate in support of additional passengers, thereby increasing the sport pilot certificate utility (including through cost sharing) and enhancing the aviation experience. Several commenters suggested increasing passenger allowance for recreational flying or instructional flying, or limiting additional passengers to friends and family, flight training, and flight school rental.

Some commenters recommended increasing the passenger limitation with contingencies or additional requirements, such as aircraft safety equipment; weight and balance limitations; third-class airman medical certificate or BasicMed medical qualifications; minimum experience requirements to carry additional passengers, such as model-specific experience or minimum hours of flight time or PIC time; possession of a sport pilot certificate for at least six months; training and an endorsement from an authorized instructor in the specific make and model used; or some combination of these requirements.

While FAA understands the commenters' suggestions, FAA does not intend to allow operations carrying additional passengers with the increase in number of available seats with this rulemaking. The increase in allowable seats in airplanes is intended to expand the reliable and stable airplanes that may safely be operated using sport pilot privileges, thereby providing more options available to sport pilots. To be clear, this change is about improving safety by making more reliable and stable aircraft available to sport pilot certificate holders. However, FAA did not propose changes to the airman requirements to justify changing the number of passengers permitted. Sport pilot certificates have a lower aeronautical experience requirement and allow an airman to exercise sport pilot privileges without holding an FAA medical certificate issued under part 67 or BasicMed under part 68. Based on these requirements, FAA previously

determined the risk profile supports sport pilots carrying only one passenger.[76] In the absence of changes to those requirements, FAA does not support expanding sport pilot privileges to include additional passengers.

Further, FAA does not find the basis that a driver's license does not have a passenger limitation to be a synonymous situation justifying a passenger privilege expansion herein. Operating an aircraft is a significantly unique and demanding operation compared to operating a motor vehicle that is reflected by the numerous experience, training, testing, and regulatory pilot certification requirements.

iii. Applicability of Airplane Four-Seat Expansion to Other Classes of Aircraft

Many commenters, including Safari Helicopter, SilverLight Aviation, LLC (SilverLight), Skyryse, AIR VEV, Vertical Aviation Technologies, Inc., and Orlando Helicopter Airways, Inc. recommended providing the same four-seat allowance for the new sport pilot privilege to operate helicopters with simplified flight controls or helicopters with conventional controls.[77] Commenters asserted that there are few, if any, differences between two-seat helicopters, which sport pilots will be permitted to operate under this rulemaking, and four seat helicopters. SilverLight suggested that if stall speed is the measure of safety to permit four seats for airplanes, then FAA should consider the same allowance for trikes, gyroplanes, and helicopters, stating no technical reason why a four-seat airplane with a stall speed of 54 knots is safer than a gyroplane with a stall speed of 20 knots or lower. AIR VEV recommended the seat limitation for other classes of aircraft be prescribed in FAA-accepted consensus standards, which could initially limit rotorcraft and powered-lift to two seats and then be later modified once the industry and FAA has gained sufficient safety data regarding these types of aircraft. Another commenter recommended specifically increasing weight shift control aircraft seating

capacity to three persons, but did not provide reasoning as to why three seats in weight shift control aircraft maintained safety.

FAA disagrees with permitting sport pilots to operate four-seat helicopters or any other category and class of aircraft with four seats, except for airplanes. The airplane maximum V_{s1} stalling speed is not the only consideration for the seating capacity of an aircraft that a sport pilot is permitted to operate. As explained in the NPRM, because of weight and balance challenges due to unusual or expanded seating configurations and limited experience and safety data available, including when operating helicopters with simplified flight controls, FAA did not find it appropriate to propose additional seating capacity for the other aircraft category and classes and maintains this position. Because this final rule facilitates a new class of aircraft that sport pilots can operate, FAA does not have sufficient data available at this time to support a commensurate seating expansion for sport pilots to operate four-seat helicopters. Should helicopter manufacturers develop and certify future simplified flight controls designs for four-seat helicopters that satisfy § 61.316 design and performance limitations, they may be further assessed and considered in future rulemaking proposals. In other words, this rulemaking does not categorically foreclose the possibility of expanding seating capacity in the future; rather, FAA is taking a measured approach to expansion before implementing the same changes to a new class of aircraft that sport pilots may fly (i.e., helicopters with simplified flight controls).

In addition, FAA did not consider increasing the seating capacity for the other category and classes of aircraft in the NPRM. FAA proposed to allow sport pilots to operate four-seat airplanes because FAA determined that the skill necessary to operate two-seat airplanes, compared to four seat airplanes, does not appreciably differ due to the

similarity in design, weight, and operational capabilities, whereas the required skills increase due to substantive differences in design, weight, and operational capabilities of other aircraft categories and classes, such as gliders and powered parachutes. That determination did not extend to the other categories or classes of aircraft, and expansion of seating capacity in those other categories and classes of aircraft is outside the scope of this final rule. Further, expansion of seating capacity (other than airplanes) would conflict with FAA safety continuum concept. FAA asserts that if an individual wishes to operate aircraft other than airplanes with a greater number of seats, they will need to obtain a higher grade of pilot certificate.

Further, FAA does not find consensus standards to be the appropriate avenue to set forth the performance limits and design requirements for aircraft that a sport pilot may operate. As discussed in the NPRM, currently § 1.1 provides a definition for "consensus standard;" however, this final rule removes the definition of a consensus standard.[78] Consensus standards have traditionally been used, for example, for the airworthiness certification of light-sport category aircraft to comply with certain performance based standards for the certification of airplanes and as a means of compliance for the operation of unmanned aircraft systems (UAS) over people under part 107. Conversely, consensus standards are not utilized for pilot certification because they contain large amounts of inapplicable and extraneous information for the pilot certification process. Rather, § 61.316 will set forth the minimum performance limits and design requirements commensurate to the sport pilot training, which will include the maximum seating capacity for an aircraft a sport pilot can operate.

iv. Pilots with a Higher Grade of Certificate

Some commenters recommended FAA allow pilots with a higher grade of pilot certificate, such as private pilot or higher, to carry up to three passengers when exercising sport pilot privileges. These commenters reasoned that because these pilots hold a higher-grade certificate and are only exercising sport pilot privileges, these pilots have the experience necessary to carry more passengers safely.

Pilots who possess a higher grade of pilot certificate but are exercising the privileges of a sport pilot certificate do so because they have decided to exercise only the privileges associated with that lower grade of pilot certificate. Often, the pilot cannot meet medical or other minimum airman qualification requirements associated with the higher grade of pilot certificate they currently possess, thereby increasing risk to the general public and the NAS if they were permitted to carry additional passengers. Therefore, FAA does not find a compelling reason to broadly permit persons choosing to exercise the privileges of a sport pilot certificate to carry more than one passenger solely on the basis of holding a higher-grade certificate.

v. Seating Configuration

Several commenters stated FAA should consider aircraft with four seats as qualifying at the time of the flight rather than the number of seats since its original certification, which would further increase the number of aircraft that a sport pilot could operate. These commenters specifically refer to the proposal in § 61.316(a), which tethers the performance limits and design requirements for aircraft a sport pilot may operate to those aircraft possessing the provided characteristics since its original certificate.

First, FAA notes the expansion of the stall speed addresses commenters' primary concern to increase the number of aircraft sport pilots may operate. In addition, FAA maintains the limitation of "since its original certification" in § 61.316(a) as necessary to

ensure airplane seating capacity is determined at the time of certification rather than at the time of flight (e.g., removing seats from aircraft with more than four seats to fit the four-seat restriction that will be adopted within § 61.316)). Airplanes with more than four seats are traditionally heavier and characterized by more complex operating characteristics. Removing seats merely changes the number of persons that may be seated in the airplane but does not substantially impact the performance characteristics associated with heavier, more complex airplanes. Rather, the change could actually complicate handling characteristics of the airplane (e.g., weight and balance considerations). For example, if FAA were to remove the original certification requirement, airplane owners could remove seats from larger airplanes, such as a Piper PA-32 or Cessna C-206, that is not intended for sport pilot use. These airplanes were originally certificated with a seating capacity of more than four seats; however simply removing seats would not change the original design and performance of those aircraft, of which are not encapsulated by the sport pilots training and testing regime.

FAA maintains that if an individual wishes to carry more passengers, they may obtain a higher grade than a recreational pilot certificate that addresses that increased risk by accomplishing the appropriate training, qualifications, and testing for the privilege to carry additional passengers, such as a private pilot certificate. Section IV.H.g of this preamble further discusses additional comments regarding original certification.

b. Directional Control and Controlled Descent of Powered Aircraft Stall Speed

Currently, the light-sport aircraft definition set forth in § 1.1 does not expressly require an aircraft to have the capability to maintain directional control and a controlled descent in the event of a powerplant failure. As discussed in the NPRM,[79] there was no safety of flight issue in this omission because the requirement was inherent in airplane

manufacture design and the light-sport aircraft definition excluded helicopters and powered-lift, which are aircraft that are not inherently characterized to have the ability to maintain directional control and a controlled descent in the event of a powerplant failure. Proposed § 61.316(a)(7) included a requirement that sport pilots may only operate aircraft in which the directional control of the aircraft would not be adversely affected by the loss of partial power, and the aircraft design must allow the pilot the capability of establishing a controlled descent in the event of a partial or total powerplant failure (excluding airships and balloons). While FAA received several comments on this provision, FAA continues to find that the requirement for aircraft to have the capability to maintain directional control and controlled descent in the event of a partial or complete powerplant failure is necessary to mitigate unacceptable risk to other aircraft operations in the NAS, persons in those aircraft, and persons or property on the ground, as subsequently discussed. Therefore, this final rule adopts the content in proposed § 61.316(a)(7) as § 61.316(a)(5) due to renumbering in that section.

FAA received seven comments specific to the proposed loss of power and controlled descent requirement as proposed. While some commenters, including ALPA, supported the proposal, other commenters opposed the new controlled descent requirement. AIR VEV expressed concern that the proposed requirements could be interpreted in several ways because the term "controlled descent" is not defined. AIR VEV suggested adding modifiers such as "safe" or "slow" before "controlled descent." AIR VEV explained they believe FAA's interpretation of controlled descents after a power loss involves gliding, helicopter auto-rotation, or using a ballistic parachute, which they state are safer than the proposed language of maintaining directional control and a controlled descent. AIR VEV also suggested proposed § 61.316(a)(7) (adopted herein as

paragraph (a)(5)) be revised to require the aircraft design to enable the pilot the capability to establish a controlled safe descent in the event of a partial or total powerplant failure.

FAA does not find it necessary or appropriate to define the term "controlled descent." "Controlled descent" is a foundational principle of flight. In aviation, the term is commonly understood to mean the process of safely and deliberately reducing altitude. Defining the term could have unintended consequences that place restrictions on how pilots safely land their aircraft. Weather, terrain, aircraft characteristics, and other factors may all influence how a pilot conducts a controlled descent, making a single definition impractical. Accordingly, FAA determined that the pilot is in the best position to determine how to safely and deliberately reduce altitude without being constrained by a definition. AIR VEV's reference to scenarios like gliding, auto-rotating, or using a ballistic parachute would constitute operational regimes that will meet the requirement for a powered aircraft to be capable of a controlled descent in the event of a partial or total power failure under new § 61.316(a)(5).

USUA recommended the directional control and controlled descent requirements be revised to only apply to helicopters and powered-lift because the previous light sport aircraft definition in § 1.1 did not require a light-sport aircraft to have the capability to maintain directional control and controlled descent in the event of a powerplant failure. USUA stated expanding the requirements to all categories of aircraft would be a detriment to safety and dilute resources that could be used for relevant design and testing issues.

First, FAA did not extend powered-lift privileges to sport pilots in this rulemaking because of the complexity of those operations and the ongoing development of that new technology. If powered-lift are certificated under parts 21 or 23, individuals can seek a

powered-lift category rating at the private pilot certificate level; therefore, FAA finds it unnecessary to add an explicit application to powered-lift in § 61.316(a)(5), as USUA suggests, at this time. Further, this final rule does not revise § 61.316(a)(5) to exclusively apply to helicopters because the increased risk associated with partial or complete powerplant failure is applicable to all categories of aircraft under the expanded parameters of aircraft that sport pilots may operate. In the NPRM, FAA stated the omission of the explicit requirement for directional control and a controlled descent in the event of powerplant failure did not present a safety concern since it was inherent in airplane manufacture and design under the light-sport category aircraft definition. However, given the expanded performance limits and design requirements for aircraft that a sport pilot may operate and the other types of powered aircraft adopted in this final rule that may not have these inherent safeguards in place like airplanes, FAA finds it necessary to explicitly require these characteristics for all aircraft for sport pilots to operate (excluding ballons or airships). FAA did not receive any data or supporting evidence to indicate consideration of these capabilities will dilute resources for aircraft manufacturers or testing activities, especially where most aircraft sport pilots operate are airplanes (where, as previously stated, these characteristics are inherently present).

GAMA recommended FAA clarify if the intent of the rule proposal is for single, partial, or all powerplants regarding complete or partial loss. New § 61.316(a)(5) utilizes the term "partial" when describing the threshold of loss of power; "partial" loss means any degree of powerplant failure that would result in incomplete power, which could occur in only one powerplant, limiting an aircraft's ability to maintain altitude and be forced into a descent configuration.

c. Stall Speed Limit

The current § 1.1 light-sport aircraft definition limits the maximum V_{S1} stall speed for light-sport fixed-wing aircraft to 45 knots CAS at the aircraft's MTOW and most critical center of gravity. FAA's proposal retained the 45 knots CAS maximum V_{S1} for other fixed-wing aircraft but proposed to increase the maximum V_{S1} for airplanes. Specifically, in § 61.316(a)(1), FAA proposed that if a pilot holds a sport pilot certificate, they may act as pilot-in-command of an aircraft (except for an airplane) that, since its original certification has a maximum stalling speed or minimum steady flight speed without the use of lift-enhancing devices (V_{S1}) of not more than 45 knots CAS except for airplanes. As proposed, airplanes would be required to have a V_{S1} speed of not more than 54 knots CAS at the aircraft's maximum certificated takeoff weight and most critical center of gravity. FAA received many comments (approximately 485) regarding the proposed maximum V_{S1} stall speed parameters for aircraft that sport pilots may operate. Many of these comments were in favor of an increase in V_{S1} stalling speed.

During review of the public comments, FAA found that the 54 knots limitation excluded some existing type-certificated airplanes that readily fit into a set of aircraft,[80] including one- to four-seat production airplanes, and may be operated by sport pilots given the training and certification requirements of a sport pilot certificate. While different makes of airplanes generally have different stalling speeds, the results of FAA analysis for pilot operations failed to find a correlation between increased fatality rates to a specific manufacturer of type-certificated production airplanes with higher V_{S1} stalling speeds. Moreover, the results of the analysis did not show substantive differences among fatal accident rates related to pilot loss-of-control (LOC) for the makes of airplane considered in the analysis.[81]

Given the similar performance of existing type-certificated aircraft with V_{S1} stalling speeds of 59 knots CAS or less, FAA finds that increasing the maximum V_{S1} stalling speed to 59 knots CAS will permit the inclusion of many similar production two- and four-seat airplanes, while continuing to appropriately limit the size, weight, and speed of airplanes sport pilots may operate given the training and certification framework for sport pilots. FAA did not propose to change the aeronautical experience requirements for a sport pilot certificate with airplane category and single-engine land or sea class privileges. These longstanding training requirements would not sufficiently prepare sport pilot applicants to operate airplanes that have a stalling speed greater than 59 knots CAS V_{S1}, which tend to be heavier, faster, and more complex. Furthermore, it was not the intent of the 2004 final rule nor this final rule to expand sport pilot privileges to operate aircraft with those more demanding characteristics.

FAA did not retain the direct weight limit for airplanes sport pilots may operate (as currently promulgated in the § 1.1 definition of light-sport aircraft) because some of these airplanes may meet the design limitations in § 61.316 (including the 59 knot CAS V_{S1} stalling speed), thereby constituting an aircraft within the sport pilot training and proficiency framework, but are slightly heavier due to having more robust airframes or safety features. Removing a prescriptive weight limit will encourage safety-enhancing features on more airplanes that were previously precluded from sport pilot operation solely due to the weight of the airplane. As technology and innovative designs advance, FAA finds design and performance limitations, such as stalling speed, are a more effective method of limiting airplanes that sport pilots can operate. The increase in the maximum stalling speed limit will also facilitate the use of more airplanes with a standard airworthiness certificate, which provides for increased load factor resilience, improved

cabin crash safety, more durable landing gears, and greater fuel capacity while still retaining very similar operating characteristics.

Therefore, in § 61.316(a)(1) this final rule retains the proposed V_{S1} CAS maximum stall speed of 45 knots CAS for all aircraft except airplanes; the maximum V_{S1} CAS stalling speed limit for airplanes that a sport pilot is permitted to operate will be 59 knots. The subsequent sections respond to comments received regarding FAA's stall speed proposal.

i. Comments Supporting an Increase to the Maximum VS1 Speed

Eleven associations, four manufacturers, and 333 individuals submitted comments generally supporting the proposal to increase the maximum V_{S1} stalling speed limitation. EAA, AOPA, NATA, and NBAA's consolidated comment broadly supported the rule but recommended increasing the proposed maximum V_{S1} speed of 54 to 58 knots to be more inclusive of FAA's targeted aircraft size. The joint comment stated, with the removal of the weight limitation, the proposed 54 knot stalling speed limit is too restrictive and that a higher V_{S1} stalling speed enables a higher V_A[82] maneuvering speed, which facilitates improved structural limits, handling, and safety during turbulence and gusty conditions. Commenters generally explained that, by increasing maximum stalling speed to qualify airplanes for sport pilot use, FAA would provide a more inclusive and targeted group of aircraft and capture a broader range of make and model airplanes with very similar performance and flight characteristics. Van's Aircraft and Piper Aircraft also suggested increasing the stalling speed to a minimum of 58 knots CAS to allow more legacy aircraft and questioned how FAA decided on the proposed V_{S1} 54 knots CAS limitation. Similarly, ALPA, AEA and ARSA, and 333 individual commenters supported increasing the maximum stalling speed and recommended increasing the maximum V_{S1} stalling

speed to various speeds, generally ranging from 54 knots (as proposed) to 70 knots. Commenters stated an increased maximum stalling speed would permit the use of more existing, legacy, or vintage training airplanes, including airplanes issued an experimental airworthiness certificate and kit planes, to ultimately increase the number of new pilots and could facilitate carriage of supplies.

GAMA supported the proposed increase in the size, performance, and scope of aircraft that can be flown by sport pilots and recommended increasing the maximum stalling speed to 58 knots CAS to capture a broader range of specific airplane makes and models with very similar flight characteristics, such as the Piper Archer model, which has a stalling speed just above 57 knots. GAMA also stated the suggested maximum 58 knot stalling speed remains below that of the primary category aircraft certification allowance, which is 61 knots, and is consistent with FAA's safety continuum.

Many commenters explained that the proposed 54 knot maximum stalling speed appears arbitrary and would exclude many production aircraft even though many of these aircraft have an excellent or proven safety record. Several comments opined that the current proposed V_{S1} CAS maximum stalling speed of 54 knots favors Cessna production airplanes and unduly prohibits the use of many Piper production airplanes by sport pilots, which a few commenters contend are easier to fly than some Cessna airplanes. When discussing which airplanes would be permitted to be operated by sport pilots due to increasing the stalling speed limitation, commenters referenced airplane manufacturers such as Cessna, Piper, Diamond, Beechcraft, Grumman, Vans, Stinson, Mooney, Cirrus, and Kodiak. Many commenters stated increasing the stalling speed a small amount would keep the maximum weight for these airplanes far below the expected 3,000-pound weight referenced in the NPRM. Some explained that the handling characteristics between

various legacy airplanes are marginally different, and a further increase would not adversely affect aviation safety.

As discussed at the beginning of this section, FAA agrees with the commenters that the proposed maximum V_{S1} CAS stalling speed of 54 knots is limiting and concurs with an increase in V_{S1} speed for the reasons provided. FAA has determined that a V_{S1} stalling speed of 59 knots permits the inclusion of many similar production two- and four-seat airplanes, and appropriately limits the size, weight, and speed of airplanes sport pilots may operate based upon the training and certification framework for sport pilots. Though commenters suggested stalling speeds up to 70 knots, as previously explained, the training requirements for a sports pilot certificate would not sufficiently prepare sport pilot applicants to operate airplanes that have a stalling speed greater than 59 knots $V_{S1,}$ as these aircraft tend to be heavier, faster, and more complex, thereby necessitating a higher degree of training and proficiency validation.

NAFI generally supported the proposed rule but had concerns regarding the clarity of the rule and possible misinterpretation. For example, it commented that the regulation states the stalling speed should be based on the "aircraft's maximum certificated takeoff weight and most critical center of gravity." It described that a late model Cessna 182 has a stalling speed of 54 knots CAS at its most rearward loading and a stalling speed of 56 knots CAS at its most forward loading. Since stability is reduced as the center of gravity moves rearward, NAFI's assumption is that the Cessna 182 qualifies as an aircraft a sport pilot would be able to operate under the new rule.

NAFI is correct that the V_{S1} CAS must be determined at the aircraft's maximum certificated takeoff weight and most critical center of gravity. However, FAA does not find this language to be unclear because the language gives the specific parameter where

the V_{S1} CAS would be determined. While FAA acknowledges the reduction in airplane stability as the center of gravity of the airplane moves rearward, FAA recommends consulting the aircraft's manual to determine the stalling speed limit. If the stalling speed limit in the airplane's manual is higher than the adopted regulatory limit of 59 knots V_{S1} in any configuration, a sport pilot is not permitted to operate that airplane. In response to the aircraft in NAFI's specific scenario, the V_{S1} CAS would be the higher 56 knot CAS, as this is the most critical center of gravity. If the aircraft's manual does not have a published $V_{S1,}$ FAA maintains published guidance with FAA-accepted methods for determining and documenting the V_{S1} CAS for an airplane in AC 90-89C, Amateur-Built Aircraft and Ultralight Flight Testing Handbook, including a method to determine CAS by conducting flight tests.

While AOPA, EAA, NATA, and NBAA recommended FAA increase stall speed to 61 knots CAS, they also urged FAA to consider a higher maximum stalling speed with the mitigation of installed safety-enhancing equipment. Some individual commenters suggested other limitations, such as a 180- or 200-horsepower powerplant limit or imposing a 3,000-pound weight restriction for light-sport category aircraft, while also permitting the installation of modern safety systems on new light-sport category aircraft and allowing four-seat configurations. Other commenters suggested permitting sport pilots to operate airplanes that publish a qualifying stalling speed in the utility category or permit them to operate an airplane that is re-certified using a new lower gross weight to qualify.

Installing safety-enhancing equipment in lieu of a stall speed limitation for aircraft a sport pilot can operate is not a suitable alternative because it would not effectively limit the weight and performance characteristics of aircraft a sport pilot may

operate. This final rule permits safety-enhancing equipment to be installed and used as long as the aircraft's V_{S1} CAS will not exceed the limits prescribed in § 61.316(a)(1) at the time of its original certification. In some instances, installing safety-enhancing equipment would increase weight; however, the stalling speed limitation effectively limits the weight of aircraft that sport pilots will be permitted to operate without providing further prescriptive parameters (e.g., a weight limit). In addition, FAA did not propose a powerplant horsepower limitation because it would be too prescriptive, unnecessarily restrict performance, and would not effectively limit the weight of aircraft used by sport pilots; even with a horsepower limitation the maximum gross weight of the aircraft would still be variable.

ii. Comments Opposing an Increase to the Maximum V_{S1} Speed

ALPA opposed increasing the maximum stalling speed limit for airplanes that sport pilots may operate and recommended retaining the 45-knot stalling speed limit for airplanes. ALPA stated the expanded light-sport aircraft category may entice some pilots to purchase a light-sport category aircraft instead of buying or using homebuilt aircraft. They further asserted it is likely that a significant group of pilots will migrate away from normal category aircraft or the use of private pilot privileges and move to the lower-cost light-sport category aircraft, which is lower in FAA safety continuum. ALPA stated it is not clear FAA evaluated the impacts on NAS safety under this rule proposal.

Since 2005, many pilots have already moved toward the use of light-sport category aircraft as less expensive options when conducting general aviation flight operations in the NAS. While ALPA suggested that pilots may be motivated to buy and fly more aircraft that are certificated under the light-sport category and provide a higher certification standard aircraft for light-sport category aircraft pilots to operate in the NAS,

FAA's current and adopted framework intends to safely facilitate a variety of aircraft to be available to pilots and does not find a reasonable basis to restrict groups of less costly aircraft via this final rule. FAA explained earlier that other amendments to the rules would improve safety more broadly within general aviation (GA) by making light-sport category aircraft a more appealing alternative to experimental aircraft that have higher fatal accident rates.

Instead, broadening the design and performance criteria of aircraft that a sport pilot may operate will allow sport pilots to operate many normal category general aviation aircraft, allowing greater choice and flexibility without incentivizing a particular aircraft certification category.

AEA and ARSA submitted a joint comment generally supporting the proposed revisions to the sport pilot design and performance limitations; however, AEA and ARSA stated the new V_{S1} limitation as written duplicates regulatory changes made by FAA three decades ago, referencing the Primary Category Final Rule.[83] These associations acknowledged that the primary category predated the development of industry-led aviation consensus standards and, as such, asserted the primary category has not been utilized for its intended purpose. AEA and ARSA also stated FAA previously supported 61 knots CAS in the Primary Category Rule as an acceptable level of single-engine airplane performance for safe operation by general aviation pilots but now FAA has proposed a different stalling speed without justification.

FAA disagrees that the new V_{S1} stalling speed limitation in the MOSAIC final rule duplicates the regulations provided by the Primary Category Final Rule. The Primary Category Final Rule established procedures in part 21 for type, production, airworthiness certification, and associated maintenance procedures for primary category aircraft, which

specified a 61 knot or less V_{S0} stalling speed limitation (as opposed to V_{S1}) for airplanes. When the Primary Category Final Rule was published in 1992, the sport pilot certificate and the certification of light-sport category aircraft under § 21.190 using consensus standards qualification had not yet been proposed or codified. This final rule intentionally separates aircraft certification requirements from pilot certification requirements, as the established 61 knot V_{S0} stalling speed limitation for the certification of primary category aircraft is a distinctly separate issue from the sport pilot aircraft limitation requirements of § 61.316. The former establishes aircraft certification requirements while the latter sets pilot operational requirements.

Furthermore, the Primary Category Final Rule adopted a V_{S0} stalling speed limitation of 61 knots or less, whereas this rule adopts a V_{S1} stalling speed limitation of 59 knots or less. As discussed later in this final rule, due to the inherent aircraft configuration differences, V_{S0} stalling speed will generally be lower than V_{S1} for any given airplane. As such, this final rule is not duplicative of the Primary Category Final Rule because the aircraft the Primary Category Final Rule authorized to be operated with a V_{S0} of 61 knots or less would have a significantly higher V_{S1} stalling speed than the 59 knots V_{S1} that is applicable to the airplanes that this final rule authorizes sport pilots to operate. FAA notes that sports pilots will be able to operate primary category aircraft so long as the limitations set forth in § 61.316(a) are met. Therefore, FAA does not agree that the MOSAIC final rule duplicates or contradicts the Primary Category Final Rule.

iii. Comments Specific to Using V_{S0} Instead of V_{S1} as the Maximum Stalling Speed Limitation

One hundred and two commenters suggested FAA consider using the published V_{S0} stalling speed instead of the V_{S1} stalling speed, ranging from 61 knots to 65 knots.

Commenters stated V_{S0} as the stalling speed would allow more certificated airplanes to qualify for sport pilot use. Commenters asserted the proposed V_{S1} limitation of 54 knots would be too low, excluding many existing airplanes, and stated the stalling speed in the landing configuration is more relevant when determining what airplanes are appropriate for a sport pilot to operate. Many commenters asserted the majority of fatal accidents occur in the landing phase (V_{S0}, flaps deployed configuration) of flight operations. Referencing the sport pilot landing accident statistics provided in the NPRM, one commenter asserted that most students and owners do not consider V_{S1} as a basis for stalling characteristics or behavior related to V_{S0}.

Some commenters stated using V_{S0} gives credit to aircraft designs that incorporate flaps or other high-lift devices satisfies the goal of allowing sport pilots to fly aircraft with slower approach and landing speeds, is closer to historical general aviation airplanes, enables stall-reducing devices like vortex generators to lower the stalling speed and permits more four-seat airplanes to qualify. One commenter recommended including airplanes without pilot-controlled flaps or lift-enhancing devices to satisfy the requirement specified by § 61.316(a)(1).

FAA identified NTSB accident data[84] that shows there were more fatalities in the departure phase (takeoff and initial climb, V_{S1} no flaps configuration) than in the arrival phase (approach and landing, V_{S0}, flaps configuration). NTSB states that takeoff begins at the application of takeoff power and the initial climb ends upon reaching enroute (cruise) altitude and the landing phase begins at flare and ends when the aircraft comes to a stop or exits the runway. Given the accident data from the NTSB and that departure for most light sport aircraft occurs in a V_{S1} configuration, FAA has determined that using V_{S1} maximum stalling speed limitation is more appropriate for indirectly limiting what

aircraft sports pilots can operate because more fatalities occur in the departure phase (V_{S1} configuration)

FAA notes that, due to the inherent aircraft configuration differences, V_{S0} stalling speed will generally be lower than V_{S1} for any given airplane. This final rule revises the existing maximum V_{S1} CAS stalling speed to 59 knots to indirectly limit cruise speed and other performance characteristics of airplanes that a sport pilot can operate, whereas use of the V_{S0} maximum stalling speed of 61 knots, at a minimum, would then substantially increase the V_{S1} stalling speed and further expand the performance characteristics of these airplanes. In turn, this would inappropriately permit sport pilots to operate larger, faster, and more complex airplanes outside the scope of their minimal training and experience requirements that a sport pilot receives. Further, V_{S0} can vary from V_{S1} stalling speed due to lift enhancing devices, such as flaps and slats, to lower the V_{S0} regardless of the size and weight of the airplane. FAA also recognizes that many aircraft are equipped with lift enhancing devices. Therefore, this final rule does not exclude airplanes with pilot-controlled flaps or lift-enhancing devices, as long the V_{S1} CAS is 59 knots at the aircraft's MTOW and most critical center of gravity without those lift-enhancing devices (as explicitly stated in adopted § 61.316(a)(1)). Existing airplanes universally have a lower stalling speed when deploying flaps and other lift-enhancing devices used during the approach and landing phase of flight and are otherwise in the V_{S0} landing configuration. In many instances, the V_{S0} stalling speed can range from 5 to 13 knots (or more) lower than the V_{S1} stalling speed in general aviation two or four-seat airplanes, but there is no direct and universal correlation between V_{S0} and V_{S1} such that controlling for V_{S0} would definitively and appropriately standardize V_{S1} based on a sport pilot's expected proficiency. Using V_{S1} CAS will more effectively limit airplane

performance characteristics to the training and skills expected of a sport pilot rather than a maximum V_{S0} stalling speed limitation of 61 knots, as suggested by commenters, which would permit airplanes with greater overall performance characteristics, thereby necessitating a greater level of pilot training and proficiency validation.

As a result, FAA has determined that using V_{S1} maximum stalling speed limitation is more appropriate to limit the aircraft available to sport pilots based on the performance characteristics appropriate for the minimum experience and training required of a sport pilot, which is significantly less than that of a private pilot. A sport pilot certificate allows a pilot to fly smaller, lighter aircraft with fewer training hours and medical requirements, making it a more accessible and affordable option for recreational flying. However, airplanes with a higher V_{S1} stall speed are larger and have performance characteristics that are more appropriate for the private pilot certificate, ratings, and privileges.

As previously discussed, FAA recognizes that V_{S1} stalling speed of 54 knots would have excluded many basic two- and four-seat legacy/type certificated airplane trainers. The increased V_{S1} of 59 knots, which will encapsulate more legacy and type certificated airplane trainers, will address many of the concerns of those individuals who provided comments specifically recommending the use of the V_{S0} stalling speed as the maximum stalling speed limitation for airplanes as a mechanism to expand the pool of aircraft sport pilots would be able to operate.

iv. Comments Recommending Additional Training and Endorsement Options

Several commenters recommended allowing sport pilots to obtain additional training and a subsequent instructor endorsement to permit sport pilots to operate airplanes with a V_{S1} stalling speed that exceeds 54 knots. As previously discussed, this

final rule will raise the maximum V_{S1} stalling speed from 54 to 59 knots, facilitating sport pilots to safely operate airplanes with similar performance and size characteristics common to two- and four-seat general aviation production airplanes. Therefore, it is unnecessary to adopt a specific training and endorsement regime for sport pilots to operate airplanes with a stalling speed greater than 54 knots.

v. Comments Recommending that Indicated Speed or Indicated V_{S1} Stalling Speed be Used Instead of Calibrated Speed as the Stalling Speed Limitation

Several commenters suggested using IAS instead of CAS to specify the maximum V_{S1} stalling speed limitation to qualify airplanes a sport pilot can operate. One commenter explained the majority of EAB aircraft owners do not determine calibrated stalling speeds because of the cost and complexity of flight testing and the lack of a requirement to do so, which in turn results in the exclusion of a large number of aircraft. Other commenters stated the stalling limit should reference IAS because of (1) its common use, (2) the necessity of referencing the POH table to determine CAS, and (3) the use of lifting devices to provide a mechanism to include older aircraft that do not publish CAS data. Other commenters explained that using V_{S1} CAS as the stalling limitation is problematic because many older aircraft do not publish the V_{S1} CAS or fail to provide an airspeed calibration conversion. These commenters recommended allowing indicated V_{S1} stalling speed to qualify airplanes that do not publish the CAS stalling speed.

FAA disagrees with using IAS instead of CAS to specify the maximum V_{S1} stalling speed value to qualify airplanes for sport pilot use, as IAS is not a true measure of the airplane's actual performance. Unlike CAS, IAS is not corrected for instrument and position errors, at times presenting errors up to 5 knots, affecting the aircraft’s eligibility

for sport pilot operations.[85] Thus, CAS is more precise and reliable for use in determining an aircraft's eligibility for sport pilot operations. In response to commenters noting that V_{S1} CAS is not always determined or published, FAA maintains published guidance with FAA-accepted methods for determining and documenting the V_{S1} CAS for an airplane in Advisory Circular 90-89C, Amateur-Built Aircraft and Ultralight Flight Testing Handbook, including a method to determine CAS by conducting flight tests.

vi. Comments Recommending FAA Permit Airplane Alterations to Lower the V_{S1} Stalling Speed to Qualify Airplanes for Sport Pilot Use

Sixteen commenters suggested FAA allow airplane alterations that lower the stalling speed. Six of these commenters recommended permitting aftermarket airplane alterations (e.g., vortex generators, short takeoff and landing kits (STOL), lift-enhancing designs) that lower the stalling speed to qualify for sport pilot operations. Ten commenters noted the proposed rule text, "since its original certification," in § 61.316(a) will unnecessarily exclude airplanes with aftermarket STOL kit installations or automatically deployed lifting structures, such as automated slats that can reduce the V_{S1} stalling speed below the proposed stalling speed limit for sport pilots. Another commenter suggested permitting after-market modifications in conjunction with an FAA-approved supplemental type certificate (STC) or through ASTM oversight. One commenter recommended modifying § 61.316(a) to state, "as currently approved." One commenter sought clarification on how to present an aircraft modification to FAA that lowers the stalling speed to qualify under § 61.316 and prove that an airplane qualifies for sport pilot use. Similarly, one commenter suggested allowing aircraft manufacturers to lower maximum gross weight limit to effectively lower the V_{S1} stalling speed for the airplane they produce so they can qualify for sport pilot use.

As discussed previously in the section describing stall speed limit requirements, FAA originally proposed a maximum V_{S1} CAS stalling speed of 54 knots. However, FAA agreed with commenters that this speed was limiting and determined an increase to a V_{S1} CAS stalling speed of 59 knots is appropriate and permits the inclusion of many type-certificated aircraft appropriate to the sport pilot certificate privileges and limitations intended in this rulemaking. Since FAA has already increased the originally proposed V_{S1} limitation and expanded eligible aircraft, FAA disagrees with additionally permitting airplane alterations after original certification that decrease the published V_{S1} CAS stalling speed. Allowing airplanes to meet the new 59 knots CAS V_{S1} requirement through the use of these modifications would inappropriately expand aircraft characteristics beyond those intended for sport pilot operations. These lift-enhancing devices would be considered major alterations because they may appreciably affect the weight, balance, structural strength, performance, flight characteristics, or other qualities affecting airworthiness that could affect the operation of the airplane. Therefore, FAA retains the § 61.316(a) rule text limitation that states "since its original certification." FAA notes it does not prohibit a manufacturer from submitting a new aircraft certification application to seek an airworthiness certificate designating a new CAS V_{S1} for the aircraft it manufactures. The new aircraft certification would become the "original certification," for purposes of applying § 61.316.

vii. Comments on Glider Stalling Speed

As previously stated, FAA did not propose, nor does this final rule revise the maximum stalling speed or minimum steady flight speed without the use of lift-enhancing devices (V_{S1}) of not more than 45 knots CAS currently set forth by § 1.1 for aircraft other than airplanes. A few commenters, including a joint comment from Soaring

Society of America (SSA) and the Soaring Safety Foundation (SSF), recommended increasing the maximum stalling speed from V_{S1} CAS of 45 knots to 54 knots for gliders a sport pilot can operate, stating the existing speed limitation prevents sport pilots from using modern gliders manufactured with safety cockpits and benign handling characteristics. Sonex Aircraft suggested an increase in the V_{S1} limit would allow the use of modern two-seat gliders for training and may better prepare a sport pilot for the enhanced performance characteristics of modern single-place gliders that fit within the existing 45 knot maximum stalling speed limitation. Sonex Aircraft also stated FAA did not provide data-supported justification for continuing to limit V_{S1} for gliders to 45 knots.

FAA does not find it appropriate to change the current V_{S1} 45 knot maximum stalling speed limitation at this time. Gliders with maximum stalling speed greater than 45 knots generally have more complex performance characteristics, resulting in less stability in flight and longer landing distances, and higher maximum gross weights. Those aircraft currently require a private pilot certificate to ensure the pilot has additional training necessary to safely operate the higher performance aircraft. FAA did not propose to change this requirement and does not have sufficient information on which to base such a change to these training requirements at this time.

Nonetheless, this final rule removes the weight limitation for light sport category aircraft certification and sport pilot use; therefore, glider manufacturers could build modern two-seat gliders that can meet the current V_{S1} 45 knot maximum stalling speed limitation. Given this consideration, and because gliders are inherently lighter than powered aircraft, FAA did not revise the stalling speed limit. Removing the weight limitation enables manufacturers to produce more robust and reliable airframes, including

the use of safety features, that still meet the existing glider stalling speed limit while expanding the pool of gliders a sport pilot may operate under this final rule.

viii. Comments on Weight Limitation

As explained in the NPRM[86] and previously in this preamble, the removal of weight limitation and, instead, application of maximum stalling speed will enable increased aircraft weights while also limiting the performance characteristics of the aircraft operated by sport pilots. ALPA and 17 individuals commented on the removal of the explicit weight limitation. Most comments supported removing the weight limitation for aircraft that a sport pilot can operate. Commenters who supported removal of the explicit weight limitation explained that it will enable sport pilots to access a larger variety of aircraft, facilitate innovation for new aircraft sport pilots can operate, and allow sport pilots to carry additional safety equipment or more fuel. Some commenters provided suggestions under the proposal to provide options for a sport pilot to either meet the 54 knot V_{S1} (or up to a 60 knot V_{S1}) limitation or a 3,000 pound maximum.

Given this final rule's increase in maximum stalling speed for airplanes and the removal of the weight limitation for all aircraft, FAA does not find it necessary to regulate based on weight or an option between stall speed and weight to meet the intent of the commenter's suggestion (i.e., facilitating slower, smaller, and more capable aircraft). The changes set forth in § 61.316 by this final rule will expand and encapsulate appropriate aircraft to address commenters' concerns regarding a narrow pool of aircraft. Commenters requesting to operate airplanes up to 3,000 pounds will find that many certificated airplanes at or above this weight will have V_{S1} CAS stalling speeds below the new 59 knot maximum and may be operated using sport pilot privileges, assuming the airplane meets all other § 61.316 requirements.

ALPA opposed removing the weight limit. ALPA explained the proposal would authorize the use of significantly heavier and larger aircraft, resulting in decreased safety of light-sport aircraft, and that would include normal category single-engine airplanes. ALPA recommended FAA include explicit weight restrictions in § 61.316 at the current weight restriction provided in § 1.1 (i.e., 1,320 pounds for aircraft not intended for operation on water or 1,430 pounds for aircraft intended for operation on water).

FAA maintains that allowing greater weight will enable manufacturers to build more robust, resilient, and reliable airframes, thereby contributing to and bolstering safety. Removing the weight limitation for aircraft, in conjunction with the other operational characteristic expansions (e.g., stall speed, seating capacity), will also enable use of many existing production aircraft and airplanes that hold a standard airworthiness certificate. However, FAA notes it is retaining the existing sport pilot privileges and limitations of § 61.315, which will continue to mitigate the risk involved in sport pilot operations even with the expansion in aircraft they are eligible to operate. In addition, weight is just one factor that affects operational characteristics. As discussed elsewhere in this final rule, removing the weight limit provides manufacturers the opportunity to include additional safety features that would otherwise have caused the aircraft to exceed weight limits. Therefore, this final rule does not retain the original weight limitation.

d. Altitude Limitations

Section 61.315 sets forth the privileges and limitations of a sport pilot certificate. This section includes, in pertinent part, that a sport pilot may not act as PIC of a light-sport category aircraft at an altitude of more than 10,000 feet MSL or 2,000 feet AGL, whichever is higher.[87] FAA did not propose any changes to this sport pilot altitude operating limitation in the NPRM. However, FAA received approximately 50 public

comments recommending that sport pilots be permitted to operate at higher altitudes. In addition to general requests for higher operating altitudes, commenters had differing recommendations on how to address the sport pilot altitude limitation specifically. Such recommendations included higher maximum altitudes based on (1) topographical and geographical considerations; (2) supplemental oxygen requirements; (3) training and endorsements; (4) aircraft separation; and (5) unique glider operations.

Most commenters suggested increasing the altitude limitation to address topographical and geographical considerations, such as the need for greater terrain clearance in mountainous areas, particularly the western contiguous United States. Specifically, FAA received several altitude suggestions including up to 3,000 feet AGL; up to 4,000 feet AGL in mountainous areas; 10,500 feet MSL for westbound travel; various altitudes between 12,500 feet MSL to 18,000 feet MSL; or the removal of all altitude restrictions.

As with many of the individual commenters, EAA, AOPA, NATA, and NBAA in a consolidated comment requested that FAA raise the sport pilot altitude limitation from 10,000 feet MSL to 12,500 feet MSL to allow for better clearance of mountainous terrain. These industry associations also supported raising the above-ground allowances in prominent mountainous areas. These commenters asserted further that an altitude limit of 12,500 feet MSL would eliminate the need to calculate AGL and would increase safety margins over treacherous areas. One individual described the altitude limitation as unnecessary and arbitrary, making some flights more dangerous by limiting the ability to use flight following and other ATC services and may increase the risk of controlled flight into terrain (CFIT). To allow for greater terrain clearance, many commenters stated

12,500 feet MSL would be a natural delineation and a more reasonable approach since supplemental oxygen is only required above this altitude.[88]

In addition to recommending a maximum altitude limitation of 12,500 feet MSL to align with supplemental oxygen rules in § 91.211, several commenters recommended the use of supplemental oxygen. For example, Van's Aircraft suggested the use of oxygen bottles and pulse oximeters for sport pilots to operate up to Class A airspace (18,000 feet MSL) to mitigate risks associated with unintended flight into IMC or CFIT. A couple of commenters contended that aircraft oxygen systems are "simple and easy" to use and make flying safer, allowing pilots to operate at higher altitudes for weather or terrain avoidance.

Van's Aircraft also recommended, along with several individual commenters, high-altitude or mountainous terrain training and endorsements for sport pilots to operate above the 10,000 feet MSL limitation. In EAA, AOPA, NATA, and NBAA's shared comment, the associations suggested that additional hypoxia awareness training would reduce the increased risk of hypoxia at higher altitudes. More specifically, a couple of commenters would like sport pilots to participate in hypoxia training, like normobaric hypoxia training devices or portable reduced oxygen training enclosure (PROTE), in order to receive a high-altitude endorsement. A retired flight instructor proposed amending the regulatory language in § 61.315(c)(11) to include ground and flight training and a logbook endorsement from an authorized instructor for sport pilots to operate up to 18,000 feet MSL.

Some commenters expressed concern about aircraft separation, especially in the western region of the U.S., stating that restricting sport pilots to an altitude limitation of 10,000 feet MSL will create traffic conflicts with faster light-sport category aircraft.

These commenters also believed that increasing the altitude limitation will safely facilitate more VFR cruising altitudes for mountainous areas. Another commenter stated a higher altitude limitation would afford sport pilots greater visibility to maintain cloud clearances and avoid mid-air collisions.

Lastly, two comments were specific to increasing the sport pilot altitude limitation for glider operations. One individual stated glider pilots regularly operate at altitudes above 10,000 feet MSL, especially in the Western United States. Commenters explained that gliders use the potential energy they gain from being at a higher altitude to generate the speed and lift needed for flight. Therefore, the commenters asserted that accidents may increase when forcing sport pilots to operate their gliders at a lower altitude.

With the introduction of the sport pilot certificate in 2004, sport pilot flight operations were originally limited to 10,000 feet MSL to separate sport pilot flight operations from high-speed aircraft operations that occur at those higher altitudes.[89] However, the 2010 Sport Pilot Final Rule recognized the burden this limitation placed on sport pilots (and students seeking a sport pilot certificate) who operated aircraft in areas of high elevation. Accordingly, FAA provided additional relief to sport pilots by permitting them to conduct flight operations up to and including 2,000 feet AGL in areas of mountainous terrain that may exceed 10,000 feet MSL.[90]

Commenters did not provide data supporting that operating below 10,000 feet MSL increases the risk of CFIT, mid-air collisions, traffic conflicts, and decreased access to ATC services. Every day, flights occur below 10,000 feet MSL throughout the United States with sufficient access to ATC services and flight following. Many of these flights operate under VFR during which the pilots are still responsible for terrain, obstruction, and traffic avoidance.

FAA notes that § 91.211, Supplemental oxygen, describes the requirement for the use of supplemental oxygen in both pressurized and unpressurized aircraft. While § 91.211(b) applies only to pressurized cabin aircraft, § 91.211(a) applies to all aircraft and requires that: (1) supplemental oxygen is provided and used by the required minimum flight crew for the part of the flight more than 30 minutes duration at cabin pressure altitudes above 12,500 feet MSL up to and including 14,000 feet MSL; (2) supplemental oxygen is provided to and used by the required minimum flight crew for the entire flight time at the altitude above 14,000 feet MSL; and (3) supplemental oxygen is provided to each occupant of the aircraft at cabin pressure altitudes above 15,000 feet MSL. For example, if a sport pilot is operating over terrain that is 12,500 feet MSL and the sport pilot chooses to operate at 2,000 feet AGL at that same location, the pilot would then be operating at cabin pressure altitude of 14,500 feet MSL and be obligated to use oxygen per § 91.211(a)(2).[91]

While oxygen levels are an important consideration in the 10,000 feet MSL or 2,000 feet AGL restriction, it is not the only consideration as to the limitation. Sport pilots are only required to possess a valid driver's license to operate an aircraft for daytime operations. The vision requirements for driver's licenses vary from state to state and differ from the criteria required to obtain an FAA medical certificate. FAA maintains that sharp, clear vision (with the best being equal to 20/20 vision) requires significant oxygen. Without supplemental oxygen, an individual's vision declines measurably as pressure altitudes increase. As altitude increases, the available oxygen decreases, degrading vision along with cognitive and physical performance in general. The increased risk associated with operations in unpressurized aircraft at altitudes greater than the current sport pilot allowance of 10,000 feet MSL or 2,000 AGL, whichever is higher,

is not sufficiently mitigated with the possession of a driver's license, as it would be with an FAA medical certificate that evaluates vision and pulmonary function. In addition, sport pilots are trained and tested on only basic aeromedical factors. Specifically, for airplane single-engine land and sea privileges, the applicant must exhibit knowledge of the elements related to aeromedical factors by explaining (1) the effects of alcohol, drugs, and over-the-counter medications and (2) the symptoms, causes, effects, and corrective actions of at least three of nine given factors.[92] Conversely, higher grades of certificates require substantially more training and testing on aeromedical factors, as well as altitude and airspace considerations to facilitate operations at those higher altitudes and airspace. For example, the Private Pilot for Airplane Category ACS[93] requires substantially more human factors training and proficiency validation, including the demonstration of understanding of twelve different aeromedical and human factors, as well as risk management of aeromedical and physiological issues and hazardous altitudes.

While additional training and possible endorsements for a sport pilot could be considered if the training met the same higher-grade certificate requirements, the more stringent medical requirements for these higher-grade certificates would not be addressed. Similarly, sport pilots operating gliders do not meet the medical requirements to safely operate above the current altitude limitation. If individuals seek to operate aircraft at altitudes higher than the sport pilot altitude limitation, those individuals can seek a higher grade of pilot certificate that properly mitigates the risk associated with high-altitude operations.

As previously stated, FAA did not propose any amendments to § 61.315(c)(11) in the NPRM, and, as such, it is not within scope to finalize in this rulemaking. Moreover, given all these considerations, FAA maintains the current altitude limitation set forth in

§ 61.315(c)(11) is appropriate and will not adopt commenters' requests to increase the sport pilot altitude limitation. Retaining the sport pilot altitude limitation aligns with the safety continuum referenced in the NPRM, which addressed increased risk when operating aircraft in the NAS. Therefore, this final rule does not adopt any changes to the sport pilot maximum altitude operating limitation.

e. IFR Privileges

Section 61.3(e) sets forth the requirements to act as pilot in command of a civil aircraft under IFR or in weather conditions less than the minimums prescribed for VFR flight. This section generally requires the appropriate aircraft category, class, type (if class or type is required), and instrument rating on that person's pilot certificate for any airplane, helicopter, or powered-lift being flown.[94] Neither sport pilots nor subpart K flight instructors are permitted to operate in IMC. In addition, sport pilots may not obtain an instrument rating, as § 61.65(a)(1) requires that a person who applies for an instrument rating must hold at least a current private pilot certificate or be concurrently applying for such.

FAA did not propose any revisions to the status quo of instrument rating restrictions and basic instrument training requirements; however, FAA received approximately 70 comments pertaining to such privileges. Commenters generally recommended that FAA permit sport pilots to obtain instrument training, an instrument rating, or a similar operating privilege (e.g., operation under IFR via an endorsement). Many of these commenters suggested that allowing sport pilots to obtain an instrument rating would improve sport pilot proficiency, lower insurance costs, and result in safer sport pilots, especially with inadvertent encounters with IMC. Some commenters recommended FAA permit basic or limited IFR rating or privileges for sport pilots,

suggesting limitations such as requiring visual meteorological conditions for departures and approaches, only allowing IMC operations above 1,500 feet AGL to allow sport pilots to maintain safe flight operations in difficult weather conditions, and only requiring a driver's license to qualify for operating under instrument flight rules. Several commenters, including the Gyrocopter Flight Training Academy, specifically requested IFR operations be permitted in gyroplanes or gliders. Fly Eagle Sport did not explicitly suggest an expansion of IFR privileges for sport pilots but suggested the requirement for student pilots seeking a sport pilot certificate to log flight time by reference to flight instruments before conducting solo cross-country flights in an aircraft with a V_H greater than 87 knots should be only for night flights. FAA also received comments considered to be out of scope of this rulemaking (e.g., broad general changes to instrument currency in § 61.57). NAFI implied in its comment that flight instructors with a sport pilot rating (subpart K) may be operating under instrument conditions.

Certificated sport pilots will have received some degree of instrument experience during their training. Before a person can fly solo, a person must have a student pilot certificate, as set forth in subpart C of part 61. A student pilot must meet the requirements of § 61.93 prior to (1) conducting a solo cross-country flight or any flight greater than 25 nautical miles from the airport from where the flight originated, and (2) making a solo flight and landing at any location other than the airport of origination.[95] Because sport pilot training must include these scenarios (e.g., solo cross-country experience), a person seeking a sport pilot certificate must have a student pilot certificate. As a general requirement, student pilots must receive and log training (in pertinent part) in the procedures for operating the instruments and equipment installed in the aircraft to be flown.[96] As it pertains to student pilots receiving training for cross-country flights in a

single-engine airplane, § 61.93(e) includes the generalized training, as well as control and maneuvering solely by reference to flight instruments if the airplane utilized for training has a V_H (maximum speed in level flight with maximum continuous power) greater than 87 knots CAS.[97] To note, if a student pilot seeks a sport pilot certificate utilizing an airplane that has a V_H less than 87 knots during training, the person would not be required to complete this training at that time. However, if the then-certificated sport pilot sought to operate an airplane with a V_H less than or equal to 87 knots CAS, the pilot must meet the requirements of § 61.327(a).[98]

While FAA may explore further expansion of privileges in the future, FAA declines to permit sport pilots to obtain an instrument rating or similar instrument privilege (e.g., the use of training and endorsements) at this time. These changes would be out of scope to finalize here. In addition, as previously explained, sport pilots are not eligible to add an instrument rating, unless they are concurrently seeking a private pilot certificate with the instrument rating.[99] The additional training and qualification requirements for a private pilot certificate and instrument rating are necessary to ensure that a person is appropriately prepared with a commensurate level of fundamental training to operate safely in IMC conditions and when conducting operations under instrument flight rules in the NAS, as operating under IFR presents additional challenges to pilots because visual references can be limited or unavailable.

Specifically, the minimum aeronautical experience requirements for a sport pilot certificate are significantly less than what is required for a private pilot certificate in providing a base level of aeronautical experience for those privileges associated with an instrument rating. For example, under § 61.109(a), an applicant for a private pilot certificate with an airplane category and single-engine class rating must log at least

40 hours of flight time, with additional experience for the instrument rating required by § 61.65(d) or (g), as appropriate. In addition, applicants are tested on basic instrument maneuvers during the practical test for the private pilot certificate with airplane category rating.[100] Comparatively, those seeking a sport pilot certificate with airplane category and single-engine class privileges only need a minimum of 20 hours of flight time, without required specific training by reference to instruments or any testing of basic instrument maneuvers as required by the sport pilot PTS. Private pilots also receive additional training in cross-country and night operations beyond the minimum required to obtain a sport pilot certificate. Furthermore, to exercise the privileges of their certificate, private pilots must meet more stringent medical qualification requirements than sport pilots.

FAA supports additional flight training from an authorized instructor to improve pilot proficiency as a desirable practice promoting safety. There is no prohibition for a pilot, including a sport pilot, to accomplish additional flight training from an authorized instructor that can include instrument training; for example, a sport pilot may be concurrently training for a private pilot certificate and an associated instrument rating or obtaining flight training that is not mandated in the regulations for a sport pilot certificate, such as instrument proficiency flight training. Seeking additional training to become proficient when operating an aircraft solely by reference to the flight instruments is normal practice. As previously stated, sport pilots are restricted from operating an aircraft solely by reference to the flight instruments, but their basic training on procedures for operating the instruments and equipment installed in the aircraft to be flown intends to mitigate situations where the sport pilot may inadvertently enter IMC. FAA notes that it does not regulate based on what third-party insurance companies may require for coverage.

One commenter suggested expanding subpart K instructor privileges to permit these instructors to obtain an instrument rating and conduct IFR operations in aircraft that meet instrument equipment requirements. This commenter also stated permitting subpart K instructors to be eligible for an instrument rating is consistent with FAA's safety and privileges continuum across pilot certifications and ratings.

To provide flight training under § 61.93(e)(12) on control and maneuvering an airplane solely by reference to the flight instruments for the purpose of issuing a solo cross-country endorsement under § 61.93(c)(1) to a student pilot seeking a sport pilot certificate, a flight instructor with a sport pilot rating must meet the requirements provided in § 61.412(a) through (c), notably including a one-time endorsement from a subpart H authorized instructor certifying the person is proficient in providing training on control and maneuvering solely by reference to instruments. Like sport pilots, flight instructors with a sport pilot rating (subpart K flight instructors) are not eligible for an instrument rating for the same reasons a sport pilot is not eligible. Further, while subpart K flight instructors may obtain additional training from a subpart H authorized instructor, which permits them to provide training solely by reference to instruments, this training does not equal that foundational training provided by private pilot qualification or concurrent qualification for a full instrument rating. Rather, it is limited instruction to train sport pilots how to deal with time-limited conditions that interfere with visual reference capabilities.

In summary, FAA did not propose expansion of privileges for sport pilots to include privileges encompassed by an instrument rating, nor did this rulemaking consider permitting sport pilots to add an instrument rating or any other instrument privilege for sport pilots to operate in IMC in the NAS. As such, this change is out of scope for this

final rule. For the previously discussed reasons, FAA maintains that if a pilot seeks to operate in IMC, they must obtain at least a private pilot certificate with an instrument rating and otherwise satisfy any other requirements specified in parts 61 and 91 to operate in IMC as pilot-in-command.

f. Business Use

Under § 61.315(c), sport pilots may not act as PIC of an aircraft for compensation or hire or in furtherance of a business. FAA did not propose expanding sport pilot privileges to allow conduct of any kind of commercial-related operations. FAA received many comments suggesting FAA should permit a sport pilot to conduct flights for hire, for compensation, or in the furtherance of a business. Some suggested revisions such as adding a requirement to log a certain number of hours, receive an instructor endorsement, or permit flights incidental to business, such as commuting to business meetings. Other commenters suggested revisions to clarify the definition of "business" and what kinds of business-tangential operations are permitted. One commenter explained the value of being able to travel to a worksite or work-related meetings and referenced environmental considerations, including reduced emissions compared to using a motor vehicle. Another commenter stated there is no difference in safety or additional risk when being paid to take a passenger or when just giving a ride. One commenter suggested commercial privileges should be granted to flight instructors with a sport pilot rating (subpart K flight instructors). Another commenter indicated that limiting gyroplanes to a seating capacity of two potentially restricts commercial use such as crop dusting, aerial photography, sightseeing, search and rescue, etc.

Several commenters, including LAMA and USUA, recommended FAA consider allowing "commercial ratings" for powered parachute and weight shift control aircraft

pilots or establishing alternative pathways for pilots to engage in aerial work. LAMA and USUA asserted that commercial privileges would (1) provide regulatory consistency by extending "commercial ratings" to powered parachutes and weigh-shift-control aircraft; (2) provide economic benefits of allowing the use of powered parachutes and weight-shift-control aircraft as low-cost alternatives for aerial work, aerial photography, and scouting; and (3) improve safety by providing a legal pathway to perform aerial work in these aircraft. Some commenters suggested that aerial work[101] should include activities like agriculture or construction operations, real estate, natural disaster surveillance, aerial photography, surveying, search and rescue, observation and patrol, aerial tours, and aerial advertising.

FAA understands commenters' interest for allowing "commercial ratings" for powered parachute and weight shift control aircraft. However, this final rule does not permit sport pilots to conduct flight operations in the furtherance of a business or to obtain commercial privileges in this final rule. The 2004 final rule that implemented the sport pilot certificate intended the associated privileges to be limited to sport and recreational flying only. FAA maintains there would be an increase in risk if sport pilots were permitted to conduct commercial operations because of the limited minimum experience requirements and qualifications required to obtain a sport pilot certificate compared to that of a commercial pilot certificate. For example, commercial pilot certificate requirements include, but are not limited to, holding an FAA medical certificate, obtaining higher minimum experience requirements, and more detailed training and testing standards. FAA has long maintained that pilot operations involving commercial activity or compensation, except for a few exceptions under § 61.113, must include holding a commercial or airline transport pilot certificate, as appropriate. FAA

has long held the principle that when compensation is exchanged for transportation the public expects, and FAA demands, a higher level of safety. In addition, a framework allowing sport pilots to conduct commercial operations is outside the scope of this rulemaking and would require public notice and comment.

Under this final rule, sport pilots will be able to operate a broader array of aircraft, which could include primary category and experimental aircraft; it follows that flight instructors with a sport pilot rating will, therefore, provide flight training in such aircraft. In 2024, FAA finalized a rule that reinforced its longstanding position that, though excepted from the part 119 requirement to obtain an air carrier or commercial operator certificate,[102] compensated flight training in limited, experimental, and primary category aircraft is an operation that involves the carriage of a person for compensation or hire. FAA has historically found it appropriate to permit flight instructors with a sport pilot rating conducting flight training to receive compensation; however, this privilege is not specifically enumerated in the regulations.[103] Therefore, this final rule adds § 61.413(d) to state that, notwithstanding the compensation and business use restrictions in § 61.315(c)(2) and (c)(3),[104] a person with a flight instructor certificate with a sport pilot rating may receive compensation for providing flight training in accordance with subpart K of part 61. FAA emphasizes that a person who is providing flight training in an aircraft continues to be subject to part 91, including the requirements to operate certain aircraft for the purposes of flight training as set forth in § 91.326 (i.e., obtaining a letter of deviation authority).

Finally, and relatedly, Aero Sports Connection (ASC) Inc. recommended FAA permit sport pilots to provide "transition-for-hire" services in an aircraft issued a special airworthiness certificate with an experimental designation with stall speeds less than

35 knots. ASC supported its recommendation by discussing the history and use of exemptions to permit certain ultralight operations that were later terminated with the publication of the sport pilot 2004 final rule. While ASC is a proponent of a pilot providing flight training without holding a flight instructor certificate, FAA finds this recommendation to be outside the scope of this rulemaking.

g. Aircraft Conformity Since Original Aircraft Certification

Currently, the § 1.1 definition of light-sport aircraft sets forth criteria that an aircraft must meet since its original certification. In the 2004 final rule, FAA explained the rule intended to prevent modification to aircraft with high payload and performance characteristics, which would exceed the defined parameters of light-sport aircraft. FAA further explained that modifications to an aircraft to meet the light-sport aircraft definition may increase its complexity to a level that is inappropriate for the skill and training capabilities of the sport pilot.[105] With the proposed elimination of the light-sport aircraft definition in § 1.1, FAA retained the tether to original certification in proposed § 61.316, which, as previously discussed, sets forth the performance limits and design requirements for aircraft a sport pilot may operate. Specifically, the new § 61.316(a) proposed to set forth the limitations of an aircraft that a sport pilot may operate "since its original certification," and, similarly, new § 61.316(b) proposed to permit certain sport pilots[106] to act as PIC of an airplane that possesses retractable landing gear or a controllable pitch propeller "since its original certification."

FAA received comments concerning § 61.316(a) and (b) and the tether to an aircraft's original certification. A number of commenters recommended FAA remove this requirement, thereby allowing aircraft modifications (e.g., through STCs, STOL kits, vortex generators, and aftermarket improvements) after original certification to satisfy the

design and performance limitations listed in new § 61.316(a) or (b). Several commenters, including Hartzell Propeller, stated limiting aircraft characteristics to the aircraft's original certification for purposes of § 61.316 will prohibit the use of older airplanes that qualify for an STC permitting the installation of aftermarket vortex generators or wing tip cuffs that can lower the stall speed to qualify aircraft for sport pilot operations. FAA disagrees with commenters' recommendations to remove "since its original certification" from § 61.316(a) to permit aftermarket modifications, including through an STC, that could reduce the existing V_{S1} CAS airplane stalling speed and possibly qualify larger and heavier airplanes for sport pilot use. This final rule increases the maximum V_{S1} CAS stalling speed for airplanes that a sport pilot is permitted to operate from 54 to 59 knots. The change in the maximum V_{S1} CAS stalling speed limit will allow the use of additional existing production airplanes without aftermarket kits or other modifications after original certification to qualify for sport pilot use, functioning to address commenters' general concerns regarding aircraft availability. Installation of aftermarket STOL kits or other lift enhancing devices would facilitate heavier aircraft that have an original V_{S1} CAS stalling speed exceeding the § 61.316 stalling speed limit. Heavier, faster aircraft usually equate to more complex aircraft, operation of which are not commensurate with the skill and training required for a sport pilot certificate.

FAA emphasizes that installation of STOL kits after an aircraft's original certification is still permitted. However, the airplane's original aircraft certification V_{S1} CAS stalling speed, prior to the installation of the STOL kit, must not exceed the new maximum V_{S1} CAS stalling speed limit of 59 knots, as set forth in § 61.316. To clarify, if an aircraft is certificated and then an aftermarket installation alters the V_{S1} CAS airspeed from 61 to 59 knots, the airplane would not qualify for sport pilot use because the

alteration affecting stalling speed was accomplished after the original certification of the aircraft. FAA maintains that based on the safety continuum concept, individuals operating airplanes with a V_{S1} CAS stalling speed greater than 59 knots must obtain at least a recreational pilot certificate or higher grade of pilot certificate. After consideration of the commenters' recommendations, FAA maintains that the "since its original certification" language proposed in § 61.316(a) does provide a necessary safeguard to indirectly limit the weight of aircraft sport pilots may operate by limiting modifications after its original certification.

Three commenters explained the tether to an aircraft's original certification as proposed in § 61.316(b) would unnecessarily exclude Piper Cubs that were originally equipped with a controllable pitch propeller and later converted to a fixed pitch propeller. One commenter suggested FAA should allow constant speed propellers since its original certification.

FAA finds that post-certification alterations to the propeller or landing gear will not fundamentally change the weight or utility of airplanes and could provide valuable performance and safety enhancements. Accordingly, FAA determined it would be unnecessary to prohibit sport pilots from operating airplanes with modifications to the propeller or landing gear configuration. Therefore, FAA has removed "since its original certification" from § 61.316(b) in this final rule to permit sport pilots to operate aircraft that have had landing gear (except for gliders) modifications and airplanes that have had propeller modifications if those sport pilots meet the training and endorsement requirements set forth in § 61.331. However, § 61.316(a) retains "since its original certification" requirements; because gliders are specifically required in § 61.316(a)(7) to have fixed or retractable landing gear, the glider must have had that fixed or retractable

landing gear since its original certification. FAA determined the exception contained in § 61.316(b) was unnecessary for gliders because it is extremely rare for a glider to convert to a retractable system as most manufacturers have two versions of gliders if they intend to offer a retractable system. Therefore, this is not a common modification for this type of aircraft, and an exception is not necessary. Moreover, FAA notes that gliders, in general, were not affected by this rulemaking, and existing eligibility requirements for gliders to qualify as light sport aircraft were not changed and were merely carried over from 14 CFR 1.1.

Conversely, paragraph (8) requires fixed landing gear for powered aircraft (other than a glider), but contains an exception for those retractable landing gear operations in accordance with paragraph (b) (therefore permitting modifications).

h. Gyroplane Specific Issues

In this final rule, FAA removes the light sport aircraft definition from § 1.1 and relocates the performance limits and design requirements to § 61.316. FAA retains the following requirements that pertain to a gyroplane: seating capacity of no more than two persons including the pilot (as discussed in IV.H.1.a of this preamble); a fixed-pitch, semi-rigid, teetering two-blade rotor system (adopted § 61.316(a)(4)); fixed or retractable landing gear (adopted § 61.316(a)(8)); and non-pressurized cabins (adopted § 61.316(a)(3)). FAA received four comments specific to gyroplanes, three of which recommended FAA permit sport pilots to operate gyroplanes with limits and design limitations that differ from the proposed § 61.316 aircraft limitations. One commenter requested revision to proposed § 61.316(a)(6) that would limit sport pilots to operating gyroplanes that have a fixed-pitch, semi-rigid, teetering-two blade rotor system. The commenter stated rotor systems with three or more blades reduce the vibrational modes

associated with two-blade rotor systems, which can reduce the maintenance requirements and extend the fatigue life of gyroplane components. In addition, the commenter stated there is no inherent increase in pilot skill level required to operate a gyroplane with a three-blade rotor system when compared to a two-blade, teetering rotor system. Two commenters asked to be able to conduct a jump takeoff. These commenters stated jump takeoff gyroplanes are easier to take off, with one commenter stating these aircraft are computer controlled.

FAA does not agree with allowing sport pilots to operate a three-blade rotor system gyroplane. While FAA appreciates that there may be benefits to operating a three-blade rotor system, FAA disagrees that there is no inherent increase in pilot skill level required to operate a gyroplane with a three-blade rotor system when compared to a two-blade, teetering rotor system. A three-blade rotor system is an inherently more complex system than a two-blade, teetering rotor system. While vibrations may be lower in a three-blade rotor system gyroplane, as suggested by the commenter, the addition of the third blade creates an increase in the risk of an imbalance in the rotation of the gyroplanes rotor occurring (i.e., ground resonance). As such, a three-blade rotor system requires specific training and experience, particularly in ground resonance that is not covered in the sport pilot training and PTS for gyroplane.[107] Given the increased complexity of the three-blade rotor system gyroplane compared to the two-blade gyroplane, teetering system, and given that most gyroplanes are currently experimental, operation of the three-blade rotor system gyroplane would be outside the scope of their minimal training and experience requirements.

With respect to the jump takeoff comments, FAA does not restrict pilots, including sport pilots, from conducting a jump take-off. Gyroplanes capable of jump

takeoff did not meet the definition of light-sport aircraft under the 2004 rule because of weight. For that reason, the commenters may have interpreted FAA's rules to prohibit the maneuver. However, under this final rule, there is no longer a weight restriction.

Gyrocopter Flight Training Academy (GFTA) urged FAA to continue to support the existing process of transitioning fixed wing pilots to light-sport gyroplanes via a flight instructor gyroplane endorsement and separate proficiency check conducted by a different sport pilot instructor. FAA notes this final rule retains the ability for a pilot to add a rotorcraft gyroplane sport pilot privilege by obtaining additional training and instructor endorsement and subsequent successful completion of a proficiency check in accordance with § 61.321(a).

i. Balloon Experience

The NPRM did not propose changes to the required aeronautical experience for a lighter-than-air category and balloon class privilege on a person's sport pilot certificate as set forth in § 61.313. However, FAA received a comment recommending removal of the cross-country requirement for a sport pilot seeking a lighter-than-air balloon privilege. Section 61.313(f) requires an applicant to log at least 2 hours of cross-country flight training. FAA finds this comment and suggestion to be outside the scope of this rulemaking and does not currently find sufficient evidence to revise this requirement in this final rule. Any changes to sport pilot experience requirements for a balloon privilege must be addressed in a separate rulemaking to allow adequate notice and an opportunity for the public to comment and FAA may consider rulemaking on this topic at a future date. As a result, FAA maintains the cross-country experience requirement for a sport pilot seeking a lighter-than-air category, balloon class privilege.

j. Night Operations

Currently, § 61.315(c) restricts a sport pilot from acting as pilot in command of an aircraft at night.[108] FAA proposed to permit sport pilots to operate at night by accomplishing additional night training and experience requirements, including obtaining an endorsement from an authorized instructor, as set forth in proposed § 61.329. As explained in the NPRM, currently, sport pilots do not have night operation privileges because a sport pilot does not receive any training for operations at night; however, this creates a safety risk in scenarios where pilots may feel pressure to conduct flights before the end of evening civil twilight, especially in many northern states with reduced daylight hours. To appropriately mitigate night operations, especially with the expanded aircraft characteristics that a sport pilot can operate, FAA maintains that additional night training, an authorized instructor qualifying endorsement, and additional medical qualifications are necessary. Therefore, in new § 61.329, FAA proposed to require three hours of flight training at night from an authorized instructor, a logbook endorsement certifying proficiency, at least one cross-country night flight, and ten takeoffs and landings at night with an authorized instructor. In addition, to account for visual acuity standards required for night operations, FAA proposed to require a sport pilot seeking to act as PIC at night to hold, at a minimum, an FAA medical certificate issued under part 67, subpart D, Third-Class (or higher) Airman Medical Certificate or meet the requirements of § 61.23(c)(3), and conduct the operation consistently with § 61.113(i).[109] Proposed § 61.329(d) also specified that if a sport pilot met the requirements of § 61.23(c)(3), § 61.329 controls if there is a conflict with § 61.113(i).[110]

Most comments regarding the proposed sport pilot night operations supported night operations, including the proposed training and endorsement requirements. For

example, AOPA, EAA, NATA, and NBAA's consolidated response, AutoGyro Certification LTD, and several individual commenters agreed with requiring minimum night training and allowing sport pilot night operations, citing various benefits such as promotion of better aeronautical decision-making, removal of pressure to terminate a flight or to reach a destination as darkness sets in, enhancement of the utility of light-sport aircraft, and greater flexibility for sport pilot certificates. However, most comments opposed the medical qualification requirement. As subsequently discussed, this final rule generally adopts proposed §§ 61.315(c)(5) and 61.329 and revises proposed § 61.329 to: specify category and class training requirements, correct regulatory references, and harmonize the minimum experience requirements with that of the private pilot certificate minimums.

This section discusses (1) the training and endorsement requirements for sport pilot night operations, (2) qualifications to provide night flight training to sport pilots, and (3) medical eligibility requirements specific to sport pilot night operations.

i. Training and Endorsement Requirements for Sport Pilot Night Operations

The training and endorsement requirements facilitating night operations under new § 61.329(a) and (c) will require a sport pilot to receive three hours of flight training at night from an authorized instructor and receive a logbook endorsement, which includes conducting at least one cross-country flight at night, and accomplish at least ten takeoffs and landings at night. In the NPRM, the regulatory text could be read to indicate that the three hours of flight training at night (proposed § 61.329(a)) must have been conducted separately from the ten takeoffs and landings at night (proposed § 61.329(c)) (i.e., that a person could not count a takeoff and landing performed during the three hours of flight training as counting toward the minimum requirement of ten). Conversely, proposed

§ 61.329(b) was clear that the cross-country flight at night could be counted toward the flight training under proposed § 61.329(a). While a person could conduct more than 10 takeoffs and landings with an authorized instructor should the person feel it necessary, FAA did not intend to mandate more than a minimum of ten takeoffs and landings. In addition, higher grades of pilot certificates that include night privileges only require a minimum of ten takeoffs and landings,[111] and FAA finds no reason a sport pilot should be required to conduct more than 10. This final rule amends § 61.329 to make clear the three hours of night flight training from an authorized instructor (adopted as § 61.329(a) introductory text) must include both the cross-country flight at night (adopted as § 61.329(a)(1)) and ten takeoffs and landings (adopted as § 61.329(a)(2)).

GAMA recommended that FAA only require 10 takeoffs and landings at night in the new sport pilot category and class privilege, including an instructor endorsement. In addition, GAMA explained that a flight instructor with a sport pilot rating may have night experience in another sport aircraft category or class of aircraft.

First, FAA disagrees with the recommendation to limit the minimum night training requirement when adding an additional category or class privilege at the sport pilot level to only 10 takeoffs and landings at night (i.e., eliminating three hours of flight training in proposed § 61.329(a) and the cross-country flight in proposed § 61.329(a)(1)), and further addresses BasicMed in the following section. The three hours of flight training at night and the cross-country flight experience is intended to provide necessary training in specific areas of night operations that a person may not receive with only a series of take-offs and landings: for example, different techniques in pilotage and dead reckoning, diversions and lost procedures, and emergency operations. FAA notes the night training requirements in § 61.329 largely mirror those required to add an additional

category or class rating for private pilots, as set forth in § 61.109, as well as current sport pilot experience requirements under § 61.313 due to the different handling requirements between category and classes of aircraft generally and at night. FAA maintains this experience is necessary to ensure safe sport pilot operations and finds no data to support allowing less experience than these existing requirements.

However, in assessing GAMA's comment, FAA noted neither the takeoff and landing requirement, nor the other general training requirements, were explicitly required for each specific category and class privilege; however, the preamble explained the intent to generally mirror the night training requirements of the private pilot certificate. In addition, the proposed regulatory text in § 61.329(a) stated the proficiency endorsement was required in "the" aircraft, indicating particular aircraft training as required. FAA acknowledges these considerations could lead to differing conclusions as to the aircraft specificity for the training and endorsement (e.g., category and class, make and model, etc.). In recognition of the unique pilot skills needed to operate various characteristics of aircraft at night safely (e.g., night landings in single-engine airplanes vs. helicopters), and the similar night currency requirements under § 61.57(b)(1)(ii), FAA intended to require the night training and proficiency requirements specific to category and class of aircraft. Therefore, this final rule revises § 61.329(a) to require the night flight training and proficiency endorsement to be conducted in the specific category and class privilege for which the pilot intends to operate.[112]

Section 61.313 requires certain aeronautical experience to apply for a sport pilot certificate, including minimum: flight time and flight training; cross-country flight training; certain takeoff, launch, and landing requirements; or any combination of the preceding, as applicable. Under the proposal (and as adopted by this final rule), a person

could count time and experience to meet § 61.329 toward the aeronautical experience requirements of § 61.313, as long as all requirements set forth in the applicable experience and logging provisions were met. For example, if a person received one hour of flight training at night from an authorized instructor in a single-engine airplane, under the proposal and this final rule, the person could log that flight time toward both §§ 61.313(a)(1) (requiring at least 15 hours of flight training from an authorized instructor) and 61.329 (requiring at least 3 hours of flight training at night from an authorized instructor). ALPA expressed concern that allowing § 61.329 night experience to satisfy some of the current § 61.313 minimum experience requirements would be inappropriate because the experience requirements for a sport pilot certificate, in general, are already low. ALPA suggested the 3 hours of training at night be in addition to the 15 hours of instruction required to acquire a sport pilot certificate.

FAA disagrees with the recommendation that the three hours of night training experience requirement be in addition to the 15 hours of training. While FAA understands ALPA's concern, the 15 hours of flight training required by § 61.313(a) is a minimum time requirement. A pilot's learning and skill level may require more than the minimum 15 hours of flight training to obtain the aeronautical knowledge and flight proficiency required for a sport pilot certificate. Incorporating the § 61.329 night training requirements into the minimum time requirement does not reduce the overall required flight training. Because night operations and training are more challenging and demanding than day operations, night pilot time experience qualifies equally for the minimum total training time requirements. Finally, the successful completion of a practical test with an FAA-designated pilot examiner or proficiency check with an

authorized instructor, as appropriate, validates that a person is qualified to operate an aircraft as a sport pilot.

GAMA, AOPA, EAA, NATA, and NBAA's consolidated comment; an individual; and LAMA suggested that if a pilot has already been trained at night, that training should count for the sport pilot night experience requirements and a pilot with a higher grade of certificate should be eligible under § 61.329 without endorsement. Similarly, an individual commenter recommended allowing sport pilot night operations if previously qualified as a private pilot with an airplane single-engine land rating, without requiring BasicMed.

A person with a sport pilot certificate may credit night experience acquired from previous pilot flight training or night experience when properly documented in a pilot's logbook or record. For example, because a person who holds a private pilot certificate with an airplane single-engine rating has completed the night flight training specified by § 61.109(a)(2) (i.e., three hours of night flight training that includes one cross-country flight of over 100 nm and 10 takeoffs and landings), that experience may be applied to meet certain requirements in new § 61.329. However, when exercising the privileges of a sport pilot certificate and operating at night, the sport pilot must have obtained the requisite endorsement under § 61.329, regardless of whether the pilot holds a higher grade of pilot certificate with a higher class medical.

Commenters' recommendation to allow pilots with a higher grade of certificate to be eligible for night privileges based on previous experience without meeting BasicMed inaccurately correlate medical eligibility standards with training and endorsement. Persons with higher grades of certificates may choose to exercise the privileges of a sport pilot certificate because they no longer meet the medical qualification requirements to

exercise privileges of a higher grade of certificate. As discussed throughout this section, FAA maintains that minimum medical qualifications are necessary for sport pilots to safely operate at night and will not remove the medical requirement when a person may hold a higher-grade of certificate, but exercises sport pilot privileges at night.

ii. Qualifications to Provide Night Flight Training to Sport Pilots

The NPRM proposed to permit a person to receive the night training and endorsement specified in § 61.329 from an authorized instructor: a person who holds either a flight instructor certificate issued under subpart H of part 61 or a flight instructor certificate with a sport pilot rating under subpart K. Subpart H flight instructors receive training and validation of proficiency via testing on night operations to receive their certificate and are therefore qualified to provide flight training at night. For example, the Flight Instructor for Airplane ACS includes various night operations tasks and elements (e.g., Task M: Night Operations in Area of Operation II: Technical Subject Areas, which includes knowledge, risk management, and skills specifically key to night operations). This final rule adopts the proposal permitting subpart H instructors to provide § 61.329 night flight training.

In the NPRM, FAA recognized it would be an unnecessary burden to require sport pilots to find only subpart H flight instructors for night flight training and, therefore, proposed additional training requirements to qualify flight instructors with a sport pilot rating to provide instruction at night. Specifically, FAA proposed to add new paragraph (n) in § 61.415, which prescribes the limits of a flight instructor certificate with a sport pilot rating. The NPRM proposed, and this final rule adopts, that a flight instructor with a sport pilot rating may not provide training in an aircraft at night unless they have completed the night training and endorsement requirements specified in proposed

§ 61.329 (i.e., receive three hours of flight training at night from an authorized instructor and receive a logbook endorsement, conduct at least one cross-country flight at night, and accomplish at least ten takeoffs and landings at night). Therefore, a flight instructor with a sport pilot rating must receive the required § 61.329 training and endorsement from a subpart H instructor or an authorized subpart K flight instructor with a sport pilot rating who has received the § 61.329 training and endorsement. Upon completion of the § 61.329 training and endorsement, a flight instructor with a sport pilot rating may instruct sport pilot applicants, sport pilots, or flight instructors with a sport pilot rating in an aircraft at night and provide the required endorsement once the instructor finds the person is proficient in night flight (pursuant to new § 61.329). To clarify, a flight instructor may only provide instruction at night in the category and class privilege for which they hold the § 61.329 training and endorsement.

FAA finds the initial cadre of subpart K flight instructors with a sport pilot rating who may provide night training will be sufficiently established through subpart H flight instructors, who, as previously discussed, have received training and validated proficiency via the ACS or PTS (as applicable) night operations tasks. However, during the pendency of the rulemaking and while addressing glider specific pilot training and certification comments, FAA noted the absence of night training or testing requirements in the flight instructor glider PTS for subpart H flight instructors. FAA recently examined this absence of a task in the ACS IBR Final Rule, where commenters recommended adding a night operations task to the flight instructor for glider category PTS.[113] FAA responded that there was not an urgent, safety sensitive reason to expand the footprint of the flight instructor test (and, resultingly, across all certificate levels) in the ACS IBR Final Rule. FAA continues to find it inappropriate to expand the testing standards in this

final rule, as the addition of an area of operation in a PTS would require notice and an opportunity to comment and would affect more than only the Flight Instructor for Glider PTS, and, as such, it is not within scope to finalize in this rulemaking. However, FAA finds that subpart H glider flight instructors (who will be responsible for establishing the initial cadre of subpart K glider flight instructors, who will then train and endorse glider sport pilots on this brand-new privilege) will be sufficiently experienced to train and validate proficiency for this narrow group of glider sport pilots via the minimum requirements in § 61.57(b). Specifically, the subpart H flight instructor (who will be acting as PIC of the glider carrying a person) will be required to have made at least three takeoffs and three landings to a full stop in a glider during the period beginning 1 hour after sunset and ending one hour before sunrise within the preceding 90 days.

FAA received a comment on flight instructor experience requirements specific to night training and qualifying instructor endorsement. The commenter recommended flight instructors with a sport pilot rating and 50 hours of logged night time as a private pilot or higher be exempted from the night experience requirement or only be required to obtain a night endorsement, with no specific hourly requirement.

As discussed in the previous section, FAA will recognize night training experience acquired as a private pilot or with a higher grade of pilot certificate. However, FAA maintains that a subpart K flight instructor must obtain a minimum of three hours of night training, including a qualifying endorsement validating proficiency, from either a subpart H instructor or an authorized subpart K flight instructor with a sport pilot rating who has received the § 61.329 training and endorsement before providing night instruction to a sport pilot seeking night privileges, rather than simply requiring a minimum amount of flight training. As it pertains to private pilots, FAA finds it

unnecessary to require higher flight training requirements for private pilots (e.g., 50 hours as suggested by the commenter) because a flight instructor with a sport pilot rating who is also a private pilot would inherently meet the experience requirements of adopted § 61.329(a), as they largely mirror the private pilot night qualification requirements.[114]

iii. Medical Eligibility Requirements Specific to Sport Pilot Night Operations

As previously stated, FAA proposed minimum medical qualification requirements to act as PIC with a sport pilot certificate during night operations in § 61.329(d). Specifically, FAA proposed that a person must either hold a medical certificate issued under part 67, subpart D (at least a third-class medical certificate), or meet the requirements of § 61.23(c)(3) as long as the person holds a valid U.S. driver's license. In addition, the proposal would require the operation to be conducted consistent with § 61.113(i) and that § 61.329 would take precedence in any conflict between §§ 61.113(i) and 61.329.

Many commenters recommended FAA: (1) not require a third-class medical certificate[115]; (2) remove the requirement to obtain an initial medical certificate and permit BasicMed to be the sole medical eligibility requirement; (3) permit possession of a valid driver's license or a separate visual acuity test to be the basis for medical eligibility; and (4) remove medical eligibility requirements altogether.[116] Conversely, other commenters stated the medical eligibility requirements do not appropriately mitigate safety concerns and that FAA did not sufficiently support and justify its decision to require either a third-class medical certificate or BasicMed to exercise the sport pilot privilege of nighttime flight. This section responds to these categories of comments.

However, in this final rule, FAA retains the proposed medical requirements that a person may only act as PIC with a sport pilot certificate during night operations if that

person either holds at least a third-class medical certificate or meets the conditions of § 61.113(i) and the operation is conducted consistent with § 61.329. FAA notes this was originally proposed as § 61.329(d) but will be redesignated in this final rule due to the consolidation of proposed § 61.329(a) through (c), as previously described, as § 61.329(b).

During the pendency of the rulemaking, FAA noted the preamble in the NPRM inadvertently referenced § 61.315(d)(4) when explaining the controlling regulation in the event of a conflict while § 61.329(d) (adopted herein as paragraph (b)) in the amendatory instructions cited "this section" (i.e., § 61.329). This final rule adopts revised § 61.329(b) to state that if the privileges and limitations in § 61.113 conflict with § 61.316 when sport pilots are operating aircraft with either a medical certificate or U.S. driver's license for BasicMed under § 61.23(c), new § 61.316 performance limitations and design requirements control (i.e., the intent explained in the NPRM preamble). For example, § 61.113(i) includes a limitation that the aircraft is authorized to carry not more than seven occupants; under adopted § 61.316(a)(2), a sport pilot could only operate an aircraft with a maximum seating capacity of two persons, except for airplanes, which may have a maximum seating capacity of four persons. The latter will control under this final rule.

The NPRM did not propose conforming amendments to § 61.23 but adopts two revisions in this final rule to deconflict the provisions of § 61.23 with the night operation medical certification requirements. Specifically, § 61.23(c)(1) sets forth the specific part 61 operations requiring either a medical certificate or U.S. driver's license, paragraph (c)(3) sets forth the requirements to operate under BasicMed with a U.S. driver's license (e.g., have held a medical certificate after July 14, 2006, complete the

part 68 medical education course). FAA finds it necessary to add sport pilot night operations into the enumerated operations of § 61.23(c)(1), as those operations will require either at least a third-class medical certificate or a driver's license with BasicMed conditions and limitations (as set forth in §§ 61.113(i) and 61.23(c)(3)).

Relatedly, § 61.23(b) sets forth those operations that do not require a medical certificate, including: (1) when exercising the privileges of a student pilot certificate while seeking a sport pilot certificate with glider or balloon privileges, (2) when exercising the privileges of a sport pilot certificate with privileges in a glider or balloon, and (3) when exercising the privileges of a flight instructor certificate with a sport pilot rating in a glider or balloon. FAA recognizes a conflict between these regulations, which do not require any medical certificate or meeting BasicMed, compared to the requirements of § 61.329, which will require either a medical certificate or BasicMed for all subpart J and K operations at night. For the reasons set forth in the NPRM and this section in response to comments opposing FAA's medical determination, FAA finds it necessary to require these populations of pilots to meet minimum medical qualifications.

Therefore, to address both conformities, this final rule adds new § 61.23(c)(1)(vi) and redesignates current paragraph (c)(1)(vi) as new paragraph (c)(1)(vii) and current paragraph (c)(1)(vii) as new paragraph (c)(1)(viii). New § 61.23(c)(1)(vi) will add the exercise of sport pilot certificate privileges at night under the conditions and limitations set forth in § 61.113(i) as an operation requiring a driver's license and conformance with § 61.23(c). This paragraph will also contain notwithstanding language from § 61.23(b)(1), (b)(2), and (b)(6) to make clear that sport pilots conducting night operations will require either a third-class medical or BasicMed, in spite of the more relaxed regulations for gliders (and balloons) in § 61.23(b).

In general, some commenters stated the medical eligibility requirements in § 61.329(d) provide an unnecessary regulatory burden on sport pilots, void the purpose of the sport pilot certificate, and will result in continued unsafe flying practices for night operations.

FAA does not find the requirement to comply with this final rule's medical requirements to be an undue burden for sport pilots seeking to exercise night privileges. Sport pilots seeking night privileges have two options for satisfying the medical requirements in this rule: (1) obtaining a third-class medical certificate or, (2) satisfying the BasicMed requirements. Both are well-established options under FAA's existing regulatory framework and for which there is an existing market of aviation medical examiners[117] and, in the case of BasicMed, state-licensed physicians. With both options, there is a physical exam focusing on findings that could indicate an aeromedical concern.[118] FAA does not set the fee for the exam; the cost depends on local market conditions. However, FAA recommends that AMEs charge the usual and customary fees by other physicians in the same locality for similar physical examination services.[119] In a previously issued final rule, FAA assessed the average cost for a BasicMed examination to be $117 in 2016 dollars, which roughly translates to $155 in present year dollars.[120]

This final rule expands the privileges available to sport pilots to include night operations. To address the increased risks associated with night operations,[121] FAA determined it is both reasonable and appropriate to ensure that sport pilots exercising night privileges meet the minimum medical qualifications in this rule. Obtaining a medical examination is a relatively minor burden to validate a sport pilot's medical qualification to exercise expanded privileges. Moreover, existing standards allow a sport pilot to conduct operations without obtaining a medical certificate or satisfying

BasicMed. A sport pilot is only affected by the additional medical qualification requirements if that sport pilot chooses to exercise these optional new night privileges. FAA discusses the challenges, risks, and specific reasons supporting the medical qualification requirement in the paragraphs that follow.

FAA disagrees that the requirement for sport pilot night medical qualifications will result in unsafe flying practices; on the contrary, the medical qualification requirements intend to bolster and mitigate unsafe medical conditions that may result in unsafe night operations. In addition, commenters did not provide or cite specific unsafe flying practices that medical qualifications would contribute to for FAA to consider in this final rule. FAA emphasizes that pilots are responsible for adhering to regulations in general. Failure to satisfy those regulatory requirements creates unacceptable risk to the public and can result in suspension or revocation of one's pilot certificate. As subsequently discussed in this preamble, certain medical conditions and vision deficiencies provide unacceptable risk associated with the conduct of sport pilot night operations in the NAS.

Also, as discussed in this section, pilots who hold a higher grade of pilot certificate and elect to exercise sport pilot night privileges may take advantage of these sport pilot privileges, if qualified. FAA anticipates that many pilots conducting operations under BasicMed qualifications will transition to using a driver's license medical qualification to conduct sport pilot operations going forward, especially given the expansion of airplanes that sport pilots will be permitted to operate under this final rule. For example, some pilots that previously complied with BasicMed to operate basic general aviation aircraft using private pilot privileges will now be eligible to operate their aircraft with sport pilot privileges and a driver's license. They may choose to follow the

sport pilot path because it presents fewer requirements than BasicMed, so long as they do not conduct night operations.

iv. Comments Related to Third-Class Medical Certificate

Many commenters opposed the proposed medical eligibility option of a third-class medical certificate to conduct night operations. Some commenters suggested requiring a third-class medical is ineffective, stating sport pilots may be reluctant to seek a third-class medical certificate because of the possibility of receiving a denial, which then results in disqualifying sport pilot certificate privileges altogether. Other commenters recommended changes to FAA's medical qualification regulations generally. AOPA, EAA, NATA, and NBAA's consolidated comment ("the consolidated comment"), USUA, and several individual commenters asserted the third-class medical certificate requirement defeats one of the purposes of a sport pilot rating certificate, the certificate's utility, and does not offer a safety benefit since third-class medical standards under part 67 do not require night vision tests.

Many commenters suggested alternatives to the medical requirements to mitigate any vision considerations and concerns. One commenter opined that pilots who have previously held a medical certificate at any time and have had no significant changes to their vision are at very low risk for decreased visual performance at night and should not be required to provide any additional medical certification to fly at night. The consolidated comment suggested evidence of a successful colorblindness test in lieu of a medical certificate. The consolidated comment and Helicopter Association International, now known as Vertical Aviation International (VAI), recommended sport pilots receive a one-time verification that the sport pilot previously held a third-class medical without a night limitation or accomplish a self-certification that they can distinguish red, green, and

white lights. In support, the commenters state that color vision is congenital and inherently stable regardless of age in the absence of eye disease. Another commenter suggested that FAA should permit sport pilots to self-certify for night operations or pass an FAA-accepted (color) vision test, citing current § 61.303(b)(4) as already providing a medical mitigation.

Similarly, LAMA explained that pilots who previously held an FAA medical without a night restriction have already demonstrated their ability to meet the color recognition requirements for night operations, rendering a full medical certificate or a BasicMed review unnecessary to ascertain color vision capabilities. LAMA further explained that FAA already offers multiple color test options to demonstrate compliance with the color recognition requirements of night flight and evidence of compliance could be handled by a simple certification from someone qualified to carry out an appropriate test. An individual commenter noted the standards for the color blindness test were recently improved with updated guidance on acceptable tests by FAA's Office of Aerospace Medicine and suggested FAA remove medical certificate requirements from proposed § 61.329.

Prior to this final rule, there were no means for a sport pilot to act as PIC of an aircraft at night. FAA emphasizes the medical qualification requirements for general sport pilot operations were not proposed to be revised in the NPRM (i.e., those requirements set forth by § 61.303, currently), as some commenters suggested. Only sport pilots who seek to operate at night will be required to maintain a higher level of medical qualification. Therefore, under this final rule, sport pilots may continue to operate (during the day) with a current and valid U.S. driver's license. Sport pilot certificate utility will not be affected or reduced by not pursuing a third-class medical or satisfying BasicMed

requirements. In fact, by virtue of expanding the performance and design characteristics of aircraft sport pilots may operate, and by facilitating night operations without having to seek a higher grade of certificate (e.g., a private pilot certificate), this rule bolsters sport pilot certificate utility in a safe manner.

Night training and the associated night-time operational privilege are an "optional" sport pilot privilege; a pilot who chooses not to conduct night operations may simply continue to meet the medical requirements set forth in § 61.303. However, FAA proposed additional medical qualification for night flight due to the differing flight characteristics and safety risks by virtue of conducting operations in daylight versus night. To note, the medical qualifications proposed, and adopted by this final rule, do not require a person to hold a third-class medical certificate at the time of night operation, as some commenters suggest. Section 61.329(b) simply provides a pathway for sport pilots to be able to fly at night if they are able to meet the medical eligibility requirements of a third-class medical certificate or BasicMed.

However, there are a number of medical deficiencies that may impair safe night flight operations that FAA seeks to mitigate in adopted § 61.329(d) by requiring either a third-class medical certificate or BasicMed. For example, medical conditions such as cardiac disease, lung disease, blood disorders, and cataracts affect blood flow to the eyes and brain, which may impact a pilot's operational ability. Further, various medications and medical conditions such as heart disease, pulmonary disease, vestibular problems, and neurological diseases can independently or collectively impair a person's performance at night, lending credence to the minimum requirement for medical qualifications.[122]

In addition, as was often raised by commenters, the medical qualification seeks to ensure a pilot possesses key visual characteristics, such as depth perception, visual acuity, and color vision to identify terrain and obstacles, read instrumentation, and judge landing paths. For example, adequate vision is more critical to ensure safe night flight operations such as collision avoidance, airport, runway, and taxiway identification, flight instrument use, recognition of adverse weather conditions, and other required tasks unique to night flight operations. Other considerations that affect the safety of flight at night include susceptibility to turbulence, G-forces, spatial disorientation, night illusion issues, and autokinesis. Night operations affect pilot performance especially when operating at altitudes as high as ten thousand feet MSL (or higher in mountainous terrain) in an unpressurized aircraft. In addition, certain health conditions that may be manageable during day operations can become a significant pilot performance issue when operating an aircraft at night, such as cardiac disease, lung disease, blood disorders, and cataracts that affect blood flow to the eyes and brain. Also, some medications intended to mitigate certain health conditions can negatively impact pilot performance during night operations, such as antihistamines, some medications for erectile dysfunction, some antidepressants, anti-malarial medications, steroids, and tamoxifen.

Third-class medicals require vision tests, which include testing for color and acuity vision deficiencies, equally valid for day and night operations. As explained, the intent of requiring a third-class medical (or BasicMed) is not limited to only identifying visual anomalies (e.g., colorblindness, low visual acuity); however, these are important factors that are addressed during an FAA medical exam (and a driver's license visual exam, as subsequently discussed). FAA does not provide a freestanding vision test nor is FAA considering accepting color vision tests as a standalone medical qualification

because, as previously discussed, FAA finds comprehensive health validation necessary. The requirement to have successfully obtained and held at least a third-class FAA medical after July 14, 2006, verifies that an individual has met the Federal health standards for that medical certificate at some point in time, which would have verified corrected vision acuity of at least 20/40 and that the individual does not have color vision deficiencies. Even if the individual's FAA medical certificate expires after that date, it is still valid to qualify for BasicMed.

However, FAA acknowledges that color vision is not always static and deficiency can be acquired and change over time and with age. Red and green color deficiency is typically congenital, whereas blue and yellow color vision deficiency is typically acquired. As previously stated, different medical conditions can affect color vision adversely (e.g., cataracts, multiple medications). In addition, because BasicMed only requires a third-class medical to have been obtained at some point after July 14, 2006, FAA acknowledges that aging and other natural physical deteriorations could affect a person's ability to conduct night operations. Third-class medical certificate validity periods ensure medical fitness for night operations and, likewise, BasicMed ensures there is not exclusive reliance on holding a medical certificate in the past without any other verifying mechanism through the general medical standards and visual acuity required to obtain a driver's license.

FAA also disagrees with utilizing self-certification for pilot color vision validation; as previously explained, the medical qualifications proposed and adopted herein are intended to ensure a range of physical performance limitations, one of which includes visual acuity. Many medical conditions that impede pilot performance,

especially at night, can be difficult to self-assess or diagnose without a qualified medical professional conducting an evaluation or medical testing.

v. Comments Suggesting Using BasicMed Without Requiring an Initial Medical Certificate

Twenty-one commenters recommended FAA create alternatives for medical qualification in addition to the third-class medical certificate and BasicMed options. Some commenters questioned the utility of BasicMed as a measure of medical qualification. Commenters recommend that FAA apply the BasicMed requirements generally but not require the pilot to have held a medical certificate after July 14, 2006, which would eliminate the requirement in § 61.23(c)(3) when applied to sport pilots. Some of these commenters suggested that, in addition to BasicMed being the sole medical eligibility requirement, FAA should impose additional requirements, such as an endorsement or recurrent training, as an alternative means to determine eligibility instead of requiring a medical certificate. A few of these commenters stated requiring a medical certificate may have varying impacts on pilots, such as being more difficult for younger pilots who need to obtain a third-class medical certificate to qualify. In addition, a commenter explained that the 20-year safety record for sport pilots has proven sport pilots are more than competent to know their own limitations. Another commenter contended that pilots who have previously held a medical certificate at any time, and have had no significant changes to their vision, are at very low risk for decreased visual performance at night and should not be required to provide any additional medical certification to fly at night. Though many commenters disagreed with requiring a medical certificate as a medical eligibility requirement, a few commenters generally disagreed

with FAA allowing BasicMed as medical eligibility requirement sport pilots, and more specifically sport pilot night operations.

To emphasize, BasicMed is not the sole requirement for a sport pilot to operate at night; rather, it is one of two options a sport pilot may choose from to conduct sport pilot operations at night. If a person finds it more convenient and attainable to seek a third-class medical certificate, the sport pilot will not need to follow BasicMed provisions, and vice versa. As previously explained, the option for either qualification standard will provide flexibility to sport pilots, ensuring safety while also recognizing the recreational intent of sport pilot certificate use (as opposed to, for example, higher medical certificate requirements for commercial pilot operations).

Further, FAA is unclear whether commenters referred to removing the BasicMed requirements that a person must have held an initial medical certificate sometime after July 14, 2006, to qualify for BasicMed,[123] or misunderstood how a current third-class medical was not a requirement but rather one of two options in § 61.329(d). If the former, this rule did not propose and will not make changes to the general regulatory framework of BasicMed.[124] As previously explained, the medical eligibility requirements in § 61.329 ensure the sport pilot has, at some point, been physically evaluated for safe night operations to a third-class medical standard.

One commenter asserted there is plenty of data to prove that allowing BasicMed without the medical requirement is safe but did not provide that supporting data. Another individual commented that the 20-year sport pilot safety record is substantial proof that a driver's license medical is more than adequate to permit night operations. While the current driver's license requirement facilitates day operations for sport pilots, it does not facilitate night operations. Therefore, FAA finds the commenters' references to data

overgeneralized and not relevant at this time, as this is a new operation for sport pilots under this final rule.

vi. Comments Recommending FAA Permit the Possession of a Valid Driver's License as the Basis for Medical Eligibility for Sport Pilot Night Operations

Sixty-three commenters recommended permitting the use of only a valid driver's license to medically qualify for sport pilot night operations, instead of requiring a third-class medical certificate or BasicMed, citing burden and cost on sport pilots wishing to operate at night (as previously discussed), conflicts with standing requirements in § 61.303, and alleged lack of safety need or evidence. While some commenters recommended holding a U.S. driver's license (considering any applicable limitations) as the sole medical eligibility requirement for sport pilot night operations, others suggested FAA permit the use of a driver's license with alternative requirements, such as a vision test or additional training.

Several commenters, including Fly Eagle Sport, suggested that possession of a driver's license alone should be sufficient justification for a sport pilot night operations, contending that a person's ability to operate large buses, trucks, or other non-commercial vehicles, such as passenger vans or motorhomes, with just a driver's license to qualify to operate at night because driving these vehicles only requires possession of a driver's license. An individual commenter referenced a 2009 National Highway Traffic Safety Administration study that concluded only 1.3% of all personal vehicle crashes are a result of medical emergencies, stating it would be safe to assume data could be extrapolated to aircraft accidents. Some individual commenters opined driver's licenses should be sufficient because states have vision requirements to obtain driver's licenses and may impose night driving restrictions on licensed motor vehicle operations.

Possession of a driver's license alone, including a non-commercial or commercial driver's license with a DOT Medical Exam, does not adequately qualify a sport pilot for night operations as many medical conditions that may significantly affect a pilot's ability to operate an aircraft safely, especially at night (as discussed in the preceding sections), are not adequately screened for in obtaining a state-issued driver's license**.** The DOT Medical Exam referenced by these commenters is used by the Federal Motor Carrier Safety Administration to medically qualify commercial motor vehicle drivers. Unlike BasicMed and medical exams conducted under part 67, medical providers conducting DOT Medical Exams are evaluating the applicant based on the assumption that the applicant is intending to operate a motor vehicle, not an aircraft. Accordingly, the exam provider may not be considering some of the unique aeromedical aspects, such as the effect of medications at altitude or effects on the applicant's vestibular system. General health conditions cannot be mitigated in an aircraft by simply pulling over to the side of the highway, as a driver of a motor vehicle may be able to do. By requiring the applicant to at least meet the requirements for BasicMed, the PIC has received at least one baseline part 67 aeromedical exam, mitigating risk of a medical condition that could cause a potential hazard at night.

In addition, FAA finds the suggested fatality rates associated with motor vehicle medical emergencies to be an insufficient basis upon which to determine a driver's license alone is sufficient for safe aircraft operations, as the safety considerations between cars and aircraft operating at night differ considerably. For example, typical speeds for operating a motor vehicle are significantly less and there is little need to scan more than a ¼ to ½ mile ahead visually. If a driver encounters bad weather, becomes ill, or has a mechanical issue it is normally easy to pull over to the side of the road safely or

slow to reduced speeds to address any hazards. Conditions such as spatial or visual disorientation are generally limited, traffic avoidance is much more predictable, and any atmospheric pressure or oxygen level changes are gradual and negligible, generally. Conversely, typical speeds in flight are significantly faster than a motor vehicle and pilots require the visual acuity to scan miles ahead of an aircraft. If a pilot encounters bad weather, becomes ill, or has a mechanical issue, emergency diversions are far more complex and may take longer to achieve a safe landing considering time to descend from altitude and distance from a suitable landing site. The option to make an immediate landing may not be safe or reasonable. Traffic avoidance in an aircraft at night requires greater scan intervals ranging from 180 to 200 degrees to see and avoid traffic and obstructions. Flight altitudes, especially above 5000 feet, have an additional effect on the human body.

Vision and other medical standards that permit the operation of a motor vehicle vary substantially from state to state and in most instances do not validate color vision. Because of the lack of standard vision requirements from state to state (or territory), and the interval at which these vision tests are conducted, the risk associated with medical deficiencies for pilots operating at night is not properly mitigated using only a U.S.-issued driver's license and would otherwise expose the public to unacceptable operational risk during night flight operations. In addition, periodic medical examination (associated with a medical certificate or BasicMed) is necessary to validate that a person is minimally fit to safely operate an aircraft, particularly at night. As the complexity and risk associated with flight operations increase (i.e., through expansion of night privileges and aircraft that a sport pilot may operate), the level of safety must also increase; here, a minimal level of medical eligibility.

Further, no conflict exists between the adopted requirements of § 61.329(b) and the standing requirements of § 61.303. As explained, the NPRM did not propose revisions to the medical requirements set forth in § 61.303 to operate during the day. Adopted § 61.329 simply prescribes a higher medical qualification requirement for those pilots who choose to operate at night. Should a pilot only operate during the day, that pilot may meet the minimum requirements of § 61.303, as currently set forth.

Some commenters opined on the relationship between higher-level certificates, sport pilot operating privileges, and BasicMed. Some stated individuals qualifying under BasicMed will seek a higher grade of pilot certificate permitting night operations. Another commenter recommended keeping the current driver's license medical requirement for operating light-sport category aircraft and extending its use to apply to the private pilot certificate. A few commenters requested additional clarification on when a pilot with a higher-grade pilot certificate exercising sport pilot privileges may use a driver's license for medical qualification. LAMA and several individual commenters recommended pilots holding a higher pilot certificate and who had previously held an aviation medical without any night restrictions should be automatically allowed to exercise night privileges without the need for any additional medical review providing they continue to hold a current driver's license.

Pilots holding a higher grade of pilot certificate (i.e., private, commercial, or air transport pilot (ATP)) can exercise the privileges of a sport pilot certificate using a valid driver's license as the medical qualification. However, the operating limitations of that higher grade of pilot certificate will apply[125] and pilots holding a higher grade of pilot certificate must still comply with the § 61.329(b) medical requirements to operate as PIC at night. It is generally settled that certificated pilots can exercise the privileges of a lower

grade of pilot certificate within the limitations provided for that lower grade of pilot certificate; therefore, FAA does not find a table clarifying privileges associated with a driver's license medical qualification is necessary. A private pilot or higher grade of certificate can exercise the privileges of a sport pilot certificate, likewise subject to a sport pilot's operating limitations. However, just because a pilot may hold a higher-level certificate does not mean the person should be automatically eligible for sport pilot operations from a medical qualification perspective. Many pilots hold higher-level certificates but choose to operate lower-level certificate operational privileges because the person may not be able to meet the higher-grade medical qualifications commensurate with the level of risk (i.e., a first-class medical certificate for ATP privileges). In this case, the same reasons apply that require the person to hold some level of medical qualifications, either through at least a third-class medical certificate or BasicMed. Conversely, if the pilot held a valid higher-level medical certificate (i.e., first- or second-class medical), then that pilot could operate with a sport pilot certificate at night, as the regulatory text specifies that "a medical certificate" must be held.

vii. Comments Recommending Vision Test in Combination with Unrestricted Driver's License for Night Operations Instead of a Medical Certificate or BasicMed

FAA received approximately 140 comments recommending a vision test or similar test to medically qualify for sport pilot night operations instead of any basic medical requirements (i.e., at least a third class medical or BasicMed). Many of these commenters explained that obtaining an FAA medical or satisfying BasicMed requirements is an excessive or overburdensome medical qualification requirement for sport pilots to operate at night. Commenters generally described that most pilots who possess a sport pilot certificate, or exercise sport pilot privileges, do so because they do

not want to seek an FAA medical certificate due to cost or because the possibility that a denial could jeopardize their sport pilot privileges overall. Because of these concerns, many commenters explained that most sport pilots will not seek night privileges. Some commenters suggested that instead of the proposal, FAA permit an eye exam conducted by a health professional who can verify acceptable night vision, with a variety of suggestions ranging from specific vision test parameters, minimum night experience requirements, logbook endorsement, or a combination thereof.

As previously explained, a vision test alone is insufficient to permit sport pilot night operations, as the intent of the third-class medical (at least) or BasicMed requirement is not only for those considerations analyzed by a vision test. A vision test would address some of the concerns to verify a sport pilot is medically fit to conduct operations at night, but many other medical deficiencies or conditions previously identified would go unaddressed with just a vision test. This preamble previously contemplated and addressed the alleged cost and burden in section IV.H.1.j.iv.

Finally, FAA does not regulate based on concerns that a person would be deterred from obtaining night privileges because of concerns of being denied a medical certificate that could later affect BasicMed or other certification considerations. As discussed in the preceding sections, FAA finds some validation of medical fitness to be necessary given the safety risk to a pilot, passengers, and public and does not consider the medical qualification requirements in this rule to create an undue burden to address that risk.

viii. Comments Recommending FAA Remove § 61.329(d) Medical Eligibility Requirements Altogether for Sport Pilot Night Privileges

Approximately 63 commenters suggested FAA remove the medical eligibility requirement for sport pilot night privileges. Many of these commenters, including

AutoGyro Certification LTD, opined that training and a qualifying instructor endorsement requirement would be sufficient to validate that a sport pilot can operate safely at night without the need for an FAA medical. Some commenters stated the medical standards would not make night flying safer, whereas training and instructor endorsements would. For example, one individual commenter referenced a study that suggests pilots are not forthcoming on medical applications to support that training is more important than medical qualifications. While some commenters suggested specific training and endorsement parameters (e.g., 40 hours of night experience, increased night currency requirements), some, including USUA, recommended that proposed § 61.329(d) be eliminated from the final rule in its entirety.

Twenty-five commenters stated FAA failed to provide evidence or data to justify the medical qualifications set forth in proposed § 61.329(d).

As previously discussed, this final rule adopts certain training and endorsement requirements to address aeronautical proficiency when operating at night. However, training and endorsements alone are insufficient to determine if someone is physically fit to safely operate an aircraft at night. Flight instructors are not trained or qualified to provide medical assessments to validate that a pilot is medically fit to act as PIC. Designated medical examiners are trained and authorized to conduct FAA medical examinations focused on medical conditions specific to flight physiology, particularly those medical considerations applicable to night operations.

For the reasons discussed herein, in combination with the other requirements for sport pilots to be permitted to conduct night operations, including certain training, endorsement, and experience requirements, a sport pilot will be appropriately qualified to conduct night operations. These requirements are similar to the requirements a private

pilot must meet to operate at night time, set forth in § 61.109. FAA recognizes that the night medical qualifications for private pilots can equally serve sport pilots for the same night privileges and is appropriate to mitigate the risk associated with night operations, as previously addressed in this section. FAA finds this level of safety aligns with the safety continuum construct explained in the NPRM.

FAA asserts that concerns regarding misleading statements[126] on medical applications may be applicable to all pilots who apply for a medical certificate (or even a pilot certificate). The penalties for those individuals are significant, including leading to revocation of a pilot certificate. FAA's Office of Aerospace Medicine has a long history of identifying and evaluating medical conditions or deficiencies that create unacceptable risk to the public and the need to medically qualify pilots ensuring safe flight operations.

ix. Comments Suggesting an Alternate Process for those Previously Denied an FAA Medical Certificate or Have Never Obtained an FAA Medical Certificate

Five commenters suggested FAA permit sport pilots to operate even if they have been denied (thereby not meeting the BasicMed requirements set forth in § 61.23(c)), deferred, or never obtained an FAA medical certificate. One commenter suggested there should be a process for retaining sport pilot privileges if a medical certificate is denied or revoked.

This final rule does not adopt an alternate medical qualification process for those applicants who have been denied, deferred,[127] or never obtained an FAA medical certificate, as this would involve broad analysis of the medical certification framework not contemplated in the scope of this rule, which is tailored to light-sport category aircraft, operations, and sport pilot training and qualification. For the reasons discussed, FAA finds it necessary to require a person to either hold a medical certificate or, at

minimum, have held one in the past in accordance with the BasicMed provisions and finds those medical considerations to justify no alternate pathway for medical certificate denial or revocation at this time. FAA notes that, regardless of the medical requirements for a particular operation, all pilots are prohibited from acting as a required pilot flight crewmember during a medical deficiency, in accordance with § 61.53.

One commenter recommended that a person with a glider rating and a self-launch endorsement should be able to medically self-certify without a driver's license or any medical oversight from FAA to fly an aircraft with a gross weight of up to 1,874 pounds. FAA notes that neither a medical certificate nor a driver's license is required for daytime glider operations in accordance with §§ 61.303 and 61.23(b). This privilege existed under the previous rule and will be retained in the new rule. However, FAA notes that sport pilots who wish to exercise the newly introduced optional night privileges of § 61.329 in a glider must comply with the § 61.329(b) medical requirements to act as PIC at night. These night medical requirements are necessary to mitigate additional risk, as previously discussed, and apply equally to glider pilots.

x. Comments Regarding Alternate Medical Personnel to Qualify Sport Pilots

One commenter recommended FAA permit a state-licensed physician using current FAA medical requirements to determine eligibility for third-class medical certificates including for sport pilots. The commenter reasoned that a personal physician is more familiar with a person's medical conditions compared to accomplishing a physical with an aviation medical examiner (AME). Another commenter stated only a small percentage of the standards for a third-class medical certificate relate to the ability to fly at night, which can be adequately evaluated by any licensed healthcare provider.

Section 67.4 outlines the requirements for obtaining a first-, second-, and third-class medical certificate in which the exam must be performed by an AME designee who was designated in accordance with part 183. AMEs receive specific initial and recurrent training in aviation medicine to include medical conditions and treatments incompatible with aviation safety and possible mitigation of those conditions. In addition, AMEs receive ongoing mentoring by FAA Office of Aerospace Medicine as well as mandatory recurrent aerospace medical education. Under adopted § 61.329(b), a person will have received at least one examination by an AME who is specifically trained to ensure medical fitness pertaining to aviation operations, due to the requirement to either currently hold or previously have held an FAA medical certificate (i.e., for BasicMed compliance).

FAA did not consider changes to permit state-licensed physicians to conduct evaluations for FAA medical qualification purposes, as state-licensed physicians may not have this additional aviation focused training, and such a change would involve broad analysis of the medical certification framework not contemplated in the scope of this rule. However, in accordance with § 68.7, an airman may use a state-licensed physician to conduct a BasicMed medical evaluation using the comprehensive medical examination checklist for an airman to operate an aircraft without an FAA medical.

k. Airplanes With a Controllable Pitch Propeller or Aircraft With a Retractable Landing Gear

Currently, the § 1.1 definition of light-sport aircraft requires an aircraft to have a fixed or ground adjustable propeller if the aircraft is a powered aircraft other than a powered glider; powered gliders must have a fixed or feathering propeller system. Relatedly, the current definition requires a light-sport aircraft to have fixed landing gear,

except for aircraft intended for operating on water or a glider. The NPRM proposed to permit sport pilots to operate airplanes with a controllable pitch propeller or an aircraft with fixed or retractable landing gear (or with floats for aircraft intended for operation on water) if that person accomplishes additional ground and flight training and obtains the qualifying instructor endorsement, set forth in proposed § 61.331.

As it pertains to controllable pitch propellers, the NPRM explained the intent of the proposal was to permit sport pilots to operate airplanes equipped with either an automated or manual controllable pitch propeller,[128] but require sport pilots choosing to operate airplanes equipped with manually controlled propellers to complete additional training and receive an instructor endorsement to mitigate the increased risks associated with operator errors affecting safety. FAA subsequently identified a drafting error in § 61.315(c)(20)(ii). As proposed, that section provided that the training in § 61.331(b) would apply to sport pilots operating aircraft with a controllable pitch propeller. However, the language in § 61.331(b) applies only to airplanes with a controllable pitch propeller. To resolve this inconsistency and effectuate the NPRM intent, FAA modified § 61.315(c)(20)(ii) to state that it applies to airplanes only.

In addition, FAA recognizes that proposed § 61.315(c)(20)(ii) could inadvertently capture airplanes with automated propellers, particularly in tandem with new § 61.316(a)(4), (a)(5), and (b). Specifically, proposed § 61.316(a)(4) set forth the limitation and design requirements for the aircraft a sport pilot may operate pertaining to propellers, stating that for powered aircraft other than powered-gliders, a sport pilot could operate an aircraft with fixed or ground-adjustable propeller, except as provided in § 61.316(b). Section 61.316(b), in pertinent part, proposed additional training requirements (set forth in proposed § 61.331) for those airplanes with controllable pitch

propellers. Read together, the proposal could have inadvertently limited sport pilots from operating aircraft with automated propellers by specifying, "fixed or ground-adjustable," in § 61.316(a)(4), even though the NPRM explained FAA's intent to permit operations in those aircraft with automated propellers. In addition, § 61.316(a)(5) proposed to limit powered gliders to either a fixed or feathered propeller system. As previously stated, the NPRM explained FAA's intent to remove powerplant limitations from the performance limitations and design requirements for sport pilot operations.

FAA continues to find the overall design of these propeller systems is such that they are relatively simple to operate and would enable pilots to take advantage of the improved climb performance associated with that propeller system designed to avoid and clear obstacles during the climb and departure phase of a flight. Similarly, FAA finds aircraft with an automated controllable-pitch propeller would enable pilots to take advantage of the improved aerodynamic performance associated with these aircraft, as compared to fixed pitch propellers, without imposing additional workload.

Therefore, this final rule adopts revised regulatory text to capture both types of propellers, manually controlled and automated.[129] by modifying the proposed design limitation in § 61.316(a)(4) and renumbering to § 61.316(a)(9). That proposal would have limited powered aircraft other than gliders to a fixed or ground-adjustable propeller; in this final rule, there is no limitation on the propeller design of aircraft that sport pilots may operate, thereby permitting the use of any powerplant (subject to certain training restrictions subsequently discussed). Relatedly, FAA removed proposed § 61.316(a)(5) specific to powerplant limitations for powered gliders; therefore, this final rule will permit sport pilots to operate gliders with any powerplant design, including those equipped with propellers. To note, due to renumbering § 61.316(a)(4) and removing

(a)(5), this final rule renumbers the subparagraphs within § 61.316(a) (e.g., proposed § 61.316(a)(6) will become § 61.316(a)(4), proposed § 61.316(a)(7) will become § 61.316(a)(5), etc.). These revisions respond to various comments seeking additional clarification due to ambiguity in the proposal.

While sport pilots will be permitted to operate an airplane meeting the performance and design parameters in § 61.316 with the use of any powerplant, FAA continues to find it necessary to require additional training and an endorsement to act as pilot in command of an airplane with a manual controllable pitch propeller (as proposed in § 61.331(b)) due to the corresponding increased workload, attention, and adjustment by the pilot. Therefore, this final rule retains the proposed requirement for a sport pilot to obtain training and a flight instructor endorsement to operate airplanes with a controllable pitch propeller in §§ 61.315(c)(20)(ii) and 61.316(b) but specifies this training is only required for manual controllable pitch propellers. Section 61.331(b)(2) specifies that a sport pilot must receive additional flight training and receive an instructor endorsement to operate manually controlled propellers (§ 61.331(b)(1) provides an alternative to training and endorsement, which is subsequently discussed). The additional training and endorsement requirements for manual controllable pitch propellers will mitigate the additional risk and safety concerns, as opposed to the propeller pitch controls that are automated and do not correspond to the additional workload required to operate manual propellers. In addition, FAA added § 61.415(l), which requires a flight instructor to have received the training and endorsement in the manual controllable pitch propeller in an airplane or an aircraft with a retractable landing gear aircraft prior to providing flight instruction.

FAA proposed a similar framework for additional training for those aircraft with a retractable landing gear. Proposed § 61.315(c)(20)(i) stated a person with a sport pilot certificate may not act as PIC of an aircraft if the aircraft has retractable landing gear, unless the person has met the requirements of proposed § 61.331(a); this training requirement was reiterated in proposed § 61.316(b). Proposed § 61.331(a) set forth the training and endorsement requirements for operations with these design parameters. This final rule contains changes to that framework to correct two drafting errors that, if left unchanged, would create conflicting requirements between §§ 61.315 and 61.316 and between paragraphs (a) and (b) in § 61.316. Accordingly, FAA makes changes to § 61.316, along with conforming changes to § 61.315 to correct those errors. The final rule makes clear that sport pilot certificate requires operators of aircraft intended for operation on water with retractable landing gear to comply with training and endorsement requirements in § 61.331 unless the person logged pilot-in-command time in such an aircraft before [INSERT DATE XX DAYS AFTER FINAL RULE PUBLICATION].

The first drafting error is related to discrepancies between the language in proposed §§ 61.315 and 61.316. Proposed § 61.315(c)(20)(i) stated a person with a sport pilot certificate may not act as PIC of an aircraft if the aircraft has retractable landing gear, unless the person has met training and endorsement requirements in proposed § 61.331(a). Proposed § 61.316(b) also specified the training and endorsement requirement for airplanes that have retractable landing gear, but the language indicated that it applied to seaplanes with retractable landing gear, as opposed to all amphibious aircraft with retractable landing gear.

The second drafting error relates to discrepancies between § 61.316 paragraphs (a) and (b). In the NPRM, FAA proposed to allow sport pilot certificate

holders to operate gliders with fixed or retractable landing gear (proposed § 61.316(a)(9)) and aircraft intended for operation on water with fixed or retractable landing gear (proposed § 61.316(a)(10)). Again, FAA's proposed language in § 61.316(b) applied to airplanes with retractable landing gear to comply with training and endorsement requirements in § 61.331. Therefore, the proposal would have applied to airplanes intended for operation on water that have retractable landing gear. This directly conflicts with the language in § 61.316(a)(10) that proposed to allow sport pilots to operate aircraft intended for operation on water with retractable landing gear without training or an endorsement.

The history of the current requirements informs FAA's understanding of the discrepancy. In the original 2004 rule establishing light-sport aircraft, FAA defined gliders with retractable landing gear as light-sport aircraft,[130] which meant they fell within the scope of sport pilot privileges. In contrast, aircraft intended for operation on water with retractable landing gear did not fall within the light-sport aircraft definition. Therefore, pilots needed a regulatory exemption to operate aircraft intended for operation on water with retractable landing gear under sport pilot privileges. Aircraft intended for operation on water with retractable gear present additional complexities for safe landings compared to fixed hull aircraft. Accordingly, the exemption required training to mitigate the additional risk of permitting sport pilots to operate these types of aircraft.[131]

In 2007, FAA changed the definition of light-sport aircraft to include aircraft intended for operation on water with fixed or retractable landing gear.[132] That change eliminated the need for exemptions. However, FAA did not update the applicable regulations to require training. That meant FAA no longer required training as a condition

of exercising light-sport privileges in aircraft intended for operation on water with retractable landing gear.

Since then, sport pilots have been operating aircraft intended for operation on water with retractable landing gear without applicable training. FAA recognizes the need to mitigate the risk associated with the potential mishandling of retractable landing gear on an aircraft intended for operation on water, which has contributed to accidents in these aircraft[133]. As a result, FAA proposed § 61.316(b) to require sport pilots to complete training and obtain an endorsement to operate aircraft intended for operation on water with retractable landing gear. In addition, removing the weight limit on the types of aircraft sport pilots may operate will expand the variety of aircraft eligible for sport pilot operations. FAA anticipates this will include additional aircraft intended for operation on water with retractable landing gear, including amphibious seaplanes. FAA includes the training and endorsement requirements in this final rule to mitigate the demonstrated risk under current rules, as well as the risk associated with expanding the variety of aircraft intended for operation on water now available to sport pilots.

To correct the drafting errors and effectuate FAA's original intent in the NPRM, the final rule makes clear that sport pilot certificate holders must complete training and obtain an endorsement to operate aircraft intended for operation on water with retractable landing gear. The rule, as adopted, includes several changes to § 61.316 to resolve these problems. First, FAA removed proposed § 61.316(a)(10) so that it no longer creates a conflict with § 61.316(b), implementing FAA's original intent in the NPRM. Second, FAA removed the reference to aircraft intended for operation on water from the language in proposed § 61.316(a)(11) and re-numbered that paragraph to § 61.316(a)(8) so the provision applies to operation on water or land.[134] Third, FAA replaced the term

"airplane" in proposed § 61.316(b) with "aircraft" so that the adopted version now applies to all aircraft with retractable landing gear. FAA makes this change in response to a comment (summarized in subsequent paragraphs) and to take into account that aircraft intended for operation on water with retractable landing gear include other categories of aircraft. This also resolves the conflict between §§ 61.315(c)(20)(i) and 61.316(b). See section IV.H.1.k. for additional discussion of the change from "airplane" to "aircraft" in § 61.316(b). Together, these changes provide that aircraft intended for operation on water with retractable landing gear now fall within § 61.316(b), which includes the requirements for training and an endorsement.

Finally, FAA recognizes that sport pilots have been operating aircraft intended for operation on water with retractable landing gear since 2007 without training or an endorsement. In addition, some sport pilots operated these aircraft with training under exemptions between 2004 and 2007. Requiring sport pilots who have already been operating these aircraft to undergo training and obtain an endorsement would likely create an unnecessary burden. In some cases, the pilots may have been operating these aircraft for the past 20 years. In addition, many of the aircraft intended for operation on water with retractable landing gear are too heavy to have been operated as light-sport aircraft under FAA's previous rules. Accordingly, those pilots would have been required to hold private pilot licenses to operate them, which would have included a complex endorsement under § 61.31(e). To ease the burden on this population, the requirement for training and endorsement does not apply to pilots with experience operating aircraft intended for operation on water with retractable landing gear prior to [INSERT DATE 90 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER as specified in § 61.331(c).

FAA received approximately 29 comments specific to permitting the use of aircraft with an adjustable pitch propeller and retractable landing gear. Most of these commenters, including Van's Aircraft, AutoGyro Certification LTD, Hartzell Propeller, and GFTA, supported these expanded privileges. Commenters generally stated these design characteristics would constitute a safety enhancement through improvements in climb and cruise performance.

GFTA noted concerns with manually adjusted propellers as leading to misconfigured propellers and maintenance errors. Similarly, one commenter stated mechanical failures and pilot errors make retractable gear inherently more dangerous than fixed gear. FAA finds these safety concerns are mitigated through the retention of additional training and an endorsement validating proficiency by a qualified flight instructor. This training and validation of proficiency through an endorsement seeks to enable operations, while ensuring pilots are sufficiently trained on the risks of operations with adjustable pitch propellers and retractable landing gear and capable of taking corrective action with respect to these systems as necessary. FAA notes there are no prescriptive training hour requirements to retain flexibility and deference to an authorized instructor's expertise in determining when a person is sufficiently proficient in the aircraft operation, further reducing any barrier due to an overly prescriptive burden.

FAA received several comments about other operational privileges necessitating additional training and an endorsement. NAFI and some individual commenters recommended FAA create a table to clarify what a pilot must accomplish to obtain an endorsement to fly airplanes with controllable pitch propellers and retractable landing gear and requested clarification as to whether high-performance and complex endorsements are available and applicable to a sport pilot. Pilots must obtain training and

an instructor endorsement under § 61.31 to operate complex or high-performance airplanes, which is equally applicable to sport pilots. FAA finds the revisions previously discussed more clearly communicate training and endorsement requirements for adjustable pitch propellers and retractable landing gear and align with the current training and endorsement framework in part 61, rendering a table unnecessary at this time.

LAMA and USUA suggested modifying § 61.331(b) and substituting the word "airplane" with "aircraft" with respect to the use of manual controllable pitch propellers. USUA further stated a few modern gyroplanes have them and there may be a few newer weight-shift-control trikes that have controllable pitch propellers as well.

FAA is only expanding the use of manual controllable pitch propeller for airplanes because the intent is to only increase the scope of the airplane and its capabilities to be similar to what FAA currently requires in § 61.31 for pilots seeking to act as pilot-in-command of a complex airplane or a high-performance airplane in which additional training and an endorsement are received.

One commenter opined the proposal permits multiengine and retractable landing gear privileges and suggested providing clarification regarding the use of logbook endorsements to permit sport pilots to operate multiengine and retractable landing gear aircraft. A sport pilot cannot obtain multiengine privileges in the current, nor in the proposed or adopted, framework. Sections 61.311 and 61.313 only set forth flight proficiency and aeronautical experience requirements for single-engine land or sea privileges for the airplane category. FAA did not propose a sport pilot airplane multiengine privilege and maintains the status quo that a person seeking to operate a multiengine airplane will need to obtain a private pilot certificate or higher with an airplane multiengine rating.

One commenter recommended FAA expand sport pilot certificate endorsements under the driver's license medical requirement, including endorsements for retractable gear and adjustable pitch propeller use. In response, FAA notes that retractable landing gear and manual propeller pitch control privileges will be permitted by additional training and obtaining instructor endorsement requirements, not by the individual's medical eligibility. FAA does not find additional medical qualification requirements necessary for these endorsements.

One commenter stated possession of a private pilot certificate and a complex endorsement should permit a pilot to operate a constant speed propeller with no additional training. In addition, the commenter suggested allowing sport pilots to operate complex airplanes by satisfying the additional training and endorsement requirements in § 61.31(e). The commenter stated constant speed propellers and retractable landing gear are not difficult to manage, especially for aircraft that do not incorporate a propeller control, and an appropriately trained and endorsed sport pilot should be permitted to operate a complex aircraft. Relatedly, several commenters recommended a higher grade of pilot certificate, the appropriate experience, and complex airplane endorsements to be permitted to operate aircraft with an adjustable pitch propeller or retractable landing gear without additional training and endorsements.

FAA maintains the safety continuum concept supports the need for sport pilots to obtain additional training and endorsement to operate airplanes with a manual controllable pitch propeller or retractable landing gear because sport pilots without this additional training can misuse these systems. The potential mismanagement of retractable landing gear leads to additional risk of accidents. Similarly, mismanagement of a manual controllable pitch propeller can inadvertently damage an engine. As discussed in the

NPRM, FAA finds that requiring training in the operation of an airplane with a manual controllable pitch propeller or an aircraft with retractable landing gear would allow the sport pilot to become proficient with the use of these specific designs and capabilities before acting as PIC in the aircraft. This training and endorsement mitigates the additional risk.

As discussed in the NPRM, FAA noted manual controllable pitch propellers and retractable landing gear are features of complex airplanes as defined in § 61.1.[135] Pilots seeking to operate complex airplanes are required to obtain training and an endorsement under § 61.31(e). The commenter is correct that pilots who already hold a complex endorsement in accordance with § 61.31(e) are currently not, and will not be, required to obtain training and an endorsement to operate airplanes with manual controllable pitch propellers or retractable landing gear because the training to receive a complex endorsement provides the necessary knowledge and skills to operate aircraft with those systems. In addition, a sport pilot may receive training and an endorsement from an authorized instructor in accordance with that section to operate a complex airplane. Since training in complex airplanes includes instruction on the use of manual controllable pitch propellers and retractable landing gear, FAA proposed, and adopts herein, § 61.331(a)(1) and (b)(1), relieving a pilot with a complex airplane endorsement from the requirement to obtain an additional endorsement under § 61.331 when seeking to operate an airplane with manual controllable pitch propellers or retractable landing gear. In addition, as stated in the NPRM,[136] if the person has experience in an airplane with manual controllable pitch propellers or aircraft with retractable landing gear but does not have a complex endorsement to meet § 61.331(a)(1) or (b)(1), FAA will accept previous flight experience acquired in an airplane with a controllable pitch propeller or an aircraft with a

retractable landing gear obtained before or after this final rule publishes. The pilot time must be properly documented in the pilot's logbook or flight record and otherwise satisfies the experience requirements provided in § 61.331. However, the requirement to obtain a flight instructor endorsement validating proficiency is still applicable to account for any possible passage of time since the previous flight experience.

Some commenters raised concerns that permitting controllable pitch propellers and retractable landing gear may cause insurance premiums to increase. FAA cannot speculate nor does FAA regulate based on insurance company response.

Some commenters opposed expanding sport pilot privileges to operating airplanes with a retractable landing gear, except for gliders or for aircraft that can take off and land both on land and in water (sometimes colloquially referred to as amphibious aircraft), for various reasons. One commenter suggested FAA not expand sport pilot privileges to variable pitch propellers, unless it is a single-lever power control with no independent pilot control of pitch, but did not provide differentiation for consideration as to the handling characteristics.

As discussed, commenters are correct that this final rule permits sport pilots to operate all propellers (automated and manual) but requires pilots of airplanes with manual controllable pitch propellers and aircraft with a retractable landing gear to receive additional training and an instructor qualifying endorsement. FAA notes the final rule is not reducing the minimum flight experience requirements for a sport pilot certificate and will require the training and proficiency validating endorsement to facilitate the expansion of privileges in a safe manner. FAAs notes the expansion of operational privileges to aircraft with a retractable landing gear and a controllable pitch propeller after obtaining additional training and a qualifying flight instructor endorsement is not

novel. Since 2007, FAA has permitted sport pilots to operate seaplanes or gliders with a retractable landing gear and finds this privilege can extend to all category and class privileges available to sport pilots with additional training for the reasons explained in the NPRM and herein.[137]

Relatedly, two commenters stated it is illogical to require a controllable pitch propeller endorsement for a fixed-pitch propeller aircraft if that aircraft has previously equipped with a controllable pitch propeller. FAA explains the training and qualifying flight instructor endorsement required to operate an airplane with an adjustable pitch propeller is only applicable if the existing configuration of the aircraft a sport pilot intends to operate has an adjustable pitch propeller.

2. Model-Specific Endorsement for Aircraft Certificated with a Simplified Flight Controls Designation (§§ 61.9, 61.31, 61.415, and 61.429)

FAA proposed to establish (and adopts in this final rule) a simplified flight controls designation in § 22.180 (i.e., aircraft without primary flight controls available to the pilot). Because FAA does not currently have a regulatory mechanism to facilitate training and a proficiency validation, and FAA anticipates varying simplified flight controls designs from aircraft to aircraft,[138] the NPRM proposed to require all pilots operating aircraft designed and certificated with simplified flight controls to obtain make and model specific training and an instructor endorsement validating competency in that unique design. In addition, FAA proposed that applicants seeking an initial category and class rating or privilege in an aircraft with simplified flight controls must successfully pass a practical test. FAA received comments on this framework, as discussed in the following section, but adopts the framework as proposed and explained herein.

Therefore, new § 61.31(l) will contain the qualification requirements for persons seeking to act as PIC of an aircraft with a simplified flight controls designation. Specifically, a pilot will be required to obtain model-specific training in paragraph (l)(1) and a logbook endorsement from an authorized instructor in (l)(2)). FAA notes there are no prescriptive training hour requirements to retain flexibility and deference to an authorized instructor's expertise in determining when a person is sufficiently proficient in the aircraft operation, further reducing any barrier due to an overly prescriptive burden.

The authorized instructor may be a subpart H instructor or a subpart K sport pilot instructor but, regardless of the instructor's qualifications, the instructor will be required to first receive the model-specific training and the accompanying endorsement to validate that the instructor is proficient in the operation of the aircraft. This final rule will add new § 61.415(m) to expressly limit a subpart K sport pilot instructor from providing training in an aircraft with simplified flight controls designation unless the sport pilot instructor has received the model-specific training and endorsement required under proposed § 61.31(l) from an authorized instructor. Similarly, the addition of § 61.429(d) will expressly limit a subpart K instructor seeking to exercise the privileges of their flight instructor certificate in a model-specific aircraft that has a simplified flight controls designation from providing training in an aircraft with simplified flight controls designation unless the person has received the training and endorsement requirements specified in proposed § 61.31(l).

As discussed in the NPRM, FAA recognized that because this is a new training requirement, no pilot will have received the training or endorsement necessary to act as PIC. FAA expects the first cadre of instructors will be qualified by instructor pilots employed by manufacturers of aircraft with simplified flight controls, and the availability

of authorized instructors will expand accordingly. FAA did not receive any feedback expressing concern with the availability of instructors during the comment period and maintains this framework will not create an access barrier for pilots or prospective pilots. New § 61.195(n) (which was proposed as paragraph (m)) will permit instructor pilots who are employed or used by a manufacturer of aircraft with the simplified flight controls designation to provide training and endorsements to the initial cadre of authorized instructors and pilot examiners.[139] FAA notes that only subpart H instructors with the appropriate category and class will be permitted to receive training from these manufacturer instructor pilots to establish the initial cadre of § 61.31(l) authorized instructors (i.e., other subpart H instructors and subpart K flight instructors). The training requirements largely mirror those set forth in § 61.31(l): have received and logged model specific training in that aircraft from an instructor pilot for the manufacturer of the aircraft and receive an endorsement validating proficiency. In sum, the manufacturer instructor pilots may train subpart H flight instructors (§ 61.195(n)); subpart H flight instructors may train other subpart H flight instructors and subpart K flight instructors (§ 61.415(n)); and subpart K flight instructors can train other subpart K flight instructors, sport pilots, and sport pilot applicants (§ 61.31(l)).

Aeronautical experience obtained in an aircraft with simplified flight controls is not equal to the aeronautical experience obtained in aircraft with conventional controls.[140] For example, a person seeking a commercial pilot certificate with a rotorcraft category helicopter class rating should not be able to use pilot time acquired in a helicopter with simplified flight control designation to meet the PIC flight time experience requirement in § 61.129(c)(2)(i), which requires 35 hours of PIC flight time in a helicopter due to the differing operational characteristics between the flight controls. To restrict the possibility

and safety risk of a pilot building time in a more simplistic aircraft with simplified flight controls and then seeking a higher certificate or rating in an aircraft with conventional flight controls, FAA proposed, and this final rule adopts, new § 61.9. FAA finds this safety mitigation necessary to account for the vast differences in the handling characteristics of the designs and breadth of aircraft generally available to a pilot after receiving a class rating.

Therefore, pilot time acquired while operating an airplane or helicopter with a simplified flight controls designation will not be permitted to satisfy certain time for a private, commercial, or airline transport pilot, except for private pilot applicants who present an aircraft with the simplified flight controls designation to conduct the practical test. This exception will not be permitted at higher-grade certificates because higher-grade pilot certificates require greater aeronautical knowledge, skills, experience, and afford greater operational privileges, which include carrying passengers for compensation or hire, higher on the safety continuum (i.e., necessitating greater risk mitigation). Experience gained by piloting an aircraft with simplified flight controls is not equal to the experience necessary for traditional control operations due to the reliance on significant automation. After FAA obtains more experience and data concerning the use of these aircraft with simplified flight controls, FAA may consider additional pilot time credit for experience in aircraft with simplified flight controls in future rulemaking.

ALPA and Reliable Robotics Corporation generally supported FAA's proposal to require training and endorsements for pilots and flight instructors seeking to act as PIC of aircraft certificated with a simplified flight controls designation. ALPA also supported requirements for standardized training programs that issue type ratings or category and class ratings upon successful completion of a training course largely comprised of flying

the actual aircraft in the NAS and practical tests ensuring competence by the Airman Certification Standards (ACS); however, ALPA expressed concern that performance-based standards for pilot qualifications will increase risk and reduce safety, including related to human factors. ALPA suggested that minimum hourly training requirements, instructor endorsements on pilot proficiency, and the pilot demonstration of competency will create a safe, competent, and proficient system. ALPA also suggested that requiring only a logbook endorsement for authorizations is insufficient and puts responsibility on instructors instead of FAA.

FAA acknowledges ALPA's concerns but asserts the principles of its suggestions are already present in the mandatory training, certification, and instructor endorsement regulatory framework and is not persuaded to change the use of endorsements by authorized instructors as a proficiency validation. First, the pilot will already hold a pilot certificate with the appropriate category and class ratings, validating the aircraft category and class fundamental and foundational level of knowledge, skill and proficiency when they successfully complete a practical test in accordance with the applicable ACS or PTS. In the case of someone seeking an initial certificate with a new category and class rating in an aircraft with simplified flight controls, the person will be required, similarly, to successfully complete a practical test in accordance with the applicable ACS or PTS, which is discussed in section IV.H.2 of this preamble. Authorized instructors are trained and qualified to evaluate pilots and validate proficiency for privileges that are within that category and class of aircraft. Flight instructors have a long history of ensuring pilot competency when providing flight training, recommendations for testing, and validating pilot proficiency for various aircraft authorizations that fall within the associated category and class ratings.[141]

Pivotal.aero recommended requiring a simplified flight controls system-specific endorsement, based on the design of the simplified flight controls system, rather than based on the make and model of the aircraft. Pivotal.aero stated this alternate endorsement requirement would allow a manufacturer or a consensus standard to define a version of a simplified flight controls system, permitting system-specific endorsements to apply to multiple makes and models.

FAA disagrees with a simplified flight controls "system specific" endorsement because the aircraft manufacturing industry has not yet produced a standardized simplified flight controls system design recognized or accepted by FAA; therefore, FAA has little data to evaluate such a flight training efficiency that may present a safety risk or otherwise validate that a system performs identically in each aircraft. Specifically, standardized simplified flight controls may have unique operating characteristics for each make and model of aircraft; in other words, the same system may be installed on two aircraft, but the drastically differing operating and handling characteristics of the two aircraft may inherently modify the system once installed, necessitating additional training. Until simplified flight controls standardization has come to maturity and meets a recognized standard for aircraft certification, FAA maintains that it is necessary to utilize a specific make and model training and instructor endorsement qualification to ensure a pilot is competent and proficient with the use of each make and model aircraft with a simplified flight control system.

USUA contended the proposed simplified flight controls training and endorsement is overly prescriptive, stating some aircraft equipped with certain simplified flight controls may not need specific training with an authorized instructor endorsement. USUA stated the proposal makes it more difficult for pilots and potential pilots to access

qualified flight instructors using aircraft equipped with simplified flight controls and takes the failed approach of the original 2004 rule that mandated make and model endorsements for each model of light sport aircraft that a sport pilot wanted to fly. USUA recommended creating an "aircraft with Simplified Controls" rating and the manufacturer would stipulate whether the aircraft needs specific make-model training.[142]

Safari Helicopter also opposed a simplified flight controls designation and the associated training requirements, specifically for helicopters sport pilots can operate, and asserted that helicopters with conventional controls are easy to operate and understand. Safari Helicopter stated, if FAA's proposal is to encourage fly-by-wire systems in helicopters, this proposal will add a layer of complexity rather than simplifying. It further explained that pilots acclimated to operating helicopters that can "almost" fly themselves will become reliant on simplified flight controls systems. Many of Safari Helicopter's other comments were not specific to simplified flight controls and instead discussed the use of traditional flight controls, drones, financial concerns, and flight training considerations.

FAA notes the novelty of aircraft with simplified flight controls and general lack of data and empirical evidence to substantiate widespread operational necessity. Consequently, this rulemaking intends to take a measured approach to integrating these aircraft into the NAS. While conservative in requiring defined training and instructor endorsements for each aircraft make and model, this is a first step of integration as it pertains to pilot training and certification. Until there is clear, safety-based operational data for simplified flight controls evidencing opportunity for relaxed standards in the NAS, FAA finds the make and model specific endorsement approach will satisfactorily ensure the pilot is proficient in the operation of each unique simplified flight controls

system installed in a given make and model of aircraft. Helicopters with conventional flight controls are significantly more demanding than operating those with simplified flight controls. For example, a pilot must provide continuous flight control inputs using the cyclic stick, collective lever, and antitorque pedals to maintain control and stability compared to the operation of a helicopter with simplified flight controls. This preamble further discusses simplified flight controls considerations specific to helicopters in section IV.H.2.

USUA is correct that the 2004 rulemaking did prescribe a make and model endorsement requirement for aircraft that a sport pilot can operate; FAA removed that requirement in 2010 after industry and aircraft further developed, leading to recognition of design and operation similarity of each category and class aircraft.[143] However, since simplified flight control systems do not have a standard design, which may vary from one category and class to another, FAA determined that make and model specific training and instructor endorsements are necessary to validate pilot proficiency to ensure safe flight operations. This rulemaking does not foreclose FAA from similar standardization and streamlining to account for operational similarities at a later time, much like the 2010 rule, once industry and FAA garner more information and data available on simplified flight controls.

Further, this final rule does not implement a simplified flight controls "rating." The training and endorsement model aligns with other specialty characteristics of aircraft already integrated within part 61; for example, operation of a high-performance airplane and a complex airplane both require training and an endorsement.[144] FAA finds no compelling reason at this time to introduce further complexity in treating aircraft designed and designated with simplified flight controls differently from the framework

already integrated into § 61.31 by creating a brand new rating that was not proposed in the NPRM.

Finally, this final rule is not necessarily intended to encourage use of fly-by-wire systems; this rulemaking is intended to leverage training and an instructor endorsement to integrate aircraft (including helicopters) that have a simplified flight controls system design that allows the use of a simple to operate flight control system, compared to conventional flight controls, into the NAS. In response to Safari Helicopter's concern that pilots will become reliant on simplified flight controls, this concern is the reason training and an instructor endorsement will be required for each make and model aircraft to validate proficiency. In addition, as discussed in section IV.H.4 of this preamble, if a pilot seeks to operate an aircraft with conventional flight controls, that person will be required to accomplish a practical test in that category and class of aircraft equipped with conventional flight controls.[145]

AUVSI commented on the inapplicability of simplified flight controls aircraft experience credit beyond the private pilot certificate level under new § 61.9. AUVSI stated training in aircraft with significant supporting autonomy may not be applicable to ratings in aircraft with conventional flight controls but questioned the general private pilot credit limitation. AUVSI suggested systems thinking, airspace integration, decision-making, and other relevant experience should continue to accumulate past the private pilot level in both aircraft with simplified flight controls, and in aircraft with conventional controls, or both.

Reliable Robotics also recommended FAA continue collaboration with stakeholders on competency-based training programs to identify pathways for applying credit hours when operating aircraft with simplified flight controls under part 61

requirements for higher-grade pilot certificates. FAA will continue to collaborate with stakeholders concerning training, credit, and use of aircraft with simplified flight controls as industry develops these aircraft.

AIR VEV supported FAA's proposal to limit credit toward the operational experience requirements for higher grades of pilot certificates, citing the reduced level of pilot input for direct aircraft trajectory control. However, AIR VEV recommended amending the language under § 61.9 to expand the limitation applicability to all aircraft, rather than only airplanes and helicopters, and further specifying the systems as "highly automated."

FAA contends the rule text, as proposed and now adopted, appropriately limits simplified flight controls pilot time experience credit to account for the anticipated differences in knowledge and skills required to operate aircraft with simplified flight control designs. The unique character of each make and model is expected to result in significant differences in pilot skills required for their operation. Consequently, PIC flight time gained in an aircraft with simplified flight controls is inapplicable for use in satisfying aeronautical experience requirements from higher grades of pilot certificates with traditional flight controls. This mitigation is necessary because PIC experience gained in an aircraft with simplified flight controls may not provide the equivalent knowledge and skills expected for those higher grades of certificates.

In addition, FAA intentionally limited the application of § 61.9 in the NPRM by using the terms "airplanes and helicopters" instead of "aircraft." This is because FAA does not have sufficient information on which to base a decision on how aeronautical experience in other categories of aircraft with simplified flight controls would apply to aircraft with conventional flight controls. Accordingly, at this time, it is not appropriate to

expand § 61.9 to apply to aircraft other than airplanes and helicopters. Therefore, FAA will retain specific references to airplane and helicopter categories in the § 61.9 final rule text. The recommendation to revise § 61.9 to refer to "highly automated" systems is also unnecessary, as this automation is already inherent in the simplified flight controls designation.

3. Conducting Practical Tests in an Aircraft Certificated with a Simplified Flight Controls Designation (§ 61.45)

As previously noted, in some instances, a pilot may only need to complete training and the endorsement to operate an aircraft with simplified flight controls and, in other instances, a pilot may need to complete a practical test. FAA proposed § 61.45(h) to set forth the general framework to determine which proficiency event is required, which is adopted in this final rule. Under § 61.45(h)(1), if a person has a category and class rating or privilege with a simplified flight controls limitation and seeks to operate another make and model of aircraft with a simplified flight controls designation in the same category and class, the person will be required to receive training and an endorsement in accordance with § 61.31(l). As discussed in the NPRM,[146] FAA maintains that training and an endorsement is sufficient due to the similarities within category and classes of aircraft. Under § 61.45(h)(2), if a person has a category and class rating or privilege with a make and model simplified flight controls limitation and seeks to operate either (1) a different category and class of aircraft with a simplified flight controls designation as an initial applicant for that category and class rating[147] or (2) any aircraft without a simplified flight controls designation, the person will be required to successfully complete a practical test for that category and class of aircraft, except as provided in § 61.321(a), as subsequently discussed in section IV.H.6. FAA maintains the design and

handling characteristics between different categories and classes and between simplified flight controls and conventional controls, and considering the operational profile for higher grades of certificates than sport pilots, is significant enough to warrant a practical test to ensure pilot proficiency. FAA proposed additions in § 61.45 via new paragraph (g) to address the wide variance of simplified flight control designs and characteristics and ensure the safety of pilots and examiners in these novel aircraft. The additional mitigations in paragraph (g) are adopted in this final rule. Specifically, paragraphs (g)(1), (2), and (3) will require the examiner to: agree to conduct the test; hold the appropriate simplified flight controls model-specific aircraft endorsement and an appropriate FAA designation to conduct the test; and be able to assume control of the aircraft at any time.[148] After successfully completing the practical test, the pilot will receive a simplified flight controls make and model limitation under new § 61.45(g)(4) and (h).

In those circumstances where a pilot must take a practical test, FAA recognized in the NPRM that certain aircraft may be incapable of accomplishing all the tasks required during the conduct of a practical test. Traditionally, § 61.45(b)(2) accounts for these operational limitations by permitting an applicant to use the aircraft with the operating limitations for the practical test by issuing the person's pilot certificate with corresponding limitations. This final rule does not make changes to § 61.45(b)(2).

In the NPRM, FAA stated it would develop guidance to address aircraft that are not capable of performing all the required tasks in the ACS. In lieu of developing guidance, FAA made changes to paragraph (g) to address this issue. Therefore, § 61.45(b)(2) and (g) serve a similar purpose: limiting the pilot from operating aircraft that may be able to perform tasks and maneuvers that the pilot has not received training or satisfactorily demonstrated during a practical test or proficiency check. FAA proposed

paragraph (g) to address the limitations related to aircraft with simplified flight controls. Anyone who uses an aircraft with a simplified flight controls designation for a practical test or proficiency check, irrespective of whether they hold a higher-level pilot certificate, may only operate the specific simplified flight control make and model used for the test. Pilots who hold a higher certificate will receive a make-and model-specific limitation on the person's pilot certificate under new § 61.45(g)(4)(i). Sport pilots will receive a logbook endorsement specific to that make and model aircraft under new § 61.45(g)(4)(ii). As a result of the make and model limitation, it is no longer necessary for FAA to develop guidance for aircraft that are not capable of performing all required tasks in the ACS.

Subpart H flight instructors fill a critical role in the NAS because they train pilots toward higher grades of pilot certificates, including commercial and airline transport pilot certificates, and the pilots they train may go on to serve in passenger-carrying operations for compensation. When reviewing proposed § 61.195 pertaining to the limitations for flight instructor applicants who accomplish a practical test in an aircraft with simplified flight controls, FAA recognized the need to ensure a flight instructor is thoroughly qualified to provide effective flight instruction in a conventional aircraft prior to instructing in a simplified flight controls aircraft. Therefore, FAA is amending § 61.195(m) to require flight instructors (subpart H) take their initial flight instructor practical test in an aircraft with conventional controls and then may instruct in an aircraft with simplified flight controls if the instructor has the make and model endorsement in accordance with § 61.31(l).

Conversely, subpart K flight instructors with a sport pilot rating may only provide training towards a sport pilot certificate. For example, an applicant seeking a subpart K

flight instructor certificate with a sport pilot rating with rotorcraft-helicopter privileges may accomplish a practical test for an initial flight instructor certificate in a simplified flight controls aircraft, as that is the only helicopter privilege for sport pilots. That pilot will receive a make and model endorsement in their logbook for their flight instructor certificate.[149]

GAMA suggested the new § 61.45(g)(2) is more restrictive than what is currently required for practical tests and not aligned with FAA policy addressing practical tests in single-control or single-place aircraft. GAMA recommended FAA allow a Designated Pilot Examiner (DPE) to make the decision on whether they are willing to conduct a practical test in an aircraft with simplified flight controls without the specific training and make and model endorsement. GAMA justified this recommendation based on the allowance provided in § 61.45(e)(1) and (2) concerning a single control or single seat aircraft. GAMA further opined that it seems contradictory to require the most experienced instructor pilots to obtain the training and endorsement specific to aircraft with simplified flight controls but not allow the least experienced pilots to apply aeronautical experience obtained in an aircraft with simplified flight controls toward a higher grade of pilot certificate.

Operations conducted in single control or single seat aircraft are not an appropriate comparison to and fail to take into consideration the unique operation of aircraft with simplified flight controls. The requirement in § 61.45(g)(2), which will require the examiner to hold the appropriate category and class rating (or privilege), the simplified flight controls model-specific aircraft endorsement, and an appropriate FAA designation, aligns with the expectation that examiners must be appropriately rated and qualified to conduct practical tests to determine applicant proficiency on a practical test.

Conversely, a single control or single seat aircraft renders an examiner largely unable to access controls during a practical test, which is a different safety consideration than a practical test with simplified flight controls. As described in the NPRM, manufacturers do not have standardized design standards for simplified flight controls that might be installed in their aircraft. Consequently, it is critical to require make and model specific training for both flight instructors and examiners operating aircraft with simplified flight controls, as unique knowledge and skills are necessary to operate each specific make and model of aircraft with simplified flight controls and to avoid the risk of improper procedures associated with training and testing, possibly resulting in accidents.

In response to GAMA's discussion about training and experience requirements, FAA disagrees that it is contradictory to require experienced instructor pilots to obtain make and model specific training and endorsements in aircraft with simplified flight controls, or to deny less experienced pilots to use aeronautical experience obtained in an aircraft with simplified flight controls towards higher grades of pilot certificate. Experience acquired in an aircraft with simplified flight controls is not equivalent to the experience requirements obtained in an aircraft with conventional controls when seeking private, commercial, or airline transport pilot certificate ratings and privileges, as previously discussed.

USUA suggested there is a shortage of sport pilot examiners and mandating model-specific endorsements would be too prescriptive, unnecessary, and would discourage student pilots from seeking to accomplish a practical test in aircraft with simplified flight controls. USUA recommended FAA remove the requirement for simplified flight controls model-specific aircraft endorsement from § 61.45(g)(2) and only require a category and class rating or privileges (and an appropriate FAA

designation to conduct the test). FAA understands the concerns about initial availability of simplified flight control pilot examiners; however, existing flight examiners with the appropriate category and class privilege can obtain the additional simplified flight controls training and endorsement to otherwise qualify to conduct a practical test in an aircraft equipped with simplified flight controls and FAA does not find this safety mitigation (i.e., ensuring examiners are sufficiently familiar with the controls system such that they can evaluate proficiency or intervene in an emergency) to overcome concerns of designee availability.

ALPA supported the § 61.45(b)(2) completion of a practical test in an aircraft with simplified flight controls resulting in a make and model limitation. However, ALPA opposed utilizing a single set of flight controls in aircraft used for flight training or testing, suggesting a single set of controls would prevent the instructor from immediately intervening in flight, leading to a possible unsafe flight condition. As a condition to facilitating use of a simplified flight controls model-specific aircraft test, § 61.45(g)(3) requires an examiner must be able to assume control of the aircraft at any time, which functions to mitigate risk associated with the conduct of a practical test in an aircraft with simplified flight controls. This rulemaking did not propose changes to the existing § 61.45(e) allowance for a practical test to be conducted in an aircraft having a single set of controls, which gives an examiner discretion to conduct a test in an aircraft with a single set of controls. This examiner discretion would extend to practical tests in an aircraft with simplified flight control designations.

FAA provided a table of various training and qualification scenarios in the NPRM[150]; however, since that time, FAA has assembled a number of additional scenarios

to serve as instructional. The comprehensive table, Airmen Certification Simplified Flight Controls Requirements, is in the docket for this final rule.

4. New Rotorcraft-Helicopter Privilege for Sport Pilots and Sport Pilot Instructors

Currently, sport pilots and flight instructors with a sport pilot rating are restricted from obtaining rotorcraft-helicopter (helicopter) privileges because the light sport aircraft definition excludes helicopters in § 1.1. As discussed in the NPRM in the pilot section and the discussion of proposed § 22.180,[151] FAA proposed to facilitate simple-to-fly helicopter designs as light sport category aircraft and, correspondingly, a new helicopter privilege for sport pilots to fly those helicopters that have been certificated with a simplified flight controls designation during aircraft certification. FAA received a number of comments on the proposed expansion of privileges to helicopter operations,[152] but adopts the proposed framework without substantive revisions, as explained herein. In sum, this final rule adopts revisions to several standing regulations, first, to expand sport pilot privileges to helicopters certificated with a simplified flight controls designation (§§ 61.311, 61.313, and 61.316) and, second, to facilitate sport pilot instructors to obtain or add helicopter privileges to their instructor privileges (§§ 61.409 and 61.411).

First, § 61.316(a)(6) will limit sport pilots to operate only helicopters certificated with a simplified flight controls designation, keeping with the intent of the 2004 final rule and this rulemaking's objective to facilitate the operation of simple-to-fly aircraft. FAA notes this was proposed as § 61.316(a)(8) (inadvertently referred to in the preamble as paragraph (a)(9)) and is adopted as paragraph (a)(6) due to the removal of proposed paragraphs (a)(4) and (5). In turn, this final rule adds "helicopter" in the list of aircraft in the introductory text of § 61.311, which prescribes the flight proficiency requirements to apply for a sport pilot certificate. To account for helicopter-specific areas necessary to

attain competency in the aircraft operation (in addition to existing areas of operation and tasks applicable to helicopters), this final rule modifies the listed areas of operations within § 61.311 to include ground and flight training on heliport operations in § 61.311(c) and hovering maneuvers in § 61.311(d).[153] These areas of operation are correspondingly reflected in the Sport Pilot Helicopter ACS.

Second, the NPRM proposed in § 61.313(a)(9) that an applicant for a sport pilot certificate who seeks to obtain a rotorcraft category and helicopter class privilege would be required to log at least 30 hours of helicopter flight time, including at least 15 hours of flight training, 5 hours of which must be solo flight training in the areas of operation listed in § 61.311. Proposed § 61.313(a)(9)(i) through (iv) further delineated flight training requirements (e.g., minimum solo training, takeoffs and landings, etc.). FAA explained in the NPRM that these minimum experience requirements aligned with the minimum requirements for a recreational pilot certificate for rotorcraft category and helicopter class rating. During the pendency of the rulemaking and while evaluating the general recreational pilot comments (further discussed in section IV.H.8.e. of this preamble), FAA found it necessary to specifically include cross-country training for the sport pilot rotorcraft category and helicopter class privilege training requirements. A certificated recreational pilot is limited to conducting flights within a certain distance (i.e., 50 nautical miles)[154]; therefore, the lack of cross-country training does not present a safety risk, as there is no operational privilege correlating with the training. However, sport pilots are not limited in cross-country operations. As § 61.313(a)(9) was proposed, an applicant could receive their privilege and operate in the NAS conducting cross-country flights without ever receiving the training. As a result, FAA finds an amendment to § 61.313(a)(9) necessary to safely facilitate cross-country operations in a helicopter for

sport pilots, and that the intended training best corresponds with that for a rotorcraft category and gyroplane class privilege in § 61.313(a)(4). FAA emphasizes that, while these training requirements are changed in paragraph (a)(9)(i) through (iv), the adopted training footprint taken together results in a de minimis revision. The revisions are set forth in the following table:

Table 5. Revisions to § 61.313(a)(9) – (iv)

Proposed Section 61.313(a)(9)(i) – (iv)	Adopted Section 61.313(a)(9)(i) – (iv)	Adopted Training Delta
2 hours of flight training en route to an airport that is located more than 25 nautical miles from the airport where the applicant normally trains.	2 hours of cross-country flight training.	Flights must be in accordance with cross-country parameters set forth in the § 61.1 definition of cross-country for purposes of a sport pilot certificate.
3 takeoffs and landings at the airport located more than 25 nautical miles from the airport where the applicant normally trains	10 takeoffs and landings to a full stop (with each landing involving a flight in the traffic pattern) at an airport	Additional 7 landings, no requirement for airport distance.
3 hours of solo flying in the aircraft for the privilege sought, on the areas of operation listed in § 61.98 that apply to the aircraft category and class privilege sought	One solo cross-country flight of at least 50 nautical miles total distance, with a full-stop landing at a minimum of two points, and one segment of the flight consisting of a straight-line distance of at least 25 nautical miles between the takeoff and landing locations	Reduced flight training hourly requirement, additional cross-country nautical mile minimums and take off and landings.
3 hours of flight training with an authorized instructor on those areas of operation specified in § 61.311 in preparation for the practical test within the preceding 2 calendar months from the month of the test.	2 hours of flight training with an authorized instructor on those areas of operation specified in § 61.311 in preparation for the practical test within the preceding 2 calendar months from the month of the test	Reduced flight training in the preceding 2 calendar months by one hour.

These experience levels are commensurate to the experience levels required for sport pilot operational privileges for other categories and classes of aircraft set forth in § 61.313 and those operational regimes expected for rotorcraft category and helicopter class flights.[155]

Third, FAA is likewise adopting the proposed flight proficiency requirements to allow sport pilot instructors to obtain or add helicopter privileges to their flight instructor certificate with a sport pilot rating, which will mirror those aeronautical experience requirements for instructional privileges in an airplane for those reasons discussed in the NPRM.[156] Much like the revisions to the areas of operation in § 61.311 and for the same reasons, this final rule will add helicopter specific areas of operation within § 61.409 to prescribe the ground and flight training areas of operation in § 61.409(e), (f), and (q) (i.e., heliport operations, hovering maneuvers, and special operations, all of which align with the Sport Pilot Flight Instructor Helicopter ACS, subsequently discussed in this preamble) and except helicopters from those inapplicable areas of operation in § 61.409(l) and (m).[157] New § 61.411(h)(1) will require an applicant for a flight instructor certificate with a sport pilot rating seeking a helicopter privilege (only available if that helicopter is certificated under § 21.190 and obtains the simplified flight controls designation) to complete at least 150 hours of flight time consisting of at least: 100 hours of flight time as PIC in powered aircraft, 50 hours of flight time in a helicopter, 25 hours of cross-country flight time, 10 hours of cross country flight time in a helicopter, and 15 hours of flight time as PIC in a helicopter.

VAI recommended that FAA consider a means for inclusion of conventional rotorcraft that can achieve the performance-based requirements established for "simplified control systems" through approved and installed advanced control

augmentation systems. VAI supported the new rotorcraft-helicopter privilege for sport pilots in addition to the proposed privileges for new rotorcraft with designed-in simplified control systems. VAI stated it recognized there are unique aeronautical skills necessary to operate any aircraft, including rotorcraft. To that end, VAI expressed concern the proposed rule unduly prevents sport pilots from operating rotorcraft with conventional flight controls. VAI (and one individual who cited the identical aeronautical experience requirements) referenced recreational pilots who can obtain a helicopter rating without simplified flight controls, contending that sport pilots could also be trained to safely operate light-sport category rotorcraft with conventional flight controls. Therefore, VAI recommended FAA include training requirements in the rule that would allow sport pilots to operate light-sport rotorcraft with conventional flight controls.

Likewise, AOPA, EAA, NATA, NBAA supported adding helicopter operating privileges to the sport pilot certificate but questioned restricting sport pilots to helicopters with simplified flight controls and aircraft holding a light-sport category special airworthiness certificate. They stated airmen can be safely trained to operate helicopters with conventional controls in an appropriately scaled sport pilot curriculum. They also describe that "simplified flight controls" only appear in the regulatory language in the context of what helicopters a sport pilot may operate. AOPA, EAA, NATA, and NBAA asserted helicopters do not merit this unique classification and suggested training and standards can be developed for helicopters with conventional controls, describing a history of existing curriculum and training standards for the recreational helicopter pilot certificate that do not require a "simplified flight controls" designation. They described that the only difference is that a recreational pilot must hold an FAA medical certificate or BasicMed, but a medical certificate does not add any more to the operation of a

helicopter than it would for any other class of aircraft (within the operational constraints of a sport pilot certificate). Several commenters, including Cicare USA, LLC, Vertical Aviation Technologies, Inc., and Orlando Helicopter Airways, Inc., also urged FAA to permit sport pilots to operate helicopters with conventional flight controls for various reasons including certification and operational expenses for helicopters equipped with simplified flight controls, history of conventional helicopters as simple and easy to fly, and limited availability of conventional helicopters at flight schools that sport pilots may operate. One commenter proposed that the requirement for simplified flight controls for helicopters should be removed because it is inconsistent with other categories of aircraft a sport pilot can operate, while another expressed concern about automated system failure. The commenter also suggested the certification of new helicopters with simplified flight controls will be delayed because that technology is still under development, but that ASTM standards for certification could be applied to existing helicopter technology development. Another commenter explained that a requirement for stability augmentation in lieu of a simplified flight controls requirement would be a more practical requirement for light-sport category aircraft.

Multiple individual commenters recommended FAA reconsider the requirement for simplified flight controls for helicopters for various reasons ranging from availability of simplified flight control aircraft, traditional helicopters being simpler and safer to operate, and simplified flight controls introducing additional points of failure with no mechanical backup. Four commenters suggested FAA should allow sport pilots to operate four-seat helicopters with conventional flight controls.

This final rule does not permit, nor did the NPRM propose to permit, sport pilots to operate helicopters with conventional flight controls; however, FAA does not find this

to be an undue restriction. As stated previously, the operation of helicopters with conventional flight controls is significantly more demanding to operate than any other sport pilot aircraft privilege. Conventional helicopters are more demanding to operate, requiring more skill in hovering, transitioning between forward flight and hovering, and navigating in confined spaces. In addition, helicopters often operate in more challenging and confined environments (e.g., hovering, low-altitude flight, areas with poor infrastructure, confined area operations, slope operations, rapid deceleration/quick stop, vortex ring state, and autorotations) and, often, more adverse weather conditions, increasing the risk of accidents. Thus, even with simplified flight controls, helicopters have greater risk associated with those types of flight operations. In addition, sport pilots with a helicopter privilege would have greater cross-country operational privileges than recreational pilots, who are limited to a radius of 50 nautical miles from the departure airport.[158] Because of the complex and operational nature of helicopters with standard flight controls and the recognition that loss of control is a concern with helicopter operations, FAA finds that helicopters a sport pilot can operate must have the simplified flight controls designation to fit in the easy-to-operate construct for sport pilot operations. If a person wishes to operate a rotorcraft helicopter with conventional flight controls, the person must seek a higher grade of pilot certificate with a rotorcraft-helicopter rating that ensures appropriate training and proficiency validation for such an operational regime. GAMA requested FAA to clarify the rationale for requiring 30 hours of flight time for sport pilots seeking a rotorcraft-helicopter simplified flight controls privilege. GAMA suggested the same should apply if FAA were to consider a sport pilot powered-lift privilege. Relatedly, one commenter recommended FAA offer the rotorcraft-helicopter

privilege for sport pilots with only a minimum of 20 hours of experience to incentivize pilot applicants to seek a rotorcraft-helicopter privilege at the sport pilot level.

The minimum flight time training requirements for sport pilots seeking a helicopter privilege is similar to the recreational pilot certificate for a helicopter rating because of the general risk associated with helicopter operations. However, as previously explained, FAA finds the recreational pilot certificate and sport pilot certificate to serve different purposes and operational profiles, therefore necessitating a varied sport pilot training regime within those 30 hours from that for a recreational pilot certificate.

5. Sport Pilot and Sport Pilot Flight Instructor for Rotorcraft-Helicopter; Incorporation by Reference

At the time of the MOSAIC NPRM publication, FAA was engaged in a separate rulemaking to incorporate all ACS and PTS, which contain the required tasks, criteria, and standards for successful completion of a practical test and proficiency check, into parts 61, 63, and 65. In 2024, FAA adopted the ACS IBR final rule, incorporating 30 pilot and flight instructor ACSs and PTSs in part 61 by reference through a centralized IBR section in new § 61.14;[159] directing compliance on the respective practical tests and proficiency checks with the appropriate ACS and PTS in §§ 61.43, 61.57, 61.58, 61.321, and 61.419, respectively; and adding an appendix to part 61 to set forth which ACS or PTS applies to a certificate or rating sought, or proficiency check.

As it pertains to sport pilots and flight instructors with a sport pilot rating, the ACS IBR rulemaking incorporated three sport pilot PTSs into part 61: (1) FAA-S-8081-29A, Sport Pilot and Sport Pilot Flight Instructor Rating Practical Test Standards for Airplane Category, Gyroplane Rotorcraft Category, and Glider Category, November 2023; (2) FAA-S-8081-30A, Sport Pilot and Sport Pilot Flight Instructor

Rating Practical Test Standards for Lighter-Than-Air Category, November 2023; and (3) FAA-S-8081-31A, Sport Pilot and Sport Pilot Flight Instructor Rating Practical Test Standards for Powered Parachute Category and Weight-Shift-Control Aircraft Category, November 2023.

After the publication of the ACS IBR NPRM, but before the ACS IBR final rule adoption, the MOSAIC NPRM proposed two new PTSs for sport pilots seeking a rotorcraft category, helicopter class privileges to account for the expanded operational privileges proposed in the MOSAIC NPRM: (1) FAA-S-ACS-26, Sport Pilot for Rotorcraft Category Helicopter—Simplified Flight Controls Airman Certification Standards, (Sport Pilot Helicopter ACS) and (2) FAA-S-ACS-31, Flight Instructor with a Sport Pilot Rating for Rotorcraft Helicopter—Simplified Flight Controls Privilege Airman Certification Standards, (Sport Flight Instructor Helicopter ACS). As explained in the ACS IBR NPRM, FAA is continuously working to convert all PTSs to ACSs in collaboration with the Aviation Rulemaking Advisory Committee (ARAC) ACS Working Group; therefore, FAA found it most appropriate to draft ACSs to facilitate certification for the helicopter privileges, as the remainder of the sport pilot PTSs will eventually be converted to ACSs. Because the ACS IBR rulemaking had not been finalized, the MOSAIC NPRM proposed directly incorporating by reference the two new ACSs into §§ 61.307(b) and 61.405(b) for practical tests, while recognizing the simultaneous ACS IBR rulemaking action and stating the rules would be reconciled, as appropriate.

As previously stated, the ACS IBR rulemaking adopted the centralized IBR section for all of part 61 in § 61.14. Therefore, rather than independently incorporating by reference the two ACSs into §§ 61.307 and 61.405 to tether the ACSs to the practical test,

as proposed, this final rule will add the two ACSs into § 61.14 and amend appendix A to part 61 to direct which ACS applies to the practical test for the certificate, rating, or privilege sought, aligning the overarching part 61 IBR framework. In other words, the proposals in §§ 61.307(b)(1) and (2) and 61.405(b)(3) and (4) will not be adopted in this final rule because the basic framework of § 61.14 and appendix A already accounts for the general requirement to conduct a practical test in accordance with the applicable ACS or PTS. Adding the two rotorcraft-helicopter ACSs to those provisions in this final rule will align with the existing framework, specifically new § 61.14(b)(13) and (17),[160] rendering the proposals in §§ 61.307(b)(1) and (2) and 61.405(3) and (4) duplicative. In addition, FAA will add two rows to the part 61, appendix A table to clearly delineate the applicability of each ACS.

In addition, the MOSAIC NPRM proposed to retain the proficiency check language in § 61.321(b) (adopted herein as §§ 61.321(a)(2)) and 61.419(b) that simply stated (in pertinent part) that a person had to complete a proficiency check in accordance with the applicable aeronautical knowledge areas in §§ 61.311 or 61.409 for the additional category and class privileges sought. After the publication of the MOSAIC NPRM, the ACS IBR final rule revised both §§ 61.321 and 61.419. Under current § 61.321, if a person holds a sport pilot certificate and seeks to operate an additional category or class of aircraft, the person (in pertinent part) must successfully complete a proficiency check consisting of the tasks in the appropriate areas of operation contained in the applicable incorporated by reference PTS, as listed in appendix A, for the additional light-sport aircraft privilege sought. Similarly, under current § 61.419(b), if a person holds a flight instructor certificate with a sport pilot rating and seeks to provide training in an additional category or class of aircraft, the person (in pertinent part) must

successfully complete a proficiency check consisting of the tasks in the appropriate areas of operation contained in the applicable incorporated by reference PTS, as listed in appendix A, for the additional category and class flight instructor privilege sought. From a practical perspective, these revisions adopted by the ACS IBR final rule did not include substantive changes to the tasks required to be conducted in the proficiency check to add additional sport pilot privileges; rather, the ACS IBR final rule legally and appropriately tethered the applicable PTSs. This MOSAIC final rule retains the current language of both § 61.321(b) (redesignated herein as §§ 61.321(a)(2)) and 61.419(b)[161] that was already published in the ACS IBR final rule (i.e., previously went out for notice and comment and FAA responded to comments in that preamble). Section IV.H.6. of this preamble further discusses the proposed exception language within adopted §§ 61.321(b) and 61.419(b).

In sum, the NPRM proposed to incorporate the two ACSs in §§ 61.307(b)(1) and (2) and 61.405(b)(3) and (b)(4); this final rule is relocating those ACSs to be incorporated by reference into § 61.14 and cross-referenced in appendix A to part 61. Each ACS establishes the aeronautical knowledge, risk management, and flight proficiency standards for sport pilot practical tests and flight instructor proficiency checks for light-sport category aircraft in the rotorcraft-helicopter class for sport pilots and for sport pilots with a flight instructor rating. The Sport Pilot Helicopter ACS contains the following areas of operation: preflight preparation; preflight procedures; airport and heliport operations; hovering maneuvers; takeoffs, landings, and go-arounds; performance maneuvers; navigation; emergency operations; and post-flight procedures. Similarly, the Sport Flight Instructor for Helicopter contains the following areas of operation: fundamentals of instructing; technical subject areas; preflight preparation;

preflight lesson on a maneuver to be performed in flight; preflight procedures; airport and heliport operations; hovering maneuvers; takeoffs, landings, and go-arounds; fundamentals of flight; performance maneuvers; emergency operations; special operations; and postflight procedures. Each ACS published with the NPRM, providing the public with notice of the contents and an opportunity to comment. FAA did not receive any comments on the content of the two proposed ACS drafts but made a number of editorial changes during the pendency of the rulemaking to conform with the already adopted ACSs and PTSs (i.e., as an outgrowth of the ACS IBR Final Rule). The table at the end of this section inventories the changes as adopted in the ACSs herein.

Incorporation by reference is a mechanism that allows Federal agencies to comply with the requirements of the APA to publish rules in the *Federal Register* and the CFR by referring to material published elsewhere.[162] See sections IV.H.5 and IV.I.4 for detailed summaries of the IBR material to be incorporated by reference. Material that is incorporated by reference has the same legal status as if it were published in full in the *Federal Register*. In accordance with 5 U.S.C. 552(a) and 1 CFR part 51,[163] FAA makes both of the Sport Pilot ACSs for Rotorcraft-Helicopter reasonably available to interested parties by providing free online public access to view on FAA Training and Testing website at www.faa.gov/training_testing. The ACS is available for download, free of charge, at the provided web address. FAA will continue to provide the ACS to interested parties in this manner. For further information, contact the Training and Certification Group at 202-267-1100, acsptsinquiries@faa.gov, or 800 Independence Ave. S.W., Washington D.C. 20591. In addition, both adopted ACSs are contained in the docket for this rulemaking.

FAA recognizes there may be conforming amendments necessary to the three Sport Pilot PTSs currently incorporated by reference in § 61.14 and appendix A.[164] FAA is actively reviewing these three PTSs and will make any conforming revisions through proper notice and comment rulemaking procedures.

Table 6: Record of Changes to ACSs

Document	Change
FAA-S-ACS-26B, Sport Pilot for Rotorcraft Category Helicopter – Simplified Flight Controls Privilege Airman Certification Standards	1. Title: Changed to better align with the other ACS titles in 14 CFR Section 61.14. 2. SH.I.D.K1: Updated to align language with other ACSs for this Task. 3. SH.II.D.R2: Inserted new element “Unexpected or unclear clearances from ATC, if applicable.” to align with other ACSs. 4. SH.II.D.R3: Inserted new element "Hazardous effects of downwash" to align with other ACSs. 5. SH.V.A.S3: Updated to align language with other ACSs for this Task. 6. AOO VI. Performance Maneuvers: editorial changed noted: added single-engine helicopter-simplified flight controls. 7. SH.VII.A.R3: Changed from Unplanned fuel consumption, as applicable, to Unplanned fuel/power consumption, as applicable. 8. Appendix 1: Changed knowledge test code to "SHF" to align with test matrix. 9. Appendix 1. Paragraph “Eligibility Requirements for a Sport Pilot Certificate”: Updated to align with regulatory requirements. 10. Appendix 1. Paragraph “Sport Pilot for Helicopter-Simplified Flight Controls Airman Knowledge Test Table”: Removed Number of Questions, Age, Allotted Time, and Passing Score from the table to ensure accurate knowledge testing requirements do not conflict. Added website hyperlink for current testing matrix requirements. 11. Appendix 1: The entire evaluator responsibilities section was updated to align with published ACS documents. 12. Appendix 1. Table “Sport Pilot for Helicopter-Simplified Flight Controls Privilege to an Existing Pilot Certificate”: Added asterisk to Balloon and Glider under Area of Operation VII to align with the other ACSs. 13. Appendix 1. Table “Addition of a Sport Pilot Privilege for Helicopter-Simplified Flight Controls to an Existing Sport Pilot Certificate”: changed the title of the table to “Existing Sport Pilot Certificate and Privilege(s) Held” by inserting the word Privilege to align with the rule.

	14. Appendix 1. Table "Sport Pilot Privilege for Helicopter-Simplified Flight Controls to an Existing Sport Pilot Certificate": Added asterisk to Balloon and Glider under Area of Operation VII to align with the other ACSs. 15. Appendix 2. Paragraph "Single-Seat Aircraft Practical Test": Changed title of ACS in paragraph to match the title of the document. 16. Appendix 2. Paragraph "Single-Seat Aircraft Practical Test": Replaced "Examiner" with "Evaluator" to align with other ACSs.
FAA-S-ACS-31B, Flight Instructor with a Sport Pilot Rating for Rotorcraft Category Helicopter – Simplified Flight Controls Privilege Airman Certification Standards	1. Title: Changed to better align with the other ACS titles in 14 CFR section 61.14. 2. F.II.I.R5: Changed element from at the discretion of the evaluator, use the autopilot to make appropriate course intercepts, if installed, to use of an electronic flight bag (EFB), if used. 3. FH.II.J.K1. Updated to align language with other ACSs for this Task. 4. FH.V.A.K2: Editorial change to align with other ACSs. Added the word appropriate. 5. FH.V.D.R3: Inserted new element "Hazardous effects of downwash" to align with other ACSs. 6. FH.VII.A.R3: Removed "as applicable" to align with other ACSs. 7. AOO VIII: Second note: Changed to "must" to align with the other ACSs 8. AOO X. Performance Maneuvers: editorial changed noted: added single-engine helicopter-simplified flight controls 9. AOO X, Task B Objective: Added "in a single-engine helicopter-simplified flight controls". 10. FH.X.B.S12: Added "or to the surface" to align with task in other helicopter CFI ACS. 11. Added Risk element. FH.X.C.R14 Main rotor (Nr) speed. 12. FH.XI.B.R9 Removed "as applicable" to align with other ACSs. 13. FH.XI.C.S1: Added powerplant(s). 14. FH.XI.J.K1: Removed "as applicable" to align with other ACSs. 15. FH.XIII.A.S4-S6: Editorial change to make the list number sequentially. 16. Appendix 1: Changed knowledge test code to "IHF" to align with test matrix. 17. Appendix 1, paragraph "Flight Instructor for Helicopter-Simplified Flight Controls Airman Knowledge Test Table": Removed Number of Questions, Age, Allotted Time, and Passing Score from the table to ensure accurate knowledge

	testing requirements do not conflict. Added website hyperlink for current testing matrix requirements. 18. Appendix 1: The entire evaluator responsibilities section was updated to align with published ACS documents. 19. Appendix 1, additional privilege task table: Replaced the title with “Addition of a Flight Instructor with a Sport Pilot Rating for Helicopter-Simplified Flight Controls Privilege to an Existing Flight Instructor Certificate”. 20. Appendix 1, table "Ratings Held": updated title to "Flight Instructor Certificate and Rating(s) Held" 21. Appendix 1, additional privilege task table: Replaced “Privileges” in the additional privileges table with “Flight Instructor with a Sport and Privilege(s) Held” to align with the 14 CFR part 61 terminology. 22. Appendix 1, Flight Instructor Renewal/Reinstatement table: Changed the description above the box from “In accordance with 14 CFR part 61, section 61.199(a) or 61.427, the renewal or reinstatement of a Flight Instructor Certificate, or one rating on a Flight Instructor Certificate, renews or reinstates all privileges existing on that certificate.” to “In accordance with 14 CFR part 61, section 61.197(b)(1), 61.425, 61.199(a)(2) or 61.427(b), a practical test for one of the ratings listed on the flight instructor certificate, or for an additional flight instructor rating, establishes flight instructor recent experience or reinstates all privileges existing on that certificate, as applicable." 23. Appendix 2: Changed “Simulated Powerplant Failure Considerations (Single and Multiengine Helicopters)” to “Simulated Powerplant Failure Considerations (Single and Multiengine Helicopters-Simplified Flight Controls)”. 24. Appendix 2: Changed “Autorotations in a Single-Engine Helicopter” to “Autorotations in a Single-Engine Helicopter – Simplified Flight Controls” to align with other ACSs. 25. Appendix 2: Changed “Helicopter – Touchdown Autorotation Endorsement” to “Helicopter – Simplified Flight Controls Touchdown Autorotation Endorsement” to align with other ACSs. 26. Appendix 2: Replaced paragraph “In lieu of testing the touchdown portion of the Tasks listed below, the evaluator has the discretion to accept a logbook endorsement from a current certificated flight instructor with a rotorcraft category and helicopter class rating who meets the requirements of 14 CFR section 61.195(h)(2). The endorsement must attest that the applicant received touchdown autorotation training and is competent in the instruction of the elements, performance, common errors, and correction of common errors related to straight-in autorotation and autorotation with turns” with “In lieu of testing the touchdown portion of the Tasks listed below, the

	evaluator has the discretion to accept a logbook endorsement from a current certificated flight instructor with a sport pilot rating rotorcraft helicopter-simplified flight controls privilege for the specific make and model being evaluated. The endorsement must attest that the applicant received touchdown autorotation training and is competent in the instruction of the elements, performance, common errors, and correction of common errors related to straight-in autorotation and autorotation with turns for the specific make and model helicopter-simplified flight controls" to align with other ACSs. 27. Appendix 3: Inserted after paragraph X. Performance Maneuvers: Task C. Autorotation with Turns in a Single-Engine Helicopter-Simplified Flight Controls. The minimum entry altitude must be above 700 feet AGL or a suitable higher entry altitude in strong wind conditions. At least two 90 degree turns in the same direction, or one continuous 180-degree turn must be performed. The 180-degree turn refers to a change in direction with respect to ground track, and not an exact reciprocal heading. If the applicant does not roll out of the turn by 300 feet AGL then the evaluator must direct the applicant to perform a power recovery and initiate a go-around, and the Task is considered unsatisfactory to align with other ACSs. 28. Appendix 3, Task E Low Rotor Revolutions Per Minute (RPM) Recognition and Recovery: Added Simplified Flight Controls after the word Helicopter to align the term within part 61.
Both ACSs	1. Editorial changes throughout, such as, changing "rotor(s)" to "rotor" and inserted or deleted "as applicable" or "as appropriate" where appropriate. 2. Forward: Editorial update. Updating to align with the rest of the ACSs. Also, updated email address inserted acsptsinquiries@faa.gov. 3. Inserted Helicopter Flying Handbook (FAA-H-8083-21) into task references as an editorial update to align with other ACSs. 4. Introduction: modified to align with other published ACS documents. 5. Editorial and grammatical changes throughout, such as, aligning language to match the title of the ACS, etc. 6. Appendix 3, Use of Flight Simulation Training Devices (FSTD) paragraph: replace ratings with privilege to align with rule terminology. 7. Appendix 3, Use of Aviation Training Device (ATD) paragraph: replaced ratings with privilege to align with rule terminology. Also, replace the hyperlink to the correct link due to changes in ATD approvals. 8. Removed "as applicable" or "if applicable" after H/V diagram throughout as it is always applicable.

6. Require Sport Pilots and Flight Instructors With a Sport Pilot Rating Seeking to Add an Airplane or Helicopter Privilege to Accomplish a Practical Test

Currently, sport pilots and flight instructors may obtain an additional category and class privilege by passing a proficiency check from an authorized instructor,[165] rather than completing a practical test with a designated FAA examiner.[166] In the NPRM, FAA explained that, because of the significant expansion of privileges associated specifically with an airplane or rotorcraft-helicopter privilege, a proficiency check with an authorized instructor would not be sufficient to validate competency of sport pilots or flight instructors with a sport pilot rating when adding those privileges to their existing certificate.[167] Due to the proposed expansion under this rulemaking, FAA proposed in § 61.321(e) (adopted herein as § 61.321(b)) that certificated pilots (other than student pilots) seeking to add a sport pilot airplane single-engine land or sea or rotorcraft helicopter privilege be required to successfully accomplish both a knowledge and practical test.

FAA received several comments opposing the transition from a proficiency check to a knowledge and practical test. LAMA opposed the proposed framework, stating the NPRM did not provide evidence that the current system of transitioning between light sport categories via a proficiency check is not sufficiently effective or safe. Another commenter echoed a lack of evidence to suggest that a practical test is necessary due to the proposed expansion of privilege, stating that DPE-administered tests are not considered more rigorous than a proficiency check and questioning emphasis on airplane and helicopter testing, specifically. Similarly, some commenters pointed out perceived similarities between a proficiency check and a practical test based on the applicable PTS. Two commenters generally asserted that a proficiency check is sufficient to add a sport

pilot privilege, stating the instructor providing the proficiency check must utilize the PTS when administering the check.

Some commenters expressed concern about a possible strain on DPEs because of the proposed change. One commenter who supported the continued use of proficiency checks explained that applicants must meet the same practical test standards with a flight instructor taking a proficiency check as they would with a DPE, and sport pilot DPEs are in critically short supply in small communities. Another commenter referenced the limited availability of examiners and stated Congress mandated reforms to FAA's DPE procedures in FAA Reauthorization Act of 2018 (P.L. 115-254), section 319 (Designated Pilot Examiner Reforms), which the commenter suggested FAA has yet to implement. Another commenter described that the practical test requirement places an extra burden on existing flight instructors and examiners specifically in the case of light-sport gyroplanes due to the limited number of qualified examiners for gyroplanes and further stated the cost will result in a training barrier, driving many pilots away from becoming gyroplane sport pilots. One commenter explained a proficiency check is supposed to be the same as a practical test for a new pilot, but that the commenter has been told by many CFIs that it is not necessary to conduct the entire practical test and described that they can omit tasks already covered on the original airplane practical test. The commenter then recommended that the proficiency check should be done by a sport pilot examiner who is trained on how to administer the practical test.

FAA disagrees with commenters' suggestions to retain the proficiency check as an acceptable method to add an airplane or helicopter privilege on a person's sport pilot certificate (or flight instructor certificate with a sport pilot rating) and maintains the requirement to take a practical test to add an airplane or helicopter privilege in this final

rule. The significant expansion of operational privileges associated with obtaining an airplane or helicopter privilege and the lack of a minimum experience or training requirements justifies the requirement for the successful completion of a practical test. Commenters are correct that, pursuant to current §§ 61.321(b) and 61.419(b), proficiency checks are conducted in accordance with the applicable PTS. However, assertions that it is unnecessary to conduct the entire practical test and CFI's can omit tasks already covered on an original practical test is inaccurate. A proficiency check or a practical test should inherently ensure a candidate meets the same set of standards. Both designated pilot examiners and flight instructors are required to develop a plan of action, use the applicable testing standards, and evaluate applicants in all tasks included in each area of operation, regardless of whether they are conducting a practical test or proficiency check.[168] However, flight instructors do not receive the same training and oversight as a DPE who has the added responsibility of certification. Unlike flight instructors, DPEs are trained, qualified, and authorized by FAA to ensure practical tests are conducted properly, including the validation of the applicant's knowledge and proficiency in accordance with the applicable testing standards.

In addition, FAA notes the requirement to successfully pass a practical test for an added privilege will only apply to the addition of an airplane single-engine land or sea, or rotorcraft helicopter privileges.[169] Operational risks associated with operating an airplane or helicopter in the NAS, particularly with the expanded aircraft design and performance limitations facilitated by this final rule, include flight operations at notably higher speeds, altitudes, increased weights and capacities, pilot skills, and complex airspace operations, which differ from the other sport pilot privileges such as gliders, powered parachutes, weight shift control, gyroplanes, balloons, and airships. FAA also recognizes that the

minimum experience requirements for an initial sport pilot certificate seeking an airplane or helicopter privilege do not apply when adding a privilege to an existing sport pilot certificate. For example, if a sport pilot holds a glider privilege and seeks to add an additional airplane single-engine land category and class privilege to their sport pilot certificate, the requirements of § 61.321 would apply. This requires the sport pilot to receive a logbook endorsement from an authorized instructor to certify they have met the aeronautical knowledge and flight proficiency requirements for the additional privilege. The pilot must then successfully complete a practical test because they are seeking an airplane single-engine land privilege. In this example, the sport pilot adding the additional category and class privilege would not need to obtain the aeronautical experience of § 61.313(a)(1).[170] This elevates the importance of the evaluation event validating proficiency of a sport pilot seeking to add an airplane or helicopter privilege.

Therefore, this final rule retains the proposed requirement of § 61.321(e), adopted as new §§ 61.321(b), and 61.419(e) for the successful completion of a practical test for both the sport pilot and flight instructor certificate, respectively, when adding an airplane single-engine or rotorcraft helicopter privilege. FAA notes the proficiency check framework continues to be a process that can be used to add a sport pilot privilege other than an airplane single-engine land or sea class privilege or a rotorcraft category, helicopter class privilege (i.e., glider category privileges, rotorcraft category and gyroplane class privileges, lighter-than-air category and airship class privileges, lighter-than-air category and balloon class privileges, powered parachute category land or sea class privileges, and weight shift control aircraft category and land or sea class privileges). Requiring a practical test when a sport pilot is adding an airplane single-engine or rotorcraft helicopter privilege is not overly burdensome, as applicants are

intended to be evaluated on all tasks included in each area of operation, regardless of whether they are conducting a practical test or proficiency check. However, a practical test requires a DPE to conduct the evaluation as opposed to a flight instructor. As previously discussed, DPEs receive training, approval, and oversight from FAA that flight instructors who conduct proficiency checks do not receive. Thus, FAA considers a DPE conducting a practical test as a necessary mitigation in thoroughly validating an applicant for an airplane single-engine land or sea, or a rotorcraft helicopter, privilege.

Regarding commenters' concerns about the new requirement's potential strain on the DPE community, FAA has been intentional in its continual efforts to support and supplement the DPE community nationwide while maintaining safety standards. In light of this continued action, as well as the absence of evidence indicating a future shortage as it pertains to the sport pilot community, FAA does not find that this rule will strain the DPE population. FAA first notes the agency has fulfilled the statutory mandates under section 319 of FAA Reauthorization Act of 2018. This section required FAA to assign to the ARAC the task of reviewing all regulations and policies related to part 183 -appointed DPEs and provide recommendations to the agency to ensure an adequate number of DPEs are deployed and available to perform their duties. Further, the section requires FAA to take such action as the Administrator considers appropriate to those recommendations. FAA notes the final recommendation report was issued in 2021,[171] and FAA has taken several steps to continuously supplement the DPE population, including expanding the minimum qualifications for DPE applicants (including military service) and removing the geographical boundaries limiting DPEs to only the designated area overseen by their managing Flight Standards District Office (FSDO). DPEs who currently have the authority to conduct practical tests in a helicopter, or any other aircraft

with the simplified flight controls designation, will need to obtain the new make and model specific endorsement to qualify to conduct practical tests in helicopters or other aircraft with the simplified flight controls designation. If a DPE receives their initial designee authorization to conduct practical tests in a helicopter or any other aircraft with simplified control privileges, all initial qualification criteria will need to be met.[172]

Relatedly, FAA does not find a requirement that a proficiency check be conducted by a sport pilot examiner as practical or necessary. The commenter's recommendation would otherwise require all proficiency checks be conducted by a DPE. FAA maintains that an authorized instructor can effectively conduct proficiency checks to facilitate additional sport pilot privileges for other than an airplane or helicopter privilege. FAA notes proficiency checks have proven successful since the 2004 introduction of the sport pilot certificate. As previously discussed, due to the expanded operational capabilities of aircraft a sport pilot may operate within the airplane category or the newly added helicopter with simplified flight controls class, FAA finds it necessary to require a practical test when adding those privileges. Conversely, the other categories and classes of sport pilot privileges are not significantly expanded in this final rule and, therefore, the existing proficiency check requirements remain suitable when adding these privileges, given the foundational knowledge a certificated sport pilot or flight instructor with a sport pilot rating will possess.

Several commenters questioned the concept of requiring a knowledge test to add a privilege as contrary to § 61.63(b)(4) and (c)(4), which provide relief from the requirement to complete a knowledge test when adding a rating to an existing pilot certificate, other than for an airline transport pilot certificate. LAMA emphasized there is no knowledge test requirement to add an airplane category or rotorcraft category,

helicopter class rating at the private or commercial level and recommended eliminating the requirement to take a new knowledge test when adding the airplane or helicopter privilege. Similarly, USUA stated requiring additional knowledge tests runs counter to traditional sport pilot and private pilot transition training and knowledge specific to those privileges would be covered in a practical test. It also stated knowledge testing for an added privilege does not increase the safety of pilot applicants since most of the material has already been tested in previous knowledge and practical tests and most of the questions for different categories are drawn from the same pool of knowledge test questions.

After evaluation as to the intent and content of a knowledge test, FAA agrees an additional knowledge test for an added airplane or helicopter privileges would add only a negligible level of safety assurance and may be perceived as inconsistent with § 61.63(b)(4) and (c)(4), which do not require knowledge tests for pilots seeking additional aircraft ratings. A pilot who possesses a category or class privilege or rating has already validated the fundamental aeronautical knowledge required across different aircraft categories and classes, and competency in a new category and or class will be adequately addressed through instructor training, qualifying endorsements and completion of a practical test.

In addition, conducting a practical test requires a demonstration of aeronautical knowledge and skill by validating that an applicant has the appropriate aeronautical knowledge specific to the additional category and class privilege the pilot or flight instructor is seeking to add to their certificate. The oral examination portion of the practical test is individualized to the applicant by the applicant's flight instructor and the DPE evaluating the applicant's existing privileges or ratings and comparing those to the

privilege or rating sought, and validating the applicant has that necessary knowledge. The applicant must demonstrate to both the flight instructor and the DPE conducting the practical test that the applicant has the necessary knowledge of the additional rating that would have been covered during a knowledge test for that rating. This ensures any potential knowledge gaps that may have arisen due to not taking the knowledge test for the rating sought are addressed.

One commenter stated § 61.63 is not applicable to sport pilots and is requesting a permanent change to denote this. FAA disagrees that § 61.63 needs to be modified to explicitly state it is inapplicable to sport pilots seeking additional category or class privileges. Section 61.63 is applicable to pilot certificates that are issued category and class ratings. However, sport pilots are issued privileges to operate categories or classes of aircraft, not ratings, and the requirements for adding privileges to operate an additional category or class of aircraft are found in § 61.321.[173] Therefore, the regulation does not need alteration.

As such, FAA is modifying adopted § 61.321(b) to remove the requirement to take a knowledge test, which will align proficiency validation for sport pilots adding an airplane single-engine or rotorcraft helicopter privilege to their existing pilot certificate via an endorsement provided in their pilot logbook or record to the § 61.63(b)(4) and (c)(4) allowances for adding an aircraft category or class, respectively, without requiring a knowledge test. On the same basis, FAA is also modifying § 61.419(e) to remove the requirement to take a knowledge test for flight instructors with a sport pilot rating adding an airplane single-engine or rotorcraft helicopter privilege. These sections retain the practical test requirement because FAA determined the practical test sufficiently validates that a sport pilot or flight instructor with a sport pilot rating seeking

to add an airplane single-engine or rotorcraft helicopter privilege to an existing certificate by evaluating both the knowledge and skill of the applicant in the oral examination part of the practical test. This final rule also makes one discrete editorial amendment by amending § 61.321(a)(4) to state "authorized instructor" to conform this subsection to other references of authorized instructor within this section.

7. Aviation Training Device or Flight Simulation Training Device Credit, Removal of Certain Light-Sport Aircraft References, and Other Amendments

Currently, FAA does not permit the use of a flight simulation training device (FSTD) or an aviation training device (ATD) to meet sport pilot experience requirements for a certificate or rating. FAA proposed to permit sport pilots to obtain pilot time credit in a FAA-approved ATD or FAA-qualified FSTD[174] to meet the minimum experience requirements for sport pilot certificate, consistent with FAA's long-standing, and expanding, allowance to credit simulation training in certain circumstances. Specifically, FAA proposed sport pilots could credit up to a total of two and a half hours of training in an FSTD or ATD (or a combination) representing the appropriate category and class of aircraft to meet the experience requirements of part 61 in new § 61.313(b). FAA received four comments, generally supporting the provision and subsequently adjudicated, and adopts § 61.313(b) as proposed, with a minor grammatical revision.

ALPA stated if an FSTD is used for an evaluation facilitating a type rating or a category and class rating, the training should be accomplished in a full flight simulator (FFS) with six degrees of motion and sufficient training accomplished in advance of the evaluation. ALPA further stated, if any new forms of training like virtual or mixed reality were to be used, it should only be after the qualification standards have been established and should not replace in-aircraft training.

FSTDs are approved under part 60, which sets forth qualification requirements and would include any new types of simulators yet to be developed, such as virtual reality designs. In addition, all FSTDs must be sponsored by the holder of a certificate under parts 119, 141 or 142[175] and may only be used within an FAA-approved training program. Use of an FFS with motion for pilot evaluations or testing is under the supervision of an FAA aviation safety inspector who will evaluate the training device and approve the use of qualified FFS within a FAA-approved training program. FAA notes that flight schools and individuals providing instruction under part 61 do not hold a part 119, 141, or 142 certificate or have an FAA-approved training program and are not eligible to provide training in an FSTD to meet aeronautical experience requirements of a certificate or rating. However, these part 61 training providers may provide training in an FAA-approved ATD as specified in that ATD's FAA-issued letter of authorization.

Specific to ALPA's concern, FAA notes the training in an FSTD or ATD that may be credited towards a sport pilot certificate under § 61.313(b) is not applicable to pilot type ratings because type ratings are not issued at the sport pilot certificate level. Furthermore, FAA notes the maximum 2.5-hour aeronautical experience credit in an FSTD or ATD comprises 12.5% of the minimum 20 hours total aeronautical experience requirements for airplane category or 8.3% for helicopters with simplified flight controls. As such, FAA does not consider this FSTD or ATD credit to be a safety risk because an applicant for a sport pilot certificate or privilege will still obtain the vast majority of their aeronautical experience in an aircraft.

Two commentors are in favor of the 2.5 hours of credit time in an ATD for sport pilots. In addition, Pivotal Aero stated it agrees with the adoption of the 2.5 hours in an ATD. However, it suggested that FAA should allow additional simulation pilot time

credit above the 2.5 hours for aircraft with simplified flight controls. It stated there is a high degree of similarity between aircraft and the ATD.

ATDs or FSTDs may represent aircraft with a simplified flight controls system; however, FAA finds no reason to provide more credit for such ATDs or FSTDs just because it represents an aircraft with a simplified flight controls system, especially where this is a new class of aircraft introduced into sport pilot privileges. After FAA collects more data regarding aircraft equipped with simplified flight controls and simulators that represent those same aircraft, as well as consideration of the expanded type of aircraft a sport pilot may become certificated to operate, FAA may consider additional pilot time credit in future rulemakings for simplified flight controls aircraft or aircraft, generally. FAA notes it does not limit the number of instructional training hours logged in an FAA-qualified FSTD or FAA-approved ATD but does establish the maximum allowable time that may be credited for a certificate or rating. In other words, should an applicant feel additional training is needed, that applicant is free to seek training in an FSTD or ATD, but only 2.5 hours will be credited toward the aeronautical experience requirements.

8. Miscellaneous Comments

These are comments that did not fit in other sections but pertain to the rulemaking.

a. Standing Minimum Experience Requirements in § 61.313

Currently, § 61.313(a) requires a person applying for a sport pilot certificate with an airplane category and single-engine land or sea class privileges to log at least 20 hours of flight time, including certain flight training time minimums, cross-country flight training, and takeoffs and landings. The NPRM did not propose revisions to these standing aeronautical experience requirements. However, several commenters raised

concerns about the minimum 20 hours of flight time for airplane category privilege and suggested FAA should increase the flight training requirements for new sport pilots to 30 or 40 hours of flight time to parallel recreational pilots (30 hours) or private pilots (40 hours). Commenters asserted that sport pilots, recreational pilots, and private pilots can operate many of the same aircraft with relatively minor differences in privileges and limitations. Commenters specifically suggested increasing the minimum flight hours commensurate with expanded privileges through a gradual process to retain the basic sport pilot privileges as previously available since the 2004 final rule (i.e., the 20 hours of flight time to obtain a sport pilot certificate with airplane privileges).

However, this final rule does not increase the minimum experience requirements for a sport pilot certificate for airplane category, single-engine class privileges. The 2004 final rule adopted the minimum hours of experience for the sport pilot certificate. In that rule, FAA explained it expected that the 20-hour minimum flight time requirement for all aircraft (except gliders, balloons, and powered parachutes) to be adequate to train a person to exercise the privileges of a sport pilot given the limited types of aircraft sport pilots may operate and operations they are authorized to conduct. In addition, FAA noted the applicant for a sport pilot certificate must receive a recommendation by an authorized instructor who endorses the applicant's logbook indicating readiness to take and pass the practical test; pass a knowledge test on the general knowledge requirements necessary to exercise sport pilot privileges and operate light sport aircraft in the NAS; and demonstrate to FAA (or FAA-designated examiner) that the practical test standards can be met.[176] No evidence or data has been provided to suggest those minimum experience requirements need to be changed.[177]

FAA did not propose changing the minimum experience requirements set forth in current § 61.313(a) through (h) for a sport pilot certificate and making any changes to those minimum experience requirements would require an additional public notice and comment. Furthermore, authorized flight instructors are responsible for ensuring an applicant for a pilot certificate rating or privilege is proficient in the areas of knowledge, skill, and proficiency listed in part 61 and FAA practical test standards for a sport pilot certificate before providing a recommendation to take a practical test in accordance with § 61.39(a)(6) or to provide a proficiency check. The minimum experience requirement does not eliminate the need to meet these testing standards and applicants often exceed the minimum hourly experience and training requirements to ensure pilot proficiency.

Another commenter stated the proposed reduction of flight hour requirements for sport pilots raises the risk of these pilots making uneducated decisions and actions in the cockpit and urges FAA to reconsider. FAA notes the NPRM did not propose to, nor does this final rule, reduce the overall flight hour requirements for sport pilots. While a sport pilot certificate requires reduced flight hours for certificate eligibility, compared to higher grades of certificates, FAA maintains the sport pilot training framework adequately addresses the operational regime facilitated by a sport pilot certificate (as largely discussed herein).

In addition, a commentor requested changes to the aeronautical experience requirements for weight-shift control, specifically tuck/tumble awareness and spiral recovery training. Upon review of the sport pilot PTS, those tasks are already included in the emergency operations area of operation.

b. Safety Pilots

A few commenters, including Fly Eagle Sport, suggested FAA permit sport pilots to act as a safety pilot. Another commenter stated permitting sport pilots to act as a safety pilot would allow a sport pilot to log flight time, add utility to a sport pilot certificate, help aspiring professional pilots build pilot time, and improve safety by encouraging two qualified pilots to fly together. One commenter recommended FAA clarify that private pilots exercising sport pilot privileges are not restricted from acting as safety pilot because instrument rated pilots practicing under simulated conditions enhances safety. The commenter also suggested that § 91.109(c)(1) should be retained for private pilots exercising sport pilot privileges.

Section 91.109(c) requires a safety pilot for operations in simulated instrument flight. A private pilot exercising sport pilot privileges cannot act as a safety pilot because a sport pilot is restricted from serving as a required flight crewmember on any aircraft for which more than one pilot is required by the regulation under which the flight is conducted (i.e., § 91.109(c)).[178] A person who seeks to act as a safety pilot must satisfy the minimum pilot certificate requirements listed in § 91.109(c)(1), which limits persons acting as safety pilots to pilots with a private pilot certificate or a higher grade of pilot certificate[179] because of the expected responsibilities associated with acting as a safety pilot. For example, safety pilots take on a quasi-supervisory role to ensure safety of the flight when the PIC is accomplishing and executing instrument procedures and associated communications with ATC in simulated instrument conditions, including aircraft separation and crew coordination responsibilities. Sport pilots are not permitted to act as a safety pilot because the risk associated with serving as a safety pilot is inconsistent with the level of training and experience required by sport pilots. Specifically, private pilots require more aeronautical experience than sport pilots, including some experience sport

pilots do not receive. For example, private pilots are tested in areas that sport pilots are not, including navigation systems and radar services, which includes the use of onboard navigation systems to determine the aircraft's position. The role of safety pilot inherently involves monitoring another pilot's maneuvering of an airplane solely by reference to instruments and relies upon the use of navigation systems and radar services. Due to sport pilots' lack of this additional training and experience in these areas, FAA finds it necessary to retain the existing § 91.109(c)(1) requirement for a safety pilot to hold at least a private pilot certificate.

Because sport pilots may not act as a safety pilot, as discussed above, therefore suggestions regarding the logging of sport pilot flight time as a safety pilot are beyond the scope of this rule.

c. General Comments Regarding Aircraft Sport Pilots May Operate

The United States Hang Gliding & Paragliding Association (USHPA) commented in support of the stated justifications for the proposed amendments. Specifically, it expressed support of the expansion of sport pilot privileges as defined in the proposal, noting that in some cases, the expansion of sport pilot privileges will require additional training and a flight instructor qualifying endorsement and additional experience.

One commenter suggested FAA should permit sport pilots to operate three-seat powered parachutes due to the safety record of powered parachutes. Because the commenter did not provide safety data comparing the operation of two-seat vs. three-seat powered parachutes, or a specific safety reason or justification to permit sport pilots to operate powered parachutes, FAA is not expanding the seat limitation for powered parachutes.

One commenter stated prior to the 2004 final rule, unlicensed pilots were allowed to tow hang glider pilots who were rated by USHPA. The commenter requested FAA consider further expanding sport pilot privileges to include towing hang gliders. FAA did not consider allowing the expansion of sport pilot privileges for the towing of hang gliders due to the minimal aeronautical experience required to obtain a sport pilot certificate. FAA continues to support the 2004 final rule, which affirmed a person must possess at least a private pilot certificate or higher to conduct towing operations as specified in § 61.69, including any associated private pilot qualifications and a minimum 100 hours of PIC experience. FAA considers this necessary to mitigate risks of towing operations, which are higher due to the inherent involvement of multiple aircraft and pilots. Similarly, FAA notes towing privileges were also not extended to recreational pilots. Therefore, this final rule does not expand operational privileges to include glider and unpowered ultralight vehicle (i.e., hang glider) towing.

Another commenter recommended FAA permit a private pilot with a glider rating who is seeking a sport pilot airplane privilege have reduced minimum experience requirements under § 61.313 to qualify because the areas of operation on the practical test are almost identical for airplane and glider.

FAA notes that a pilot who holds a higher grade of pilot certificate, including private pilot, may add an additional sport pilot category or class privilege to their existing certificate, in accordance with § 61.321, without meeting the aeronautical experience requirements of § 61.313 for that additional category or class. However, § 61.321 does not explicitly state that it applies to holders of either a sport pilot certificate or a higher-grade certificate, which may have contributed to the commenter's misunderstanding. Consequently, this final rule amends § 61.321 to clearly state that it applies to holders of

a sport pilot or higher-grade certificate seeking privileges to operate an additional category or class of aircraft at the sport pilot level. For similar reasons, this final rule also amends § 61.419 to clarify that it applies to holders of flight instructor certificates issued under subpart H or flight instructor certificates with a sport pilot rating seeking privileges to provide training under subpart K in an additional category or class of aircraft.

d. Powered-Lift

The § 1.1 definition of light-sport aircraft excludes powered-lift from being a light-sport aircraft. While the NPRM proposed to allow airworthiness certification of powered-lift as light-sport category aircraft under § 21.190, FAA did not consider powered-lift privileges for sport pilots, nor did FAA consider expanding powered-lift privileges for sport pilots in the recent Integration of Powered-Lift final rule. FAA noted in both rules that this is due to the complexity and ongoing development of powered-lift designs and associated pilot certifications and operational rules.[180] ALPA supported FAA's decision not to consider a powered-lift privilege for sport pilots. In contrast, Doroni Aerospace, AIR VEV, and GAMA requested FAA to reconsider its position on sport pilot privileges for powered-lift. Doroni Aerospace and AIR VEV suggested enabling sport pilot powered-lift privileges is similar to permitting sport pilots to operate helicopters.

FAA notes the long history of experience with helicopters, which have been widely produced, and operated for decades. Though helicopters with simplified flight controls will change how a pilot operates these helicopters, the underlying knowledge and skills necessary to safely operate this longstanding category and class of aircraft within the NAS is well understood. In contrast, powered-lift are still largely under development. As a result, FAA and industry do not have data or operational experience

on the integration of powered-lift aircraft in the NAS. Without this data and experience, FAA cannot accurately reassess the minimum pilot standards for powered-lift aircraft to consider sport pilot operations.

e. Recreational Pilot Certificate[181]

FAA did not propose any changes concerning recreational pilot certificate experience, ratings, or privileges. Several commenters opined on the proposed sport pilot operational privileges and limitations and compared to those experience requirements, privileges, and limitations with those of higher-grade certificates, including recreational pilot certificates. Commenters suggested FAA revise the recreational pilot privileges and limitations or remove the recreational pilot certificate and include those pilots in the sport pilot category. One commenter recommended revisions to § 61.303(a)(2)(ii) to relieve pilots who hold a higher grade of pilot certificate seeking to exercise sport pilot privileges to be exempt from the training and endorsement requirements of § 61.315(c)(14)(i), specific to aircraft with a V_H greater than 87 knots CAS, or § 61.315(c)(14)(ii), specific to operating aircraft with a V_H less than or equal to 87 knots CAS. This includes training and endorsement requirements specified in § 61.327(b). One commenter recommended that the sport pilot certificate should become the "de facto" initial pilot certificate, including testing by a DPE, with the ability to upgrade to a private pilot certificate using additional training and endorsements and a phasing out of the recreational pilot certificate.

In response to the recommendation to revise recreational pilot operating privileges, or to remove the recreational pilot certificate and then provide recreational pilots with a sport pilot certificate, such a significant rule amendment would require additional public notice and comment because it was not proposed in the MOSAIC

NPRM. Due to the differences in operational limitations for a recreational pilot certificate, removing the recreational pilot certificate and replacing it with a sport pilot certificate or revising the recreational pilot operating privileges and limitations would require additional consideration and analysis of the safety risks, benefits, and impact of such a change on existing certificate holders as well as other users of the NAS. Such a change would be out of scope for this final rule, because FAA did not provide notice of the potential for such a change and an opportunity for comment. FAA notes a recreational pilot or higher-grade certificate can currently obtain sport pilot privileges by accomplishing a proficiency check or practical test; however the limitations of the recreational pilot must still be adhered to. In response to the recommendation that pilots with a higher grade of pilot certificate exercising sport pilot privileges should be excluded from the endorsement requirements of § 61.315(c)(14)(i) and (ii) and § 61.327(b), FAA contends these sport pilot training and endorsement requirements remain necessary to ensure competency for pilots who may not have experience in aircraft with those specific performance parameters.

f. Out of Scope Comments

FAA received multiple comments that were considered out of scope. Some of these comments included special flight authorizations and aerial task privileges for commercial pilots. These comments are wholly outside the scope of this final rule, but FAA may consider changes in future rulemaking.[182]

One commenter stated they hold a TCCA Recreational Pilot Permit and would like to see a reciprocal agreement between FAA and TCCA to allow FAA sport pilot certificate holders to operate within Canada and TCCA Recreational Pilot Permit holders to operate in the United States. FAA notes that bilateral or multilateral agreements with

foreign Civil Aviation Authorities were not addressed within the scope of this rulemaking; however this does not preclude new or updated agreements in the future, following the standard agreement process.

g. General Comments Pertaining to the NPRM

Aviation Impacted Communities Alliance (AICA) expressed concern that the proposed MOSAIC rule increases operating privileges, rendering the sport pilot the default certificate for flight training. While this final rule does increase various operating privileges of sport pilots, FAA does not share AICA's concern that the effect of the increase in the operating privileges will result in the sport pilot certificate becoming the default certificate for flight training. FAA notes the certificate chosen is the applicant's choice and the applicants still may choose sport, recreational, or private certification when seeking initial flight training.

Another commenter suggested eliminating the requirement for sport pilots to carry a logbook while in flight to mirror private pilot requirements. Section 61.51(i)(3) requires a sport pilot to carry his or her logbook or other evidence of required authorized instructor endorsements on all flights. FAA declines to remove this requirement because, unlike private pilots, a sport pilot does not carry ratings listed on their certificate as evidence of his or her qualification to act as PIC of a particular aircraft using sport pilot privileges. Instead, a sport pilot's privileges are documented through logbook endorsements. FAA also notes that, under the regulation, sport pilots may choose to carry other evidence of the required authorized endorsements instead of the logbook.

One commenter stated complex aircraft and technically advanced airplanes (TAAs) should require additional training and an instructor endorsement for sport pilots. A sport pilot seeking to operate a complex airplane must receive training and a qualifying

flight instructor endorsement, in accordance with § 61.31(e). However, FAA does not recognize, nor was provided with documentation of, additional risk for sport pilots to mandate additional training and flight instructor endorsements for pilots who wish to operate a complex airplane or TAA. Furthermore, FAA does not require additional training and an instructor endorsement to operate a TAA for any pilot, regardless of their grade of pilot certificate. However, FAA does recommend that any pilot who intends to operate an aircraft with avionics systems they are not familiar with consider seeking avionics familiarization training with an authorized instructor.

GFTA stated FAA's proposal would permit the use of turbine powerplant technology in light-sport category aircraft and recommended eliminating the type rating requirement for operators of turbojet powered light-sport aircraft. Desert Aerospace, LLC and Sonex Aircraft suggested FAA remove type rating requirements for turbojet-powered light-sport category airplanes and recommended a logbook endorsement to operate those airplanes.

FAA notes that a person who acts as PIC of certain aircraft, pursuant to § 61.31, must hold a type rating for that aircraft, which includes turbojet powered airplanes.[183] FAA did not propose revising this requirement, which applies to all aircraft at all certificate levels (including sport pilots). FAA is retaining the type rating requirement for pilots who seek to operate turbojet-powered aircraft due to the complexity associated operating those aircraft. However, it was not the intention of FAA to allow a sport pilot to operate an aircraft that requires a pilot to hold a type rating due to the complexity associated with operating those aircraft and the training footprint of sport pilots. FAA has long maintained that the performance, environment, and operating characteristics of turbojet-powered airplanes require the PIC to demonstrate proficiency operating that

specific airplane[184] and FAA does not find a compelling reason to lift the type rating requirement for all aircraft. However, this final rule amends § 61.315 to specifically state that a sport pilot may not act as pilot in command of an aircraft that requires a pilot to hold a type rating in accordance with § 61.31(a). FAA notes Desert Aerospace's reference to turbine powered aircraft is a broad term that includes both turbojet and turboprop powerplants, but the type rating requirement only applies to "turbojet" powered aircraft.

In addition, Desert Aerospace recommended modifying § 61.58(a) to exclude gliders and turbine powered light-sport category aircraft or light-sport category aircraft equivalent airplanes. Sonex also recommended removing the § 61.58 requirements for a yearly pilot proficiency check to carry a passenger in a turbojet-powered light sport airplane.

FAA notes that § 61.58(a) sets forth the PIC proficiency check requirements for the operation of an aircraft that requires more than one pilot flight crewmember or is turbojet-powered. As previously discussed, this final rule amends § 61.315(c) to specifically state that a sport pilot may not act as PIC of an aircraft that requires a type rating in accordance with § 61.31(a). Consequently, the § 61.58 requirements are inapplicable to aircraft that may be operated under sport pilot privileges. FAA further notes that the self-launching, turbojet-powered gliders that Desert Aerospace refers to have operating limitations that require an FAA-issued authorization to act as PIC. In these circumstances, the existing requirements for meeting the aircraft operating limitations and FAA authorization remain applicable and may require compliance with § 61.58. This rulemaking does not change the existing requirements for these aircraft.

One commenter suggested that multiengine airplanes would be an acceptable privilege for sport pilots and requested clarification on whether a sport pilot can seek privileges to operate a multiengine airplane with a single-engine class privilege. In addition, GFTA asked for clarification on whether a light-sport aircraft with more than a single powerplant would require a sport pilot multiengine rating and asked if this would be analogous to flying a light-sport aircraft seaplane without a seaplane rating.

FAA did not propose a new airplane category "multiengine class" privilege for sport pilots. The multiengine reference is specific to the rotorcraft category, multiengine helicopters, which may include helicopters with more than one engine or multi-rotor designs. Under the permissible category and class privileges available to sport pilots outlined in § 61.313, helicopters may have more than one engine or rotor and still be operated by a sport pilot with a rotorcraft-helicopter privilege. In addition, sport pilots who intend to operate a seaplane must obtain an airplane category and single-engine sea class privilege to operate single-engine seaplanes.

One commenter opposed the proposed § 22.100(a)(4),[185] which indirectly allows sport pilots to operate light-sport category aircraft at an increased maximum speed of 250 knots CAS. The commenter asserted that sport pilots cannot safely operate at that speed without additional training and higher grade of pilot certificate. Accordingly, the commenter suggested a maximum CAS of 200 knots as a sport pilot certificate limitation.

As explained in the NPRM, a maximum speed of 250 knots CAS was intended to provide an upper limit appropriate for a category of aircraft intended for recreation and flight training for sport pilots to operate.[186] However, FAA did not propose to impose a speed limitation on the sport pilot certificate. Therefore, this comment is out of scope for this final rule. In addition, FAA does not have a safety concern with this change in light-

sport aircraft certification because aircraft that may be operated under sport pilot privileges are limited by § 61.316 performance and design limitations. Specifically, the stall speed limitation in § 61.316(a)(1) indirectly limits the maximum cruise speed of the aircraft that may be operated under sport pilot privileges.

One commenter asked hypothetical questions regarding specific operational privileges. Specifically, the commenter asked whether a person could travel to their job in an airplane under the provisions of this rule or do non-passenger carrying commercial work. The commenter further asked for justification and data if FAA did not permit these operations.

FAA notes that subpart J of part 61 does not prohibit sport pilots from using an aircraft for personal use or travel. Section 61.315 provides the privileges and limitations of a sport pilot certificate, and a sport pilot determines whether his or her operation is characterized by any of the limitations prior to operation. With respect to the commenter's question regarding whether sports pilots are allowed to conduct non-passenger carrying commercial work, § 61.315(c)(2) prohibits a person from acting as PIC of a light sport aircraft for compensation or hire, and FAA did not propose any revisions to that specific limitation in the NPRM. Therefore, a sport pilot would not be permitted to conduct non-passenger commercial work if the sport pilot were to receive compensation for it. FAA notes that what constitutes compensation is not limited to profit, profit motive, or the actual payment of funds, but is the receipt of anything of value that is contingent on the pilot operating the aircraft.[187] GAMA recommended changing the section heading from "design requirements" to "parameters," stating that "design requirements" appears to be blurring the lines between aircraft certification and pilot privileges/limitations. GAMA stated the section is intended to prescribe

requirements that establish the parameters and performance limitations for the aircraft in which a sport pilot may act as pilot in command. Though understanding GAMA's suggestion, FAA declines to change the terminology used because § 61.316 is meant to define aircraft design criteria allowed for sport pilots to operate.

One commenter recommended FAA permit sport and private pilots to log flight time as second in command (SIC) by acting as copilot. The commenter also suggested that allowing a sport pilot to act as SIC would facilitate safety with a two-pilot flight deck and provide an additional pathway to meet recency and log additional pilot time for advanced certifications.

Currently, in accordance with § 61.55, FAA does not permit sport pilots to serve as SIC. As a result, a sport pilot cannot log flight time as SIC in aircraft that only requires one pilot under the type certification of the aircraft to operate as pilot in command.[188] If a private pilot complies with § 61.55, they may log SIC time. FAA did not consider amending § 61.55 to include the sport pilot certificate, as a sport pilot certificate was created for recreational purposes and not intended to fulfill a safety-sensitive role such as safety pilot, which essentially amounts to a two-pilot flight crew operation. Therefore, changes to the requirements for logging second-in-command flight time for a sport pilot are outside the scope of this rule.

One commenter recommended revising § 61.109(i) to permit student pilots seeking a private pilot certificate to credit training from a flight instructor with a sport pilot rating (subpart K) to normalize the inclusion of aircraft with more than one seat and avoid disenfranchising the employment of subpart K instructors training sport pilots at flight schools that already have subpart H instructors employed. Training from a flight instructor with a sport pilot rating (subpart K) can be credited to the experience

requirements for a private pilot certificate; however, a student pilot receiving training from the subpart K flight instructor must have obtained their sport pilot certificate before that training time can be used as pilot time credit toward a private pilot certificate.[189]

Another commenter suggested that a private pilot certificate appears to have twice the requirements as a sport pilot certificate, but that the difference is much smaller in practice, and recommended FAA allow sport pilots to obtain private pilot privileges after obtaining a certain number of flight hours. This commenter also contends research shows that experience is part of increased safety, but did not provide the source of the research referenced. A sport pilot can obtain additional training and experience leading to the issuance of a private pilot certificate. However, because of the expanded privileges associated with a higher grade of pilot certificate, an applicant still would need to meet all the additional experience requirements and medical qualifications for that certificate.

One commenter suggested allowing a private pilot who is flying under sport pilot privileges without a valid medical be allowed to operate at VFR minimums and VFR-on-top, because such pilots have already demonstrated proficiency. A pilot must comply with the privileges and limitations of the certificate that he or she is exercising. Therefore, even though the private pilot would have demonstrated proficiency at the private pilot level, the pilot would be exercising sport pilot privileges and would be subject to those privileges and limitations. Section 61.315 does not allow for the operations suggested by the commenter, and FAA did not consider amending § 61.315 to permit these types of operations.

NAFI requested that FAA should provide outreach via advisory circulars and social media to help foster a clear understanding of the new rules. It is FAA's intent to

implement the rule to the public by way of communications, webinars, and published guidance.

9. Conforming Amendments

This final rule makes conforming amendments to replace "a light-sport aircraft" with "an aircraft" in the following sections: §§ 61.1(ii), 61.89(c)(5), 61.113(h), 61.327, 61.412; 61.415(e), 61.415(f), 61.415(g), 61.423(a)(2)(iii)(C), and 61.423(a)(2)(iii)(D). Similarly, this final rule makes conforming amendments to replace "a light-sport aircraft" and with "an aircraft meeting the performance limits and design requirements of § 61.316" in the following sections: §§ 61.23(c)(1)(i), (ii), (iii), and (iv); 61.23(c)(2)(iv); 61.89(c)(1); 61.325; 61.327(a); 61.327(b); 61.411(a)(1)(v), (b)(1), (c)(1)(v), (d)(1)(v), (e)(1)(iii), (f)(1)(v), and (g)(1)(v). Finally, this final rule makes conforming amendments to remove "light-sport" from the following sections: §§ 61.45; 61.313; 61.317; 61.321; 61.321(a)(1), (2), and (4); 61.325; 61.327(a)(2) and (b)(2); 61.403(b); 61.417; 61.423(a)(2)(iii)(A), (a)(2)(iv), and (b). The removal of the reference to light-sport aircraft in subpart J is consistent with FAA's removal of the definition for these aircraft in § 1.1. Where appropriate, FAA has removed the reference to light-sport aircraft and replaced it with a reference to new § 61.316, which sets forth the performance limitations for the aircraft a sport pilot may operate. As explained in section IV.H.1 of this preamble, this change in terminology is accompanied by broadening some of the limitations that currently exist in the definition of light-sport aircraft in § 1.1.

Section 61.3 speaks to pilot certificates, ratings, and authorizations that are required to operate aircraft in the United States. Currently, the privileges provided in § 61.313 are not codified in § 61.3. In the NPRM, FAA also proposed a conforming amendment to § 61.3 that adds a new paragraph requiring that a sport pilot exercising the

privileges listed in § 61.313 receives a qualifying logbook endorsement for the appropriate category and class privilege, as applicable. This clarification to § 61.3 is required because sport pilots do not obtain a rating issued on a sport pilot certificate, but instead they receive an endorsement in their logbook facilitating the appropriate category and class "privilege," as referenced in § 61.317. FAA did not receive comments on this proposal and adopts this conforming amendment as proposed.

Finally, in the NPRM, FAA noted § 61.305 is improperly formatted as it sets forth a paragraph (a) but no corresponding paragraph (b) and proposed to redesignate existing paragraph (a) as introductory text, existing paragraph (a)(1) as new paragraph (a), and existing paragraph (a)(2) as new paragraph (b). No substantive changes were proposed for this section and no comments were received. Therefore, this final rule reformats § 61.305 as proposed.

Additional conforming amendments are throughout the regulatory instructions as they are changed along with other regulatory changes. FAA received no public comments on these conforming amendments.

I. Repairman Certificates (Light-Sport)

Part 65 provides the requirements for certification of airmen other than flight crewmembers, including certification of a repairman in subpart E. In the NPRM, FAA described the existing regulations prescribing eligibility requirements, privileges, and limitations of the repairman (light-sport aircraft) certificate[190] and discussed several proposed amendments related to certification, privileges, and limitations of light-sport repairmen. FAA received approximately 400 comments overall on the proposals related to light-sport repairmen training, certificates, and privileges, from approximately 230 different commenters. This section discusses the adopted provisions and adjudicates

the received comments. Throughout this section, FAA will refer to repairman certificate (light-sport) holders as "light-sport repairman" and "repairman certificate (light-sport)" as "light-sport repairman certificate" for readability.

1. Revisions to Terminology

In the NPRM, FAA proposed several amendments to part 65 terminology to conform to other substantive proposals made in the NPRM.

First, FAA proposed to change the certificate title of ''repairman certificate (light-sport aircraft)'' to ''repairman certificate (light-sport)'' to align with the removal of the § 1.1 definition of "light-sport aircraft" and future aircraft certification in the light-sport category.[191] One commenter asked how to request a replacement certificate with the new title. It is not necessary for a repairman with a repairman certificate (light-sport aircraft) to replace their certificate with a certificate displaying the new certificate title. As discussed in the NPRM, light-sport repairman certificates issued before a final rule effective date will remain valid, as FAA did not propose or adopt changes to existing privileges or limitations to ratings on a repairman certificate. However, an airman can request a replacement certificate through FAA's Airmen Online Services.[192] After the applicable effective date of this final rule, a replacement or amended certificate will display the new certificate title. Advisory Circular AC 65-32B, Certification of Repairmen (Light-Sport) provides additional information on the procedures for requesting a replacement or amended certificate.

One commenter asked that FAA consider leaving the certificate title as-is, stating that changing the title will only cause confusion. As discussed in the NPRM, FAA considered the impact the certificate title change would have when developing the proposal. FAA maintains that changing the certificate title will be beneficial over the

long-term, reducing confusion between currently designated "light-sport aircraft" under the § 1.1 definition, which will be removed on [INSERT DATE 365 DAYS AFTER PUBLICATION OF FINAL RULE], and future light-sport category aircraft. During analysis of the comment, FAA noted changing the certificate title to repairman certificate (light-sport) in part 65 would inadvertently result in the certificates issued before this final rule takes effect unrecognized in part 65, since the adopted regulations will solely refer to "repairman certificate (light-sport)." To address this discrepancy, this final rule adds language under new § 65.107(f), which is discussed further in section IV.I.2.d of this preamble.

Therefore, FAA adopts the certificate title change to "repairman certificate (light-sport)," as proposed, in § 65.107 and new § 65.109. The NPRM proposed a conforming amendment in § 91.327(c)(1) to reflect the certificate title change, and subsequently identified conforming amendments are necessary in § 91.327(b)(1) and (b)(2) and § 91.319(g)(1). FAA makes these conforming amendments in §§ 91.319(g)(1), 91.327(b)(1) and (2), and 91.327(c)(1).

Second, FAA proposed removing the term "light-sport aircraft" in §§ 65.107 and 65.109 when defining what aircraft are included in the light-sport repairman certificate privileges. Instead, when defining aircraft privileges, § 65.109 would directly cross-reference the applicable aircraft, as defined by the airworthiness certificate issued for the aircraft under part 21. FAA did not receive comments on this terminology change and adopts the removal and cross-references.

Third, FAA proposed to replace references to "class" of aircraft with "category" of aircraft in amended § 65.107 and new § 65.109. In the NPRM, FAA discussed that § 1.1 defines those terms differently depending on whether the term is being used in the

context of either aircraft certification or airman certification. With respect to airman certification, "category" refers to a broad classification of aircraft[193] and "class" refers to a classification of aircraft within a category having similar operating characteristics[194]. Consistent with these definitions, part 65 does not establish repairman certificate privileges and limitations by aircraft operating characteristics; rather, privileges and limitations are defined by a broad classification of aircraft. FAA finds the use of "category" to be the correct term to describe light-sport repairman certificate privileges. FAA did not receive comments on this editorial correction and adopts the proposal to replace the term "class" with "category" throughout § 65.107 and new § 65.109.[195] However, FAA may issue light-sport repairman certificates with aircraft category privileges that are limited to a class within the category (e.g., rotorcraft category, helicopter class). To facilitate aircraft class limitations for training course content and subsequent class limitations within category privileges on a repairman certificate, this final rule adds class applicability to §§ 65.107(c), 65.107(d), 65.107(e)(3)(iv), 65.109(a)(3), and 65.109(b)(3). This preamble provides additional discussion on training courses designed for a class within a category in section IV.I.7.d and on limiting light-sport repairman certificate privileges to a class within a category in sections IV.I.8 and IV.I.10.a.

This final rule also makes a conforming change to § 65.109(a)(2) and (b)(2) by changing "experimental certificate" to "experimental airworthiness certificate" to remain consistent with the terminology of § 21.191 and the explanation in section IV.I.2 of the NPRM that experimental certificates are experimental airworthiness certificates. FAA did not receive any comments on this terminology change for § 21.191.

In addition, as discussed in the NPRM, FAA finds the modifier of "particular" to "class" in current § 65.107(a)(2)(ii) and (a)(3)(ii) superfluous, as there is no related distinction established in § 1.1 definitions. FAA did not receive comments on this editorial revision and removes the term "particular" as a modifier of "class" in adopted §§ 65.107(c) and 65.107(d) from this section.

Finally, in the NPRM, FAA explained that the language "approve and return to service" is not accurate in the context of repairman and mechanic certificate privileges because these certificate holders do not "return" aircraft to service. FAA proposed to use the language "approve for return to service" in §§ 65.81(a), 65.85(a) and (b), 65.87(a) and (b), and new 65.109(b)(1) (formerly § 65.107(c)(1)) to align with the privileges provided in part 65 and to be consistent with part 43 maintenance regulations. FAA received one comment on this proposed change from AEA/ARSA, which stated the proposed changes to § 65.81 are unrelated to the MOSAIC rulemaking and, as such, FAA has not provided appropriate notice as required by the APA with regard to the intended applicability of this change and persons affected by this proposal.

The language "approve and return to service" is inaccurate because an aircraft is not "in service" until it is flown or operated. The holder of a repairman or mechanic certificate cannot "return" the aircraft to service under the privileges of that certificate as flying an aircraft is not a privilege bestowed by any regulation in part 65. Rather, the certificated mechanic or repairman approves the aircraft for its return into service. Further, FAA finds that the public was provided sufficient notice of this proposed amendment to change the regulatory language to "approve for return to service," FAA exercised appropriate discretion in including this amendment under this rulemaking given its relation to part 65 repairmen certificates, and would have considered all comments

received regarding this amendment. However, FAA did not receive any other comment on this revision and maintains the amendment is a nonsubstantive revision for accuracy; this final rule adopts the regulatory language to "approve for return to service" in §§ 65.81(a), 65.85(a) and (b), and 65.87(a) and (b), 65.109(b)(1) (formerly § 65.107(c)(1)), and 65.109(c) (formerly § 65.107(d)) to more accurately capture the intended privileges of the certificate.

2. Repairman Certificate (Light-Sport) Eligibility

a. General

Section 65.107, prior to the applicable effective date of this final rule, sets forth the eligibility, privileges, and limits to a repairman certificate (light-sport aircraft) to include a table establishing the general eligibility requirements to obtain a repairman certificate (light-sport aircraft), as well as the specific requirements to obtain an inspection rating and a maintenance rating on the repairman certificate. In the NPRM, FAA proposed to reorganize previous § 65.107 into two sections to improve readability and understanding of the requirements. Specifically, FAA proposed to amend, first, § 65.107 to include only the certificate eligibility and training course requirements for the repairman certificate (light-sport) and, second, to add new § 65.109 to set forth the certificate and rating (i.e., inspection, maintenance) privileges and limitations. FAA did not receive any comments regarding the proposed reorganization of the table into paragraphs and therefore the reorganization is adopted in the final rule. To note, the reorganization of § 65.107 will not, by itself, substantively change the eligibility requirements or process to obtain a light-sport repairman certificate.

As noted in the NPRM, § 65.107(a)(1)(ii), prior to the applicable effective date of this final rule, allows that, if a person is prevented from reading, speaking, writing, or

understanding English due to a medical reason, FAA may place a limitation on the repairman certificate, as necessary, to ensure safe performance of the actions authorized by the certificate and rating.[196] FAA explained that, in practice, this limitation is issued via an exemption in conjunction with the application and temporary airman certificate, as other part 65 certificates are treated; therefore, FAA proposed the removal of the limitation from restructured § 65.107 (specifically, § 65.107(b)(2) setting forth the language requirements). FAA did not receive comments on this change, therefore, in the final rule, FAA is adopting § 65.107(b)(2) as proposed.

b. Citizenship

In the NPRM, FAA proposed to move the repairman applicant citizenship requirements from § 65.107(a)(1)(iv) to § 65.107(b)(3). FAA received two comments stating concerns with retaining the requirement that a person must be a U.S. citizen, or a citizen of a foreign country who has been lawfully admitted for permanent residence in the United States, to be eligible for a light-sport repairman certificate. One of the commenters stated the requirement excludes persons who are legitimately in the United States on non-immigrant visas and who have a lawful reason to work. Both commenters suggested it is within the purview of U.S. immigration laws to provide pathways for individuals to legally work in the United States. In addition, both commenters stated requiring U.S. citizenship or permanent residency is inconsistent with the regulations for pilot, aircraft dispatcher, parachute rigger, and mechanic certificate eligibility and that such a requirement prevents qualified and otherwise eligible individuals from obtaining a light-sport repairman certificate.

FAA agrees with commenters and finds removing the citizenship requirement appropriate for the privileges associated with light-sport repairman certificates. As stated

by commenters, an applicant for a mechanic certificate does not have a similar requirement for citizenship or permanent residency.[197] Neither the 2004 final rule, nor the 2002 NPRM, that initially adopted the citizenship requirement for light-sport repairman applicants provided a rationale for adopting a citizenship requirement, nor does FAA find a safety basis for preventing this possible pool of repairman from becoming certificated. FAA notes that, while this final rule removes U.S. citizenship or lawful permanent residency as an eligibility requirement for a light-sport repairman certificate, all light-sport repairman must exercise the privileges of the certificate in compliance with all applicable laws and regulations of the United States. Therefore, in this final rule, FAA is removing the citizenship requirement in § 65.107 for repairman certificate (light-sport) eligibility.[198]

c. Demonstration of Requisite Skill

In the NPRM, FAA proposed to retain the requirement in § 65.107(a)(1)(iii) prior to the applicable effective date of this final rule, for a light-sport repairman certificate applicant to demonstrate the requisite skill to determine whether the aircraft is in a condition for safe operation, in proposed § 65.107(b)(4). Upon further review, FAA found this requirement to be unclear as to what satisfies a demonstration of skill requirement. In current practice and consistent with FAA guidance,[199] a person may accomplish this "demonstration" by presenting the certificate of completion issued by the training course provider. FAA finds no reason to perpetuate unclear "demonstration" in this final rule; rather, FAA finds demonstration of training completion and passing of the course test, is appropriate. Completion of a training course as required prior to the applicable effective date of this final rule,[200] is adopted in this final rule as § 65.107(b)(3).[201] Similarly, FAA proposed to add new § 65.107(b)(6), a requirement for

a written test to be administered by the training course provider, as is the practice of training courses prior to the applicable effective date of this final rule,[202] which this final rule adopts as § 65.107(b)(4).

Therefore, this final rule adopts the requirement to present documentary evidence of course completion and passage of the required written test for an applicant to demonstrate the applicant has the requisite skill. FAA also proposed to require training course providers to provide a certificate of completion to each student who completes the training course and passes the course test, in § 65.107(e)(3). A person may utilize this certificate of completion as the documentary evidence, though other documentary evidence, such as transcripts and a letter from the course provider confirming passage of the required written test, may also be appropriate.[203] This final rule does not adopt proposed § 65.107(b)(4) and, instead, FAA finds an applicant demonstrates they have the requisite skill to determine whether an aircraft is in a condition for safe flight by presenting the documentary evidence of training course completion and passage of the required written test as set forth in § 65.107(b)(5).

d. Changes to Repairman Certificate Privileges

In the NPRM, FAA discussed that aircraft class privileges issued prior to, and valid before a final rule takes effect, would be equivalent to category privileges of the same name.[204] FAA received five comments related to the eligibility of existing repairman certificate (light-sport aircraft) holders to hold and exercise the privileges of a repairman certificate (light-sport) after the effective date of a final rule. These commenters questioned how a final rule would affect repairman certificates issued before this final rule takes effect.

In the NPRM, FAA explicitly stated should the proposal be adopted, repairman certificates issued before the effective date specified in the final rule would be valid without additional training or reissuance to account for the broader scope of light-sport category aircraft characteristics, which FAA further explained would not result in a reduction in safety.[205]

As proposed in the NPRM, § 65.107(a) will set forth the ratings that may be issued on a light-sport repairman certificate: inspection and maintenance. The NPRM did not propose any changes to the ratings that may be issued on the certificate. However, as discussed in section IV.I.1 of this final rule, the changed certificate title will inadvertently result in the certificates issued before this final rule's applicable effective date being unrecognized in part 65.

While the NPRM explicitly discussed this, FAA finds that regulatory inclusion is needed to address this discrepancy. As such, this final rule adopts a new paragraph specifying that repairman certificates and ratings issued with "repairman certificate (light-sport aircraft)" before this final rule takes effect will remain valid, in § 65.107(f), setting forth certificate issuance and equivalency parameters. This principle was discussed in the NPRM preamble[206]; however, the plain text of the regulations would not have accounted for these certificates. Under this final rule, § 65.107(f)(2) will state that a repairman certificate (light-sport aircraft) that was issued before, and was valid on, [INSERT DATE 90 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER] is equivalent to a repairman certificate (light-sport) with the same ratings. New § 65.107(f)(3) will also state that aircraft class privileges issued before, and valid on [INSERT DATE 90 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER] are equivalent to aircraft category privileges, with an exception in

§ 65.107(f)(4) for certificates with gyroplane class privileges issued before [INSERT DATE 90 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER] (as subsequently discussed). For example, an individual's valid repairman certificate (light-sport aircraft) with an inspection rating and weight-shift-control class privileges will be recognized under § 65.107(f)(2) and treated equivalently as a repairman certificate (light-sport) with an inspection rating and weight-shift-control category privileges. Similarly, an individual's valid repairman certificate (light-sport aircraft) with a maintenance rating and airplane class privileges will be recognized under § 65.107(f)(3) and treated equivalently to a repairman certificate (light-sport) with a maintenance rating and airplane category privileges.

As discussed in section IV.I.8, a certificate with an inspection rating and gyroplane class privileges issued before the final rule takes effect will have rotorcraft category privileges that are limited to aircraft in the gyroplane class. Therefore, the exception in § 65.107(f)(4) states a repairman certificate (light-sport aircraft), with an inspection rating and gyroplane class privileges issued before and valid on [INSERT DATE 90 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER], is equivalent to a repairman certificate (light-sport), with an inspection rating, and rotorcraft category privileges that are limited to aircraft in the gyroplane class.

One commenter stated light-sport repairmen should be grandfathered into the new light-sport aircraft rules as fully functional and authorized mechanics. The commenter stated this would solve the current difficulty in finding mechanics for light-sport aircraft. FAA disagrees with the commenter; neither current nor future light-sport repairman certificate holders meet or will be required to meet the minimum knowledge and skills necessary to obtain a mechanic certificate. Though FAA proposed to use the Mechanic

General, Airframe, and Powerplant Mechanic Certification Standards (Mechanic ACS)[207] as a standard for training light-sport repairmen applicants, the proposed rule only required training that applies to a particular category of aircraft. The breadth and scope of mechanic training and, therefore, the breadth and scope of mechanic certificate privileges are much broader than just work completed on light-sport category aircraft or a single category or class of aircraft. FAA does not find implementing the commenter's suggestion would provide an equivalent level of safety.

3. Inspection Rating Training Requirements

Section 65.107(a)(2), prior to the applicable effective date of this final rule, sets forth the training requirements for a repairman certificate (light-sport aircraft) with an inspection rating. These requirements include: (1) meeting the general eligibility requirements of the section and (2) completing a 16-hour training course accepted by the Administrator on inspecting the category of experimental aircraft for which the person intends to exercise the privileges of the rating. FAA proposed to retain these training requirements for an inspection rating: the general eligibility requirements were proposed in § 65.107(b), while the training requirements were proposed in § 65.107(c) without revision. FAA received three comments but adopts § 65.107(c) as proposed (with minor editorial revision).

One commenter stated inspection rating training courses are mostly redundant regardless of aircraft type and proposed that a 4 to 8-hour abbreviated course should be considered for each additional type of aircraft after the 16-hour course has been completed for one specific category of aircraft.[208] Another commenter questioned why 16 hours of training is all that is required and asked how that compares to the requirements to obtain an inspection authorization on a mechanic certificate and perform essentially the

same function on a non-light-sport aircraft. One commenter asked that time requirements for courses be removed.

In the 2004 final rule preamble,[209] FAA explained the 16-hour inspection rating training course is designed to train an individual owner who does not have background in aviation maintenance or inspection to perform a satisfactory annual condition inspection on their experimental light-sport aircraft and, based on that inspection, make a determination if that aircraft is safe to fly. In the NPRM associated with this rulemaking, FAA did not propose substantive changes to the 16-hour inspection rating course requirement given the limited scope of privileges of the inspection rating (i.e., condition inspections only) compared to the broad scope of privileges of a maintenance rating (i.e., all inspections and maintenance), which correspondingly require a broader footprint of training.

FAA recognizes that inspection rating training courses may contain content that is applicable to multiple aircraft categories, as the commenter suggests. FAA notes the regulation does not limit how a training course provider structures its training so long as the training course is applicable to the category, and class as applicable, [210] of aircraft for which the person intends to exercise the privileges of the rating.

A training course provider may minimize duplication of course content by structuring its inspection rating courses in modules. For example, a training course provider could design a module on regulations and ASTM consensus standards that applies to all inspection rating courses and other modules with course content that provide training specific to the aircraft category, and class as applicable. In such a scenario, a person could complete a training course accepted by FAA that included the regulations and ASTM module and, if the person sought repairman privileges for another

category (or class) of aircraft, could be credited as already completing the regulations and ASTM module for the second training course, if the training course was structured and accepted by FAA in such a manner. When requesting FAA acceptance of the course(s), the course provider will have to define which modules make up an inspection rating training course for a particular aircraft category, and class as applicable, the hours assigned to each module, and the course content of each module. Furthermore, the regulation does not prevent course providers from accepting previously completed, verifiable training hours from an FAA-accepted training course toward the training necessary to add a rating or aircraft category privileges, or class limitations to those category privileges.[211] Therefore, this final rule adopts the parameters for inspection rating training courses in § 65.107(c): the training course must be at least 16 hours and must provide the student with the requisite skill to determine if aircraft in that category, and class as applicable, are in a condition for safe operation. For additional discussion on training course providers using training modules, refer to section IV.I.4e.

The requirements for obtaining an inspection authorization on a mechanic certificate should not be compared with the requirements for a light-sport repairman certificate inspection rating. These privileges are not necessarily comparable: an inspection authorization is only applicable to certain work[212] done on aircraft holding a standard airworthiness certificate, which is not a privilege afforded to light-sport repairmen. As detailed throughout this rulemaking, light-sport aircraft are placed lower on the safety continuum than aircraft holding standard airworthiness certificates. While the scope and detail of the annual and condition inspections may be similar, aircraft holding standard airworthiness certificates must have an annual inspection[213] conducted by the holder of an inspection authorization or an appropriately rated repair station.

FAA made a minor clarifying revision to the regulatory text from what was proposed in § 65.107(c) to remove "satisfactorily" as the qualifier to completing a 16-hour training course accepted by the Administrator. FAA removed "satisfactorily" because satisfactory completion of the training course is sufficiently determined by completing the training course and passing the written test, as now required in § 65.107(b)(3) and (b)(4).

4. Maintenance Rating Training Requirements and Incorporation by Reference

Section 65.107(a)(3), prior to the applicable effective date of this final rule, sets forth the training requirements for a repairman certificate (light-sport aircraft) with a maintenance rating. These requirements include: (1) meeting the general eligibility requirements of the section and (2) completing a training course acceptable to FAA on maintaining the particular class of light-sport aircraft for which the person intends to exercise the privileges of the rating. Section 65.107(a)(3)(ii) further set forth prescriptive hourly requirements for different aircraft privileges.[214] The maintenance rating training course ensures light-sport repairman certificate applicants have the knowledge and skills necessary to maintain light-sport category and certain experimental aircraft.[215] In the NPRM, FAA proposed to replace the prescriptive hours-based training requirements for obtaining a light-sport repairman certificate maintenance rating with a performance-based requirement in § 65.107(d). As proposed, the performance-based standard would require that the training include appropriate knowledge and skills applicable to the category of aircraft for which privileges are sought.[216] The performance-based standard would require maintenance rating training courses to include, at a minimum, the knowledge, risk management, and skill elements for each subject contained in the Mechanic ACS, as appropriate to the category of aircraft being taught.[217]

To note, FAA proposed a bifurcated approach to the maintenance training courses to ease the transition from prescriptive hour courses to performance-based courses. As discussed in the NPRM, FAA proposed to delay the compliance requirement for having a training course containing the knowledge, risk management, and skill elements of the Mechanic ACS. The proposal would have allowed for a 6-month compliance timeframe in proposed § 65.107(d)(1). FAA intended that, during that time period, both an hours-based training course (developed under regulations in effect prior to this final rule) or an ACS-based training course (developed under the proposed regulations) would be accepted by FAA for issuance of the maintenance rating on a repairman certificate (light-sport).

Instead of adopting the bifurcated approach, FAA adopts a framework providing training course providers additional flexibility as an outgrowth of comments received, which are subsequently discussed. While the means of FAA acceptance for maintenance rating training courses is shifting from an hours-based focus to a performance-based focus in this rulemaking, the content in the hours-based courses previously accepted by FAA continues to be accepted because those courses contained the required content to be accepted after this rulemaking and therefore do not need to be reviewed and accepted after this final rule is published. In addition, because all these training programs will meet the adopted regulations (i.e., the performance-based framework), FAA finds no need to adopt the proposed six-month delayed effective date to allow for training courses (other than glider training courses) to come into compliance with the regulation. Accordingly, proposed § 65.107(d)(1) is not adopted, and proposed § 65.107(d)(2) will be adopted as § 65.107(d).

Specifically, § 65.107(d) will adopt the performance-based training course requirement, requiring a person to complete a training course accepted by the Administrator that includes content on, at a minimum, the knowledge, risk management, and skill elements for each subject contained in the Aviation Mechanic General, Airframe, and Powerplant Airman Certification Standards (incorporated by reference, see § 65.23), that are appropriate to the category, and class as applicable, of aircraft for which the person intends to exercise the privileges of the rating. However, rather than permit prescriptive hours for up to six months after the effective date of the rule, as proposed, FAA finds that courses based on prescriptive hours and accepted by FAA prior to this final rule, with the exception of glider courses, already contain the course content appropriate to the category, and class as applicable, of aircraft for which the training is designed. Section IV.I.5 of this preamble discusses the removal of the proposed § 65.107(d)(1) in the context of glider training courses.

In 2022, the Mechanic ACS was incorporated by reference into part 65 as the testing standard for issuance of a mechanic certificate under part 65, subpart D.[218] Incorporation by reference is a mechanism that allows Federal agencies to comply with the requirements of the Administrative Procedure Act (APA) to publish rules in the *Federal Register* and the Code of Federal Regulations by referring to material published elsewhere. Material that is incorporated by reference has the same legal status as if it were published in full in the *Federal Register*. Because 5 U.S.C. 552(a) requires the Director of the Federal Register to approve material to be incorporated by reference, incorporation by reference is governed by the Office of the Federal Register and as promulgated in its regulations: 1 CFR 51. Specifically, 1 CFR 51 provides certain requirements that a regulatory incorporation by reference must contain. As a result of the

adoption of the Mechanic ACS as a standard under new § 65.107(d), FAA amends § 65.23(a)(3) to add § 65.107 in the referenced regulations for which the incorporation by reference of the Mechanic ACS applies. Section 552(a) of title 5, United States Code, requires that matter incorporated by reference be "reasonably available" as a condition of its eligibility. Further, 1 CFR 51.5(b)(2) requires that agencies seeking to incorporate material by reference discuss in the preamble of the final rule the ways that the material it incorporates by reference are reasonably available to interested parties, and how interested parties can obtain the material. In accordance with 5 U.S.C. 552(a) and 1 CFR 51, FAA makes the Mechanic ACS reasonably available to interested parties by providing free online public access to view or download the document from the FAA ACS website at: www.faa.gov/training_testing/testing/acs. For further information, contact the Training and Certification Group at 202-267-1100, acsptsinquiries@faa.gov, or 800 Independence Ave. S.W., Washington D.C. 20591.

This final rule subsequently summarizes and adjudicates comments received. In summary, FAA adopts proposed § 65.107(d) in the final rule: to obtain a maintenance rating on a repairman certificate (light-sport), a person will be required to complete a training course accepted by the Administrator that includes content on, at a minimum, the knowledge, risk management, and skill elements for each subject contained in the Mechanic ACS that are appropriate to the category, and class as applicable, of aircraft for which the person intends to exercise the privileges of the rating, with three minor additional changes. The changes clarify regulatory text and do not add any requirements not already proposed or intended in the NPRM.

First, FAA is adding the language "content on" in the requirement to provide a training course, to clarify that an FAA-accepted training course defines content, and is

not simply a copy of applicable knowledge, risk management, and skill elements of the Mechanic ACS verbatim. FAA points out this additional language does not change the intent of the proposed rule because the term, course content, was used in various locations throughout the proposed § 65.107.[219] In addition, the intent of proposed § 65.107(d) for a training course to include course content was set forth in draft AC 65-32B, posted to the rulemaking docket with the NPRM, and evidenced in the sample maintenance rating training course content in appendix B of the Advisory Circular.

Second, FAA is adding the words "that are" prior to "appropriate" in § 65.107(d), to facilitate a plain language reading of the requirement for determining what knowledge, risk management, and skill elements of the mechanic ACS must be included in a maintenance rating training course. Specifically, only those elements that are appropriate to the category, and class as applicable, of aircraft for which the person intends to exercise the privileges of the rating must be included in the maintenance rating training course.

Third, FAA removed "satisfactorily" as the qualifier to completing the FAA-accepted maintenance training course required in § 65.107(d). FAA removed "satisfactorily" because satisfactory completion of the training course is sufficiently determined by completing the training course and passage of a written test, as specified in § 65.107(b)(3) and (b)(4).

In response to the proposed changes to light-sport repairman certificate training requirements, FAA received comments from approximately 150 different associations and individual commenters. Though several commenters provided positive feedback, most comments were against the proposed changes to maintenance rating training courses. Within those comments, FAA identified the following commenter concerns:

a. The proposed rule is incomplete, unclear, or otherwise not justified.

b. The proposed rule adds time and cost on light-sport repairman applicants.

c. The proposed rule does not address the expanding scope of aircraft design that light-sport repairmen could maintain and approve for return to service.

d. FAA should use a system of endorsements or aircraft type ratings to further define light-sport repairman certificate privileges.

e. Training courses should use modules to deliver required training and for training on design features of more complex light-sport category aircraft.

FAA adjudicates commenters' concerns in the subsequent sections. Nonetheless, this final rule amends the maintenance rating training course standard from the prescriptive hours-based requirement to a performance-based standard based on the Mechanic ACS.

a. Comments Stating the Proposed Rule is Incomplete, Unclear, or Otherwise Not Justified

Several commenters stated FAA did not provide a justification of the proposed changes or the proposal was unclear, vague, or not well thought out. FAA disagrees with commenters that the proposed rule was unclear or vague. FAA's review of comments found most of the answers to questions and comments were addressed sufficiently in the NPRM[220] or in the draft AC 65-32B[221].

Several commenters stated the proposed changes to maintenance rating training courses are not necessary because the existing training courses already provide the intended outcome of providing the necessary knowledge and skills for working on light-sport category aircraft. Commenters referred to the accident data in the NPRM to argue there is no justification to revise the maintenance training course standard.

When drafting the initial repairman certificate (light-sport aircraft) regulations for the original light-sport aircraft rulemaking, FAA initially proposed an 80-hour training course for maintenance rating privileges for any class of aircraft.[222] However, in the resulting final rule, FAA implemented varied training hour requirements, depending on aircraft class, after finding different training hours were required to address distinct knowledge elements due to characteristic and performance differences between those classes of aircraft. Though the general reasons for additional course hours for certain classes of aircraft were discussed in the 2004 final rule, no methodology was discussed on how FAA decided on the baseline 80 course hours initially proposed or the specific hours adopted in the 2004 final rule.

In drafting the NPRM, FAA considered recent rulemaking for part 147, which sets forth the regulations governing the training requirements for mechanics. It is important to note that the part 147 rulemaking[223], which incorporated the Mechanic ACS by reference into the training requirements in § 147.17, was pursuant to a Congressional mandate[224] requiring the training of mechanics to align with the entire content of the Mechanic ACS. FAA has consistently expected that an applicant must be able to demonstrate a minimum level of knowledge and skill, with respect to the certificate's privileges,[225] to be issued any type of FAA certificate. This intent is, likewise, evident in the 2002 NPRM[226] and the 2004 final rule preamble that discussed training courses, training course hours, and the skills necessary to maintain the different classes of aircraft. However, the prescriptive requirement, on its face in the regulations, did not accurately reflect the expectation that an applicant be trained and evaluated on knowledge and skills appropriate to the category, and class as applicable, of aircraft for which the person intends to exercise the privileges of the certificate and rating.

When drafting the NPRM, FAA decided that rather than continue requiring prescriptive course hours, a performance-based standard for course content based on necessary knowledge and skill would provide an improved training standard. The transition to a performance-based course retains the intent of the prescriptive-hours requirement by ensuring applicants complete course content on the necessary knowledge and skill, while removing the required prescriptive-hours approach. The performance-based approach gives course content providers flexibility to determine the appropriate time necessary to deliver course content to prepare applicants for their duties and privileges under a light-sport repairman certificate with a maintenance rating.

The performance-based standard provides applicants and training course providers with a regulatory standard for the knowledge, risk management, and skill elements that will be used to determine the training content an applicant must be taught. Importantly, the standard also requires the training content to be appropriately tailored to the category, and class as applicable, of aircraft for which the applicant is seeking privileges. FAA emphasizes intentional language in the regulation tailoring the training course content an applicant must complete to the elements for each subject appropriate to the category, and class as applicable, of aircraft. Therefore, an applicant must only complete, and a training course provider is only required to provide, content on the knowledge, risk management, and skill elements that apply to the category, and class as applicable, of aircraft privileges sought; in other words, a training provider does not have to provide training on all elements of all subjects within the Mechanic ACS if the element does not apply to that category, and class as applicable, of aircraft. Entire subject areas may not be applicable, while other subject areas may have some or all elements being applicable. For example, for airplane category training, the Mechanic ACS section III.

Powerplant, subject area B. Turbine Engines, may not be applicable until there are light-sport category aircraft operating in the NAS with turbine engines. Under the Mechanic ACS Section I. General, subject area F. Ground Operations and Servicing, training courses could exclude those knowledge, risk, and skill elements not typically applicable to light-sport category aircraft operating in the NAS, such as oxygen system servicing, or deicing servicing procedures.

The draft AC 65-32B[227] provided a sample[228] of training course content that would be acceptable to FAA under the proposed performance-based training requirement. This sample demonstrates that the new regulation will provide training course providers flexibility in tailoring their courses, rather than imposing additional requirements or burden. Importantly, draft AC 65-32B identified the training course content that was used to accept courses under the hours-based training requirement, included in AC 65-32A, to then show what will be acceptable under the performance-based training requirement (i.e., what the overlapping footprint will be for currently operating training providers). The AC illustrates a method of compliance[229] for providing the appropriate training course content (i.e., the applicable knowledge, risk management, and skill elements for each subject contained in the Mechanic ACS) that will be acceptable to FAA under adopted § 65.107(d). As demonstrated in the AC, the training course content that was appropriate under the hours-based requirement should substantively correlate to the same content under the ACS-based training standard, except for glider class courses, which are further discussed in section IV.I.5.

FAA acknowledges commenters' concerns that the term "appropriate" (defining the elements and subject areas applicable to the category of aircraft the person intends to exercise the privileges of the rating) may result in a standard that could be applied

differently, especially over time. While the Mechanic ACS is the overarching standard, FAA retains the authority to update the regulations over time as safety demands, which may result in changes to what constitutes "appropriate." FAA will consider the following three guidelines[230] when providing training course acceptance,[231] and training course providers should use these guidelines in deciding the appropriate course content, initially based on the Mechanic ACS, for each maintenance rating training course.

First, appropriate content can only be determined by considering the certificate and certificate privileges for which the training is designed. This means that for any given applicable subject area or element in the Mechanic ACS, the course content must have appropriate information on topics that are relevant to the aircraft for which an applicant seeks a certificate and accompanying privileges. Second, a determination of what constitutes appropriate course content should consider the designs and configurations of aircraft operating in the NAS for which light-sport repairmen will be expected to perform maintenance on and approve for return to service. It would be unreasonable for training course providers to develop course content and train (and repairman applicants to learn) about potential light-sport category aircraft designs that may never exist or never be operated in the NAS. For example, light-sport category aircraft are no longer limited to using a single reciprocating engine; however, it remains to be seen if multi- or turbine engine light-sport category designs will operate in the NAS. As such, light-sport repairman training courses do not need to train on multi- or turbine engine light-sport category aircraft until such time that multi- or turbine engine light-sport category aircraft exist and operate in the NAS. Third, appropriate course content should be based on those tasks that the majority of repairmen will be expected to conduct or that a newly certificated light-sport repairman would be expected to perform. The knowledge, risk

management, and skill elements in the Mechanic ACS set forth the foundational knowledge and skills a mechanic or repairman could encounter while performing aircraft maintenance work. Taken together, with the additional guidance and sample course content provided in the AC, FAA does not find the modifier of "appropriate" to be ambiguous, arbitrary, or burdensome.

One commenter noted that, while FAA's proposal does not directly suggest the maintenance rating training requirement would increase, aligning current courses to the Mechanic ACS would almost certainly require increased training. The commenter further added that, by leaving the range of potentially acceptable training curricula entirely unclear, FAA fails to adhere to the requirement of the APA to allow for comment, as the potential scope of the resulting requirements for the issuance of the certificate are so broad as to inhibit their ability to meaningfully comment.

As discussed previously, aircraft owners, operators, the light-sport industry, and FAA cannot foresee exactly which aircraft designs will be viable, produced under these new regulations, and ultimately operate in the NAS in numbers that warrant revisions to light-sport repairman training requirements. As those aircraft increasingly operate in the NAS, the appropriate training should evolve to include those aircraft designs as necessary, and FAA may conduct future rulemaking to address any safety concerns. It is possible that maintenance rating training course content that is appropriate today, and subsequently accepted by FAA, could at some point in the future be found to no longer contain appropriate content and create a substantial safety risk. Should this occur, FAA will work with training course providers to address safety issues and follow its policy[232] on rescinding its FAA acceptance if those issues are not addressed.

However, all documents incorporated by reference are regulatory and, therefore, must go through notice and comment rulemaking.[233] FAA finds the regulated community has had two opportunities to comment on the Mechanic ACS. First, FAA incorporated by reference the Mechanic ACS with notice and comment rulemaking during the Aviation Maintenance Technician School (AMTS) interim final rule.[234] In addition, FAA provided notice in the NPRM for this rulemaking through a detailed explanation on the proposed use of the Mechanic ACS in the regulation as a basis for a repairman training course for a maintenance rating. FAA also notes that, in addition to the first comment period (dated July 24, 2023, through October 23, 2023), the NPRM was extended to allow the opportunity for public comment on the NPRM and associated documents in the docket (dated October 23, 2023, through January 22, 2024). FAA provided a draft of AC 65-32 in the docket with the NPRM, so the public had the same opportunity to comment on the illustration and implementation of performance-based course content based on the revised Advisory Circular. As such, FAA has fulfilled its obligations under the APA of providing notice and opportunity to comment specific to the content of the Mechanic ACS and for the use of the Mechanic ACS as the basis for repairman training course content. FAA will continue to adhere to the required notice and comment procedures for any revisions to the Mechanic ACS.

b. Comments Stating the Proposed Rule Adds Time and Cost for Light-Sport Repairman Applicants

Numerous commenters, including a training course provider with multiple FAA-accepted training courses, stated eliminating the current maintenance rating training course standards would dramatically increase the time and expense needed to obtain a light-sport repairman certificate with a maintenance rating. Some commenters suggested

that the proposed changes would disrupt existing training programs or increase time and cost burden, exacerbating the shortage of qualified personnel necessary to maintain and inspect these aircraft and decreasing the safety of the fleet and aviation safety overall. Some commenters asserted the proposed rule would require light-sport repairman applicants to have the same training as a mechanic certificate applicant. In sum, most commenters stated, as evidenced by FAA light-sport category aircraft data, maintenance rating training courses accepted by FAA prior to this rulemaking provided the appropriate training, and these commenters suggested there is no reason to change the training course regulations.

FAA agrees a substantial decrease in light-sport repairmen could negatively impact the safety of the aircraft that are inspected or maintained by light-sport repairmen. FAA does not find the final rule will increase the time or cost to applicants for a light-sport repairman certificate; however, FAA understands commenters perceived the proposal as including more stringent requirements. First, FAA will not require light-sport repairman applicants to complete training to the same extent as for mechanic applicants. Second, repairman training courses accepted prior to the applicable effective date of this final rule, with the exception of courses specific to glider category as specified in section IV.I.5, will remain valid following the implementation of this final rule.

First, FAA's intent is not to require light-sport repairmen applicants to undergo the same training as mechanic applicants attending a part 147 AMTS. While the Mechanic ACS standard provides a regulatory basis for training content, the actual course content in a repairman course is, and will continue under this final rule to be, less than that required for mechanic training, which corresponds with the spectrum of privileges afforded on each certificate, respectively. A light-sport repairman maintenance rating

training course will only be required to teach content on those knowledge, risk, and skill elements that are appropriate to the category, and class as applicable, of aircraft for which privileges are sought. Light-sport repairman certificate privileges and limitations are set forth in § 65.109; therefore, any determination by course providers of "appropriate" Mechanic ACS subjects and elements and resulting course content must consider the overall privileges of the repairman certificate and appropriate[235] content tailored to the aircraft category or class. Conversely, AMTS course content requires content related to every knowledge, risk, and skill element in the Mechanic ACS be taught in a broad enough manner that reflects the privileges of a mechanic certificate. Therefore, the training footprint for a repairman certificate with maintenance rating will be less than that of the mechanic certificate.

Second, after consideration of comments to the NPRM, FAA agrees with commenters that existing training course content (delivered within prescriptive hours) achieves the necessary knowledge and skill to be issued a light-sport repairman certificate, with the exception of glider training courses accepted prior to this final rule taking effect.[236] As discussed in the NPRM,[237] FAA foresees the hours that maintenance rating course providers are required to design their courses to under the existing regulations will be similar to the hours training course providers would include in new/revised courses because those courses should already be teaching students the necessary information on how to maintain their category, or class as appropriate, of aircraft. Under this final rule, training course providers will be free to maintain their training course hour minimums; FAA is simply removing the prescriptive hours requirement in recognizing that training course providers are in the best position to determine the appropriate duration of course work to achieve student proficiency. For

example, a repairman certificate (light-sport) maintenance rating training course provider with a 120-hour airplane category privilege course may continuing offering the 120-hour course, as long as the course contains the appropriate knowledge, risk management, and skill elements from the Mechanic ACS that pertain to the airplane category privilege. Conversely, the training course provider may determine that these ends can be achieved by removing or adding course hours, which could be facilitated under this final rule with FAA acceptance.

One commenter stated moving to a competency-based process is good news for individuals with significant maintenance, engineering, or building experience outside of formal, traditional hours-based mechanic training. Under this final rule, training course providers will have the ability to increase or decrease the course hours, as long as the course provides the appropriate content; however, FAA clarifies, contrary to this comment, that the standard is not solely a competency-based standard. Applicants for a light-sport repairman certificate are still required to complete an FAA-accepted training course that meets the regulatory parameters specified in § 65.107. Training course providers should not solely contemplate a student's previous knowledge or experience for the purpose of issuing credit toward their FAA-accepted course.

In summary, FAA is adopting the performance-based standard for maintenance rating training courses as proposed. FAA disagrees with commenters that replacing the hour-based prescriptive training course standard with a performance-based training course standard will result in an increase in the time or expense necessary to complete a maintenance rating training course and obtain a light-sport repairman certificate compared to the requirements prior to this final rule taking effect. Consequently, FAA does not find a basis to commenters' assertions that the performance-based training

course standard will result in less light-sport repairman certificate holders, nor does FAA find any basis for an alleged decrease in safety associated with a decline resulting from increased training burden.

c. Comments Stating the Proposed Rule Does Not Address the Expanding Scope of Aircraft Design That Light-Sport Repairmen Could Maintain and Approve for Return to Service

AEA/ARSA stated the extensive expansion of size, speed, and complexity of light-sport aircraft and the expanded flight training and aerial work operations of these aircraft as proposed were not considered when the light-sport repairman certificate was established in 2004; however, AEA/ARSA did not recommend any changes or considerations specific to this rulemaking in this context. In developing the proposed changes to light-sport repairmen requirements in this rulemaking, FAA did consider the potential for the expansion of aircraft size, speed, complexity, and operations that this final rule will allow. While most commenters to the light-sport repairman proposal argued the added training burden is not necessary, many of those same commenters suggested that FAA should mandate additional training or experience using ratings or endorsements. These comments suggest that commenters recognized additional training or experience may be necessary for light-sport repairmen before approving for return to service those aircraft having design features of which the certificate holder does not have knowledge or skills.

Until such time as aircraft in the new aircraft categories and with new design features are issued light-sport category airworthiness certificates and are operating in the NAS, it would be unreasonable to mandate additional training for all possible design features for obtaining a light-sport repairman certificate. By virtue of defining sets of

aircraft based on similar characteristics through category and class, which has long been FAA's framework, it is unreasonable to capture every unique design feature that may vary from aircraft to aircraft. For example, rotorcraft-helicopters are captured under a common class of aircraft without a requirement that a person have specific training on a two-blade rotor system if working on a helicopter with two blades or a three-blade rotor system if working on a helicopter with three blades (etc.). Rather, FAA finds the training framework set forth in the mechanic ACS sufficiently addresses the commonality in design, size, speed, and complexity of the expanded light-sport category aircraft. Further, FAA points to related requirements for both mechanics[238] and light-sport repairmen with a maintenance rating[239] that prohibit those certificate holders from exercising the privileges of their certificate if the individual has a lack of knowledge or skill, relative to the work the certificate holder intends to perform. These requirements serve as a safety mitigation to ensure an aircraft may only be approved for return to service by a certificate holder who is not only appropriately rated, but who also has previously done that work satisfactorily.[240]

AEA/ARSA also asserted the proposed expansion of authority of the light-sport repairman is discriminatory and creates an uneven playing field for aircraft maintenance service technicians. The commenters stated if FAA has determined that the limited knowledge, skills, and abilities as described in draft AC 65-32B, Certification of Repairmen (Light-Sport), are a safety limit considering the size, complexity, and operations of the new light-sport aircraft, then FAA must reconsider the knowledge standards and experience requirements for certification of mechanics under §§ 65.75 and 65.77, Knowledge requirements, and repairman, § 65.101.

FAA interprets AEA/ARSA's comment to imply that, because the light-sport repairman training standard is now based on the Mechanic ACS, a light-sport repairman can do the same work as a mechanic, and the mechanic certification process unnecessarily requires more training to earn the same privileges a light-sport repairman is permitted. The maintenance rating training course content in AC 65-32B contains examples of minimum course content that would be found acceptable to FAA for light-sport repairman training. While determining appropriate course content is based in part on the privileges and limitations that an airman would have once issued a certificate, that course content does not equate to privileges or limitations of a light-sport repairman certificate. Privileges and limitations are set forth in § 65.109. To be clear, the required training for a light-sport repairman certificate must only be appropriate to the privileges afforded by the certificate. As such, the mechanic training is more comprehensive than training for a light-sport repairman certificate because mechanic certificates afford more privileges. Furthermore, the privileges afforded a light-sport repairman with a maintenance rating in new § 65.109 (§ 65.107 prior to this final rule taking effect), do not limit, and have never limited those certificate holders by the aviation work and tasks that may be performed (with the exception of meeting those additional requirements in § 65.109(c) previously discussed). Instead, light-sport repairmen are, and always have been, limited based on the airworthiness certificate issued to the aircraft and the category, and class as applicable, of aircraft on which the certificate holder has demonstrated the requisite knowledge and skill. The specific work tasks a light-sport repairman can perform are not limited; rather, light-sport repairmen are limited as to the aircraft on which work can be performed.

One commenter stated the Mechanic ACS was written without light-sport aircraft in mind. FAA disagrees; the purpose of the Mechanic ACS is to ensure mechanic applicants have the broad-scope foundational and essential knowledge and skills necessary to exercise the privileges of a mechanic certificate once certificated. Those certificate privileges include conducting maintenance (including inspections and repairs) and alterations on light-sport category aircraft. FAA maintains that mechanic training designed to meet the Mechanic ACS would be required to include training to support privileges to perform maintenance on light-sport category aircraft, the light-sport repairman certificate simply limits that work to certain kinds of aircraft.

To note, the knowledge, risk, and skill elements in the Mechanic ACS may not be equivalent to course content when comparing between a repairman training course and a mechanic training course, largely due to the training footprint required for the associated privileges of each certificate. Some elements in the Mechanic ACS address specific knowledge, and other elements require understanding or skill to a broader degree. As a hypothetical, mechanic applicants would typically learn about airships by way of structures, fabric, engines, (in general) and a light-sport repairman airship training course would contain specific content based on the airship consensus standard (upon inception). Particularly in elements related to certificate privileges and regulations, it is implied in the language of the element that the training would include course content related to light-sport category aircraft. For example, elements AM.I.I.K1 and AM.I.I.K8 require that an applicant must demonstrate understanding of the privileges and limitations of a mechanic certificate and the regulatory framework, including general subject matter of the parts of 14 CFR relevant to aircraft maintenance and mechanics.

That said, just because a subject area in the Mechanic ACS uses the term "mechanic," this does not conclusively mean that it is inapplicable to repairmen. When using the Mechanic ACS as a training course standard for light-sport repairman training, where the Mechanic ACS specifically refers to "mechanics," it may be appropriate to include that same content in a light-sport repairman training course in the context of light-sport aircraft, as the repairman training course is for a maintenance rating. For example, in the element AM.I.I.K8, it would be appropriate for maintenance rating training courses to include content on the regulatory framework, including general subject matter of the parts of 14 CFR relevant to aircraft maintenance and light-sport repairman certificate holders, even though AM.I.I.K8 specifically states "[t]he regulatory framework, including general subject matter of the parts of 14 CFR relevant to aircraft maintenance and mechanics."

One commenter recommended FAA develop a separate ACS applicable to light-sport category aircraft. Another commenter suggested that FAA create separate ACS for each endorsement-based training module within the maintenance rating training course. At this time, FAA is not considering developing a separate ACS for light-sport category aircraft. Light-sport repairmen and mechanics perform the exact same work, though light-sport repairmen are limited as to which aircraft that work may be performed on. If FAA were to develop an ACS specific to light-sport category aircraft, such an ACS would be almost identical to the Mechanic ACS with minor exceptions, particularly considering the expanded design and performance specifications that could exist in the various categories (airplane, rotorcraft, powered-lift, etc.) in light-sport category aircraft under this final rule. Therefore, FAA finds it would be neither efficient nor streamlined to create separate ACSs. Relatedly, FAA did not propose an endorsement based-training option and is not

adding regulations to support an endorsement system for light-sport repairman certification. AC 65-32 contains information on the development of training courses, but it is not necessary to create a separate ACS for each training module, and maintains the Mechanic ACS adequately covers the minimum standard required for light-sport repairman certification.

Some commenters suggested that when maintenance is performed on a light-sport category aircraft, it is performed differently than the same work done on an aircraft certificated in another category and suggested it would not be appropriate to use the Mechanic ACS as a training standard because the ACS would not apply. FAA disagrees since the maintenance requirements of part 43 apply to light-sport category aircraft, as defined in part 43 and § 91.327. One commenter stated the differences between maintaining light-sport category aircraft and type-certificated aircraft warrant different training standards. FAA assumes the commenter is referring to the consensus standards to which light-sport category aircraft are designed as being the difference in maintaining these aircraft comparative to type-certificated aircraft. Many commenters seemed to equate the consensus standards on which light-sport category are designed with standards for performing maintenance. There could be multiple consensus standards accepted by FAA for the design of a particular category of light-sport aircraft, just as there are many aircraft design standards[241] for other categories of aircraft. While some elements of the Mechanic ACS focus on knowledge of regulations and the significance of the design standard, the ACS does not require specific knowledge of the design standards themselves. Most of the elements in the Mechanic ACS require knowledge and skill on the techniques for maintenance, inspection, repair, and alteration that will be used to ensure the aircraft will continue to meet that design standard over its operational life. As

previously discussed, FAA acknowledges there will be differences in training course content for mechanics and light-sport repairmen applicants. Nonetheless, the Mechanic ACS provides a standard for determining what those course content differences should be and intends to provide repairmen applicants (and mechanic applicants) with foundational knowledge and skill to then apply to different aircraft within a category (and class if applicable).

Some commenters stated light-sport aircraft have distinct standards for maintenance manuals, which offer detailed instructions specific to each aircraft, and contrasted the specificity in maintenance manuals with the broad privileges granted by mechanic certificates based on general training. FAA interprets these comments to imply the commenters are stating light-sport repairman certificate training should be different from mechanic training because of maintenance manual standards. Light-sport repairman certificate privileges are not based on an aircraft's maintenance manual content; therefore, maintenance manual standards are not a consideration when determining training requirements. The Mechanic ACS includes knowledge, risk, and skill elements on the use of manufacturer maintenance manuals, which would be requisite training for a light-sport repairman maintenance rating course, under subject area I. Regulations, Maintenance Forms, Records, and Publications.

d. Comments Stating FAA Should Use a System of Endorsements or Aircraft Type Ratings to Further Define Light-Sport Repairman Certificate Privileges

AEA/ARSA recommended the light-sport repairman certificate maintenance rating be revised to require that a repairman be type-rated on the aircraft the repairman is authorized to maintain. Several other commenters also recommended that FAA establish a certification system involving aircraft type ratings or endorsements, similar to how

certificate privileges are identified for pilots, to identify the specific privileges and limitations of a light-sport repairman certificate maintenance rating. Several of these commenters implied that a system of endorsements would be less burdensome than what was proposed in the NPRM.

FAA disagrees with the commenters that creating a system of endorsement or aircraft type ratings would be less burdensome than what was proposed since this rulemaking does not increase training burden in any way from what was required prior to this final rule taking effect. FAA also disagrees with establishing a system of endorsements for recording a light-sport repairman's experience in performing certain work. Rather, FAA finds a type or endorsement system to be more burdensome, as a person would have to seek training and the endorsement for each specific aircraft they would seek to perform work on rather than have the privilege of performing work on any aircraft within the category (and class if applicable). To develop such an endorsement requirement, FAA would also need to revise the regulations to add a recordkeeping requirement, develop and add an endorsement framework, and establish instructor requirements to provide such training. Again, the maintenance rating limitations formerly in § 65.107(c) have proven effective in ensuring the safety of light-sport category aircraft maintenance where there may be an initial gap in knowledge of an aircraft within the category (and class if applicable) and have been recodified in § 65.109(c).[242] Furthermore, FAA did not consider establishing endorsements for repairman certificates in this rulemaking and such a change (which would require input on the aforementioned regulatory parameters) is therefore outside the scope of this rulemaking.

e. Comments Stating Training Courses Should Use Modules to Deliver Required Training and for Training on Design Features of More Complex Light-Sport Category Aircraft

EAA, AOPA, NATA, NBAA, and many other commenters commented that the current maintenance rating training courses can be supplemented by additional modules appropriate to these new aircraft, components, and technologies.

FAA notes the regulation does not limit how a training course provider structures its training and agrees that training course providers have the option to structure their inspection rating and maintenance rating training courses using modules. However, as proposed and adopted in this final rule, the courses must include the appropriate course content aligned with the Mechanic ACS, as applicable.[243] FAA will only accept an FAA course when the course provider can demonstrate to FAA that the course includes all required training applicable to the rating and category, and class as applicable, as well as privileges for which the course is designed. In the draft AC 65-32B, FAA suggested training course content could be provided in module format if the course provider chose to set the training course up in that manner; however, the draft AC suggested that course providers could choose other course designs.

EAA, AOPA, NATA, and NBAA stated additional training modules could be offered by the original training course provider, the aircraft or component manufacturer, or anyone equipped to offer this training. Under EAA, AOPA, NATA, and NBAA's proposed framework, they stated a light-sport repairman would need to show completion of these course modules before performing maintenance on applicable aircraft. First, FAA agrees that any of these entities listed by the commenters would be able to submit training courses for FAA-acceptance and subsequently deliver training that meets the requirements of § 65.107, as adopted in this final rule. Unlike part 147 AMTS requirements for training on obtaining a mechanic certificate, which require a person to successfully complete a part 147 certificated AMTS curriculum (if not applying for a

mechanic certificate on the basis of practical experience), FAA does not place air agency certification requirements on training providers of light-sport repairman training courses. However, the training course must be an entire course, not just an added module by separate providers, as the training course as a whole must be FAA-accepted and deemed to meet the requirements of revised § 65.107 (e.g., contain the appropriate content from the Mechanic ACS). For example, a person could not take 75% of a training course at one provider and then take individual modules at a second provider to result in an entire training course.

Second, the requirement that inspection and maintenance rating training courses be FAA-accepted does not prevent a training course provider from developing additional training courses on topics beyond the minimum certification standard and offering those courses as add-on training. However, such additional training is not required for an applicant to be eligible for a light-sport repairman certificate and the applicant is not required to show completion of these course modules before performing maintenance on applicable aircraft. While not required for eligibility, attending additional training is always encouraged and may be one way to meet § 65.109(c), depending on the specific training provided.[244]

Another commenter stated there is no discussion in the proposed rule of add-on courses and asked how a current certificate holder would add additional categories of aircraft to their certificate, such as rotorcraft and powered-lift, and how the modular concept would work with these new skill-based courses. Training course providers will be responsible for developing training courses for any new aircraft category, and class as applicable, privileges that would be allowed under this final rule. It is permissible for a training course provider to use existing course modules as a portion of a new FAA-

accepted training course. AC 65-32 provides information on how a training course provider could request a new course acceptance using modules that may be included as part of another training course.

For example, a training provider could develop a module specific to the certificate privileges of light-sport repairmen, which would be applicable to every FAA-accepted training course the training provider offers. Then, the training course provider could credit a student with previous completion of that training module if the training course provider could verify the student had already completed that training; in this case, the student would then not have to retake that training module. However, the student must still complete and pass a written test administered by the training course provider that covers the contents of the course, to include all course modules including the module on certificate privileges, before being issued a certificate of completion for that training course.

One commenter emphasized that allowing online course work would help in making additional training available for maintenance topics not covered in the base repairman training. Just as the regulations do not restrict training course providers from providing additional training course content, the regulations do not prescribe a delivery method. Therefore, a training course provider could use online delivery for some of the training within an FAA-accepted courses. Training course providers should review the ACS standards for elements that require students to demonstrate skill, for which training on those skills, with very few limited exceptions, is best suited to hands-on, in-person learning with a qualified instructor.

5. Training Course Revision for Gliders: Delayed Compliance

As a result of the proposed change to training course standards for the maintenance rating (i.e., from prescriptive hours to performance based), the NPRM discussed that existing course providers would need to review their existing training courses to determine if those courses include the appropriate knowledge, risk management, and skill elements from the Mechanic ACS. Furthermore, the NPRM discussed that if course revision is necessary, the course provider would have to submit the revised course to FAA for acceptance. To allow for a transition period between the current and proposed training standards, FAA proposed in § 65.107(d)(1) to retain the prescriptive hour requirements for 6 months. The NPRM discussed that during that 6-month timeframe, either an hours-based training course or a performance standard ACS-based training course (developed under the proposed and adopted regulations) would be accepted by FAA for issuance of the maintenance rating on a light-sport repairman certificate.

As discussed in section IV.I.4.a, FAA surveyed the existing FAA-accepted maintenance training courses and determined that each training course, with the exception of the glider courses previously discussed, already include course content that covers the knowledge, risk management, and skill elements contained in the Mechanic ACS appropriate to the category of aircraft on which the training applies.[245] However, upon review of the glider training courses, FAA identified two FAA-accepted glider class training courses, including one 16-hour glider class inspection rating course[246] and one 80-hour glider class maintenance rating course, that only include content on unpowered gliders.[247] FAA does not distinguish powered and unpowered gliders as different classes of aircraft within the glider category[248] and does not issue light-sport repairman certificate limitations based on aircraft design features alone. Because the glider category

of aircraft includes both powered and unpowered gliders, FAA determined each training course for gliders should cover both powered and unpowered gliders, which will be required via the Mechanic ACS through an applicable powerplant subject area.[249] To ensure training course operators have ample time to add this content, and for FAA to accept the revised training course, this final rule more narrowly scopes the delayed compliance language from that originally proposed into new § 65.107(g), which will only apply to glider training courses. Section 65.107(g) will apply to both the maintenance rating course (as proposed in the NPRM) and adds the inspection rating course for glider category. Further, this final rule extends the proposed 6 month delayed effectivity to a one-year effectivity. Therefore, two glider-specific training courses (accepted by FAA prior to this final rule) will have one year to integrate both powered and unpowered training topics into their course content and all new glider-specific training courses must include applicable course content for both powered and unpowered gliders upon submission for FAA-acceptance.

Glider training courses accepted by FAA prior to [INSERT DATE 90 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER], may be offered until [INSERT DATE 365 DAYS AFTER PUBLICATION OF FINAL RULE].[250] After that date, the course may not be offered, but individuals who have completed the course prior to that date will still be eligible for a light-sport repairman certificate with glider category privileges if all eligibility requirements in § 65.107 are met because course completion certificates do not expire. At the time of this final rule, there are approximately 11 light-sport repairmen issued an inspection rating and 141 light-sport repairmen issued a maintenance rating, with glider class privileges issued before the publication of this final rule. These repairman certificates were not originally issued with

a powered or unpowered differentiation; however, these repairmen hold glider category privileges for both unpowered and powered gliders, consistent with § 65.107(f), Certificate issuance and equivalency, and § 65.109.[251]

6. Training Course Exams

As mentioned previously, FAA proposed to add a requirement as § 65.107(b)(6) for an applicant for a light-sport repairman certificate, for either an inspection or maintenance rating, to pass a written test administered by the training course provider that covers the content of the training course. Prior to [INSERT DATE 90 DAYS AFTER FINAL RULE PUBLICATION], FAA guidance specified that training course providers submit a course test, along with their training course, as part of the training course package for FAA review and acceptance.[252] Furthermore, guidance specified that the training course include a final course test, for which the student must achieve an 80 percent or higher to be considered as having successfully completed the course. FAA proposed to codify the requirement that students pass a test on the course content with a minimum passing grade of 70 percent as required by § 65.17. As explained in the NPRM, the proposal aligned with a historical NTSB position, suggesting FAA implement a testing requirement. Further, FAA finds testing is an essential step in the airman certification process as a proficiency determination. Therefore, while FAA received several comments opposing the testing requirement as subsequently discussed, this final rule adopts the requirement for an applicant to pass a written test administered by the training course provider that covers the contents of the maintenance or inspection training course as applicable to the rating sought, in § 65.107(b)(4). As discussed in the NPRM, there is no need to restate a minimum passing grade in § 65.107 because the minimum passing grade requirement (70 percent) specified in § 65.17(b) applies to all tests

administered under part 65 and therefore will apply to the written test required by § 65.107(b)(4). FAA will continue to require submission of a course test covering the contents of the course at the time of course acceptance review.

FAA received a comment submitted jointly by EAA, AOPA, NATA, and NBAA, plus 3 additional comments from individuals, on the topic of a training course test. The joint EAA, AOPA, NATA, and NBAA comment and two individuals stated they do not support codifying the acceptance of tests or prescribing a passing grade in the regulation as described in the NPRM, but did not provide supporting rationale for their perspective. These same commenters stated any exams related to the training course should continue to be the domain of the individual course curricula and associated policies. While these commenters stated they do not support the codifying of "acceptance" of tests, FAA notes the regulation as proposed would not require FAA acceptance of the course provider's tests. The regulation, as proposed and subsequently adopted, requires the training course to be accepted by FAA, and then further requires that the training course provider administer a written test that covers the contents of the FAA-accepted course. FAA requests a copy of the written test when submitting the training course for FAA-acceptance solely to confirm the course provider has a written test for the course. FAA is not reviewing the written test for FAA-acceptance separate from FAA-acceptance for the training course.

One commenter stated to be issued a certificate, a light-sport repairman applicant should complete oral and practical exams[253] to ensure sufficiency of training, without further supporting explanation. FAA disagrees with this commenter's assertion that the light-sport repairman certification process should require an oral and practical test in addition to, or in lieu of, the written test already administered. The training and testing

requirements to be eligible for a light-sport repairman certificate (i.e., certification rigor) are consistent with FAA's safety continuum related to light-sport category aircraft, and certificate privileges afforded to a light-sport repairman.[254] For example, to obtain a mechanic certificate with both an airframe and powerplant rating, a person must have either 30 months of practical experience or training by a part 147 certificated AMTS on all subject areas and elements in the Mechanic ACS.[255] FAA testing for a mechanic certificate includes a written test[256] and oral and practical tests[257] that cover the subject areas and elements of the Mechanic ACS. During testing, practical demonstrations may be required on any type of aircraft that operates in the NAS. In contrast, repairman training (light-sport) must only include those subject areas and elements of the Mechanic ACS that are applicable to the rating, aircraft category, and class requested; testing is done by course providers, not FAA, and only a written test is required. The certification framework differs between mechanics and light-sport repairman because the privileges afforded each certificate are very different. It would be burdensome to require oral and practical testing of light-sport repairman applicants without any data or supporting evidence that an added layer of proficiency validation is necessary.

7. Basis for Training Course Acceptance

a. FAA Training Course Acceptance

In the NPRM, FAA noted the agency will continue its current practice of accepting training courses, which involves providing an acceptance letter and assigning a course acceptance number to the course provider. In practice, FAA has issued course acceptance with a 24-month expiration consistent with FAA Order 8000.84B. In addition, FAA would notify a training course provider 60 days before the end of the acceptance period, at which time the training provider was asked to reapply for continuing

acceptance to provide the training. The NPRM discussed that, because FAA seeks to align training course content with the ACS, FAA no longer sees a need to assign a date for the expiration of course acceptance. Therefore, a training course that is found acceptable to FAA will no longer include a 24-month expiration date; a training course will continue to be acceptable unless a safety concern or regulatory non-compliance is identified. AC 65-32 discusses FAA regulatory and investigative authority; training course providers must ensure training course compliance with applicable provisions of part 65 (e.g., §§ 65.17, 65.107(c), 65.107(d), and 65.107(e)).

In addition, in the NPRM, FAA discussed a change in terminology that training courses be "acceptable to" FAA to "accepted by" FAA based on a Notice N8900.444 "Meaning of the Terms 'Acceptable to' and 'Accepted by' for Use by Aviation Safety Inspectors.[258] FAA noted § 65.107 used the term "acceptable to;" however, in practice, the courses are "accepted by" FAA. Therefore, FAA proposed to align the regulatory terminology with its practice and use the term "accepted by." This final rule adopts "accepted by" terminology in § 65.107.

EAA, AOPA, NATA, and NBAA and one individual stated they disagreed with any notion of FAA acceptance of the light-sport repairman certificate maintenance rating course. The commenters stated it would be a change in policy from today's highly effective and efficient system for certificating these repairmen. The commenters favored adherence to industry and FAA standards by "self-declaration" or "affirmation" of the course provider, and that any such self-declaration would be subject to FAA oversight.

This final rule will not be a burdensome change in policy from today's system of training course review and acceptance. The policy and practice in place prior to this final rule did not provide for any "self-declaration" or other such "affirmation" by a training

course provider. As discussed in the NPRM and explained herein, FAA has already required in § 65.107(a) light-sport repairman training courses to be determined acceptable to FAA, including courses for both an inspection rating and a maintenance rating. In addition, FAA includes the assigned acceptance number on the training course completion certificate for reference as evidence of eligibility for a light-sport repairman certificate. Further, this final rule revises certain policy to make the acceptance process less burdensome by no longer assigning an expiration date on a training course, thereby not requiring re-submission of training course acceptance materials every 24 months. Therefore, § 65.107 of this final rule will continue to require FAA acceptance of light-sport repairman training courses for both ratings.

In response to the NPRM discussion on course acceptance, one commenter asked who accepts training courses and how training courses are accepted. Section 65.107(c) and (d) will set forth the acceptance requirements for a repairman training course with an inspection rating or maintenance rating. As discussed further in this preamble, training course providers must also meet the requirements in § 65.107(e) (appropriate facilities, equipment, and materials to the training course content, appropriately qualified instructors, and provide a certificate of completion). Advisory Circular 65-32, Certification of Repairmen (Light Sport) describes the process for how a training course provider would request FAA acceptance. In addition, appendices A and B of AC 65-32 provide recommended course content for an inspection rating training course and a maintenance rating training course.

b. Training Course Provider Facilities, Equipment, Materials, and Instructors

In the NPRM, FAA explained it is crucial to set minimum standards for training course providers and proposed those standards in new § 65.107(e). FAA explained it

proposed to simply codify provisions consistent with AC 65-32A, which provides guidance on the acceptability of a training course, and current practice. Specifically, FAA proposed in § 65.107(e) that training course providers deliver the course using facilities, equipment, and materials appropriate[259] to the training course content being taught and by instructors who are appropriately qualified[260] to teach the course content. FAA did not receive comments on these provisions. In this final rule, FAA adopts the requirements but separates the requirements for readability. Section 65.107(e)(1) will address facilities, equipment, and materials while § 65.107(e)(2) will address instructors.

c. Training Course Completion Certificate

In the NPRM, FAA discussed that the current regulatory text lacks the explicit steps between completing the training and receiving the certificate. In turn, this creates a discrepancy between the eligibility element for a repairman certificate applicant to complete a training course and how that person provides proof of completing such a course upon certificate application. Therefore, FAA proposed to require in § 65.107(e) that training course providers issue each student a certificate of completion after the student has completed the training and passed a written test, intended to ensure an applicant has the means to demonstrate to FAA that the applicant has met the requirements for the certificate or rating. As proposed, the training provider would be required to issue a certificate of completion that includes the name of the training provider, FAA course acceptance number, the inspection or maintenance rating applicable to the training course, the aircraft category, and class as applicable, the training was based on, and the date of completion of the training.

FAA did not receive any comments regarding § 65.107(e). While FAA proposed this requirement in § 65.107(e), this provision is also separated for readability and is adopted as § 65.107(e)(3).

d. Training Course Design for a Class Within a Category

As further discussed in section IV.I.8, which details the revisions from the NPRM to this final rule, FAA finds a commenter's arguments that training courses should be category and class specific to be persuasive. In consideration of the commenter's concerns, FAA finds requiring training course content to be specific to a category, and class as applicable, appropriate because class-specific training course content will facilitate tailored training and, and subsequent category privilege limitations by class, for the light-sport repairman applicant. Issuance of category privileges and class-specific limitations on light-sport repairman certificates aligns with the § 1.1 definitions of category and class with respect to airman certification, and, as discussed in section I.V.I.10.a of this preamble, and is based on the training completed by the applicant.

However, FAA finds it is not necessary to require or permit separate training courses for certain classes defined in § 1.1, for example, the single vs. multi-engine and land vs. sea classes in the airplane, weight-shift-control aircraft, and powered parachute aircraft categories. From a maintenance perspective, FAA finds it is not necessary to prescribe certificate limitations based on the number of engines or the type of landing gear (floats vs other) an aircraft has because training courses should already be teaching applicable content from the Powerplant section and the Landing Gear subject area of the Mechanic ACS and covering aircraft with single vs. multi-engines and design difference (primarily landing gear) of land vs. sea classes. If FAA were to require separate training courses for these classes, courses would be almost identical in content with very minor

differences. Such minor differences could be covered in a category-based training course, rather than require development and acceptance of a class-based training course.

In contrast, the rotorcraft classes of gyroplane and helicopter and the lighter-than-air classes of airship and balloon have design differences between classes that would result in substantial training course content differences. For example, gyroplanes and helicopters, while both rotary-wing aircraft, differ primarily in how the rotors generate lift, which results in differences in the transmission and drive systems of each. Helicopters use a main rotor for lift and a tail rotor or other yaw generating system for directional control, while gyroplanes use a propeller for forward thrust, the rotor for lift, and typically incorporate a rudder for directional control in flight. Thus, differences in flight-control systems result in significant training differences. In general, gyroplanes are considered more simplistic in design compared to a helicopter.

Similarly, airships and balloons have design differences necessitating significant training differences across the classes in the lighter-than-air category. An airship, while relatively simple compared to an airplane, is considerably more complex in design compared to a balloon. While a balloon design consists of a fabric envelope, basket, burner, and limited instrumentation (if any), an airship adds training complexity related to a passenger carrying fuselage, engines, propellors, and a completely different flight control system, including related instruments.

In summary, FAA will require class-specific training for both inspection and maintenance rating training courses for the gyroplane, helicopter, airship and balloon classes, but will not require class-specific training for the single and multi-engine, and land and sea classes for airplanes, weight-shift-control aircraft, and powered parachutes. This is reflected in the regulatory text through use as “class as applicable.”

Providing for class-specific training for gyroplane, helicopter, airship, and balloon classes will provide more flexibility for light-sport repairman applicants to select the training course specific to the category and class they want to hold privileges for, rather than requiring training on all classes within a category and thus having to complete training on class(es) for which they do not wish to hold privileges. In addition, training course providers will not be required to design class-specific courses when class differentiation is based on aircraft design that does not result in substantial differences in course content, thus reducing the burden on training course providers to design additional training courses that would provide mostly duplicative training except for minor differences.

In sum, as adopted in § 65.107(c) and (d), training courses and content could be tailored to a category (for example, airplane) or to a single class, as applicable, of aircraft within the category (i.e., helicopter or gyroplane class within the rotorcraft category), for purposes of obtaining repairman certificate privileges. As discussed in section IV.I.1, FAA is adding "and class as applicable," to § 65.107(c) and 65.107(d) to require training course content be specific to category and a class within that category, when there is a class within a category for which a light-sport repairman could obtain privileges (e.g., lighter-than-air category, balloon class and airship class).

8. Rotorcraft Category Privileges

In the NPRM,[261] FAA explained the proposal to expand aircraft certificated under § 21.190 to rotorcraft and powered-lift would facilitate the ability of an airman to obtain a light-sport repairman certificate with privileges in the rotorcraft category and powered-lift category. Because § 21.190 is adopted to include these two categories of aircraft, this final rule makes a corresponding expansion to light-sport repairman certificate privileges

to ensure safe maintenance and inspection of these aircraft. As discussed in section IV.I.1, this final rule aligns the terms category and class as used in §§ 65.107 and 65.109 with their use in § 1.1, as applicable to airman certification. Therefore, light-sport repairman certificates will be issued with privileges for the rotorcraft category, not the gyroplane or helicopter class; however, as subsequently discussed, due to design differences between the gyroplane and helicopter classes, FAA will permit training to be class-specific, and will therefore issue limitations on a light-sport repairman certificate, limited to either gyroplanes or helicopters within the rotorcraft category, depending on the training completed. Before light-sport repairman certificates can be issued with privileges for these categories of aircraft, training course providers will have to develop supporting training courses, submit them to FAA for acceptance, and make that training available to students.

In accordance with § 65.107(c)(2) (as written prior to the applicable effective date of this final rule), FAA issues a repairman certificate (light-sport aircraft) with an inspection rating with class privileges for gyroplanes. Between establishing the repairman certificate (light-sport aircraft) in 2004 and the publication of this rulemaking, FAA has issued approximately 45 repairman (light-sport aircraft) certificates with an inspection rating and gyroplane class privileges. These repairmen completed an FAA-accepted gyroplane training course at some point in time, though there are no gyroplane training courses currently FAA-accepted. A maintenance rating with gyroplane class privileges was not permitted historically because FAA did not certificate gyroplanes as light-sport category aircraft under § 21.190.[262]

In the NPRM,[263] FAA discussed that a rotorcraft category training course is sufficient for either helicopter or gyroplane privileges, rather than requiring separate

courses because there is not a substantial difference in systems on gyroplanes and helicopters from a maintenance perspective. FAA received one comment regarding the proposal to permit a single rotorcraft training course that covers both gyroplanes and helicopters. The commenter posited there are significant differences between maintenance on helicopter versus gyroplane and, therefore, requiring students to learn both could limit the availability of training for those who only want to work on one aircraft in that category, such as gyroplanes. The commenter further stated these proposed changes are more restrictive than requirements prior to this final rule.

As proposed, FAA would have required training covering all aircraft classes within a category and issue repairman certificates (light-sport) with privileges extending to all aircraft classes in the category. FAA does not find the proposed changes, in general, to be more restrictive, since FAA regulations have not accounted for an inspection rating with helicopter class privileges or for a maintenance rating with privileges for either helicopters or gyroplanes. FAA acknowledges there are substantive differences between gyroplane and helicopter design, and to the commenter's point, those differences, combined with the complexity of helicopter and gyroplane designs, will result in substantial varied course content between those classes of aircraft. As previously discussed in section IV.I.7.d, the substantive differences between helicopters and gyroplanes, despite both being in the rotorcraft category, necessitate separate training courses for these classes of rotorcraft.

Therefore, FAA finds training courses providing instruction on both classes would insufficiently train applicants on the design and operational differences between these aircraft. Separate training for the rotorcraft category helicopter class and gyroplane class is necessary to ensure light-sport repairmen are sufficiently trained to perform the

duties of their certificate, ratings, and privileges. Similar to the rotorcraft category, the lighter-than-air category training courses must be separated into class-specific training for airship and balloon classes due to the substantial design differences in these classes. Accordingly, FAA has determined training on a single class of aircraft within the rotorcraft and lighter-than-air categories are necessary safety measures to ensure light-sport repairmen are sufficiently trained to perform the privileges on their certificate. Further, allowing certificate limitations based on training would allow repairmen applicants to tailor their training to the ratings and privileges they wish to obtain. FAA expects that helicopters and gyroplanes will have different consensus standards, due to differences in design and operational characteristics, therefore, allowing training by class would support training course development on one class, regardless of whether a consensus standard was created for the other classes within the category.[264] In addition, should future classes of aircraft be added to any category (e.g., powered-lift[265]), FAA could address certificate privileges through these privilege limitations based on training completed by the airman.

To date, FAA has issued 40 repairman certificates (light-sport), with an inspection rating and gyroplane class privileges. On [INSERT DATE 90 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER], these light-sport repairmen will hold a certificate that states the repairman has gyroplane class privileges, but for which the regulation provides rotorcraft category privileges limited to gyroplane class. These repairmen had to complete a 16-hour training course that was found acceptable to FAA on inspecting the gyroplane class of experimental light-sport aircraft.

After [INSERT DATE 90 DAYS AFTER PUBLICATION OF FINAL RULE], a person holding a light-sport repairman certificate (light-sport aircraft) with an inspection

rating and gyroplane class privileges may request a replacement repairman certificate from FAA showing rotorcraft category privileges with a gyroplane class limitation, consistent with § 65.107(f)(3) as adopted in this final rule. Regardless of whether the airman requests a replacement certificate, as outlined in final rule § 65.107(f)(3), on [INSERT DATE 90 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER], a repairman certificate (light-sport aircraft), with an inspection rating and gyroplane class privileges, is equivalent to a repairman certificate (light-sport), with an inspection rating and rotorcraft category privileges limited to the gyroplane class.

9. Duration of Repairman Certificates

In the NPRM,[266] FAA proposed to revise § 65.15(a) and (b), which set forth the duration and effectivity of certificates issued under part 65, to reflect the distinction of the effective period of repairman certificates issued under § 65.101 from that of other repairman certificates issued under §§ 65.104 and 65.107. Specifically, employment is a requirement unique to repairman certificates issued under § 65.101, whereas different durations apply to repairman certificates used under §§ 65.104 and 65.107, which include an exception from the employment requirement (and the other general eligibility requirements set forth in § 65.101). As proposed, this revision will retain the existing duration of repairman certificates issued in accordance with § 65.101 to be effective until the repairman is relieved from the duties for which the repairman was employed and certificated (unless the certificate is sooner surrendered, suspended, or revoked). Concurrently, the proposed revision clarifies previous language, which implied the duration of repairman certificates issued under §§ 65.104 and 65.107 were tied to employment and job duties without enumerated employment requirements. The NPRM also proposed to remove the date reference in § 65.15(d), which specifies that (except for

temporary certificates issued under § 65.13) the holder of a paper certificate issued under part 65 may not exercise the privileges of that certificate after March 31, 2013. That date referred to a compliance date that has since passed and, as such, is no longer necessary.

FAA received one joint comment from AEA/ARSA on the proposed changes to § 65.15. The commenters did not agree with the proposed rule as written based on the Aviation Rulemaking Advisory Committee (ARAC) Repairman Certificate Portability Working Group's (RCPWG) preliminary recommendation report, dated September 22, 2023.[267] In the report, the RCPWG recommended that § 65.15(b) be deleted in its entirety, § 65.101(a)(2) be amended to remove the language relating to employment, and § 65.101(a)(3) be deleted in its entirety. The report recommended these changes to align part 65 subpart E with the revised language of § 145.159, which "revised the certification of repairmen to promote and encourage workforce development" in 2004 amendment no. 145-27.[268]

Revising §§ 65.15 and 65.101 as recommended in the preliminary report from the ARAC Repairman Certificate Portability WG is inconsistent with the purpose of this final rule. As explained in the NPRM, this rulemaking is specific to special airworthiness certification, including increased privileges for repairman, and in the context of § 65.15 the ability of a light-sport repairman to perform maintenance on specified aircraft. The ARAC RCPWG's recommendations referenced by AEA/ARSA pertain to the portability of repairman certificates issued in accordance with § 65.101 specific to employment and an alleged disconnect between part 65 and part 145. The NPRM did not propose revising repairman certificates issued under § 65.101 or any revisions to part 145. The proposed amendments to § 65.15 were intended to correct inaccurate regulatory text related to the duration of repairman certificates issued in accordance with § 65.107 (i.e., light-sport

repairman certificate). To note, the RCPWG report was published after the MOSAIC NPRM published, and FAA continues to analyze the report. These recommendations on parts 65 and 145, which would encompass sections unrelated to this rulemaking, would be more appropriately addressed in an independent action with notice to the regulated community and an opportunity for comment if FAA determined regulatory changes were appropriate.

Therefore, in this final rule, FAA is adopting the amendments to § 65.15, as proposed.

Relatedly, § 65.103 provides the privileges and limitations for a repairman certificate issued under § 65.101. In the NPRM, FAA proposed to amend § 65.103(c) to state that § 65.103 does not apply to the holder of a repairman certificate issued in accordance with either § 65.104 (experimental aircraft builder) or § 65.107 (light-sport). As explained, § 65.103 indicates that paragraphs (a) and (b) are only applicable to repairman certificates issued in accordance with § 65.101, which is the only repairman certificate type that has requirements relating to employment; however, § 65.103 also does not apply to a repairman certificate issued in accordance with § 65.104 (experimental aircraft builder repairman). No comments were received on this proposal. Accordingly, in this final rule, FAA adopts the amendment to § 65.103(c), as proposed.

10. Repairman Certificate (Light-Sport) Privileges and Limitations

a. General

As previously discussed, light-sport repairmen are issued a repairman certificate with either an inspection or a maintenance rating, based on the rating requested and the aircraft category privileges sought. The certificate and rating are issued only after the applicant has completed training and then passed a test administered by the training

course provider, which are specific to both the rating sought and the aircraft category, and class as applicable, for which privileges are requested. As discussed in section IV.I.1, the privileges of a light-sport repairman certificate are limited, depending on the rating(s), to aircraft holding certain airworthiness certificates and operating purposes. One commenter stated the final rule should state explicitly that persons who have completed training for a light-sport repairman certificate be allowed to maintain aircraft approved under the requirements prior to this final rule taking effect. FAA notes training is a requirement for certification, training does not in and of itself provide certificate privileges. In the NPRM, FAA stated existing repairman certificate (light-sport aircraft) holders may inspect or maintain aircraft as permitted by privileges and limitations afforded that repairman under this final rule. Consistent with the discussion in section IV.I.7.d, explaining that training courses are to contain training course content in a category, and class as applicable, FAA will issue light-sport repairman certificates with applicable rating and category privileges, and will issue a limitation for the specific class within the rotorcraft and lighter-than-air categories, specific to the class of aircraft for which the applicant completed the training course. For example, if a light-sport repairman applicant completes a 16-hour inspection rating training course for a rotorcraft category, helicopter class, the light-sport repairman would be issued a repairman (light-sport) certificate with an inspection rating in the rotorcraft category limited to helicopter class. As another example, if a light-sport repairman applicant completes a maintenance rating (based on the Mechanic ACS) in the lighter-than-air category, specific to the balloon class, the applicant would be issued a repairman (light-sport) certificate with a maintenance rating in the lighter-than-air category limited to the balloon class.

To provide for the issuance of limitations based on a class of aircraft within an aircraft category, this final rule includes a provision in § 65.107(f)(1) stating that an applicant may have a limitation placed on their airman certificate that limits the certificate privileges to a class within the category. The regulation also states the limitations added to a certificate reflect the FAA-accepted training the applicant has completed. A certificate with no class limitations would have privileges on all classes within the category.

In the NPRM,[269] FAA proposed to move the requirements from § 65.107(b)(2), which sets forth that a person may perform the annual condition inspection if the aircraft has been issued an experimental airworthiness certificate under § 21.191(i), with certain conditions, to new § 65.109 (setting forth a comprehensive section of privileges and limitations). To address a situation where an individual was issued a repairman certificate (light-sport aircraft) with an inspection rating specific for a former light-sport category aircraft (experimental purpose under proposed § 21.191(i)), and the aircraft was later re-certificated as a light-sport category aircraft (special airworthiness certificate under § 21.190), FAA proposed to remove certain language in § 65.107 (adopted as new § 65.109). Specifically, FAA proposed to remove the phrase "been issued" and, as discussed in section IV.I, this final rule makes a conforming terminology change from "experimental certificate" to "experimental airworthiness certificate" so the text reads "… has an experimental airworthiness certificate…" This removal will require that, to exercise the privileges of the light-sport repairman certificate inspection rating, the aircraft must have the appropriate experimental airworthiness certificate; the privileges do not extend to an aircraft that had ever "been issued," at some point in time, an experimental airworthiness certificate for one of the purposes specified in the regulation.

No comments were received on this proposed amendment; however, this same language was used in § 65.107(c)(1) and (2). For the same reasons discussed in the NPRM regarding § 65.107(b)(2), FAA is adopting this clarifying change for purposes of the recodification of § 65.107(c)(1) and (2) at § 65.109(b)(1) and (2) of this final rule.

The NPRM proposed a conforming amendment to § 65.109(a)(2) and (b)(2) based on proposed § 21.191, which removed paragraph (i)(3) from § 21.191. The NPRM explained this conforming amendment as necessary because § 65.109(a)(2) and (b)(2) state what aircraft a light-sport repairman is privileged to approve for return to service and refer to § 21.191 regulatory language that was proposed to be amended in the NPRM. However, as discussed in section IV.L, this final rule will retain § 21.191(i)(3) until [INSERT DATE 365 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]. In addition, FAA is adding new § 21.191(l) for issuance of airworthiness certificates for the purpose of operating a former light-sport category aircraft, and new § 21.191(k) for issuance of airworthiness certificates for the purpose of operating a light-sport category kit-built aircraft. FAA intended for light-sport repairmen to be privileged to work on the same aircraft, whether certificated before or after [INSERT DATE 90 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

Therefore, § 65.109(a)(2) and (b)(2) of this final rule retain the language providing for privileges on aircraft certificated under § 21.191(i) and have also been revised to include aircraft issued an experimental airworthiness certificate under § 21.191(l) and (k). In addition, FAA is expanding repairman privileges in § 65.109(a)(2) and (b)(2) to aircraft certificated under § 21.191(g). This expansion in privileges is discussed in detail in the subsequent section.

b. Expand Repairmen (Light-Sport) Privileges to Include EAB Aircraft Under § 21.191(g)

FAA received approximately 75 comments from commenters who recommended that FAA expand § 65.109 privileges to allow light-sport repairmen to perform a condition inspection on aircraft issued an experimental airworthiness certificate under § 21.191(g) for the purpose of operating EAB aircraft. Commenters stated a shortage of FAA-certificated mechanics makes it difficult to find a mechanic to do the condition inspections on EAB aircraft and allowing light-sport repairmen to do the condition inspection on these aircraft would alleviate the demand on mechanics and would create a business case for light-sport repairmen. Commenters also stated increasing the number of certificated persons who are authorized to inspect EAB aircraft would enhance safety.

Some commenters implied that condition inspections may not be performed as required by the regulations due to their inability to find a certificated mechanic or repair station. Many commenters who are owners of these aircraft stated, because owners are permitted to do the maintenance on their EAB aircraft, owners are much more knowledgeable on the aircraft than the mechanic who must perform the condition inspection and supported the expansion of privileges to EAB aircraft so they could perform the condition inspections themselves. Commenters also stated the costs associated with having a mechanic or repair station perform the annual condition inspection are overly burdensome due to the lack of available resources to perform this work. Commenters contended that expanding light-sport repairman certificate privileges to EAB aircraft would enhance safety, control costs, keep maintenance/inspections accessible, allow for more and better training of operators and maintainers, and ease the burden on FAA-certificated mechanics. Some commenters also suggested that mechanics

worry about unnecessarily increasing their liability in finding these aircraft safe for flight when owners are already liable for these aircraft.

Several commenters cited the similarities between light-sport category aircraft and EAB aircraft. In some cases, owners claim to have built EAB aircraft to the same plans and specifications as a factory-built light-sport category aircraft and the only difference is paperwork. FAA notes there may be similarities between EAB and light-sport category aircraft, but design and production standards are an important difference. While many EAB or kit-built aircraft may have an identical design (on paper) to a factory-built aircraft, aircraft certification in the light-sport category includes meeting consensus standards and part 22, which have additional requirements such as training, quality control, etc., that are not applicable to other builders.

Currently, operating limitations issued to EAB aircraft provide that an appropriately rated mechanic, a repair station, or the holder of a repairman certificate (experimental aircraft builder) issued in accordance with § 65.104 may perform a condition inspection on an EAB aircraft. Only the primary builder of the EAB aircraft is eligible for a certificate issued under § 65.104, and the certificate is limited to performing the annual condition inspection on that specific aircraft (by aircraft make, model, and serial number). When an EAB aircraft is sold by the original builder, the builder's repairman certificate (experimental aircraft builder) privileges are still valid for the aircraft (by make, model, and serial number); however, the new owner does not have the option to get a repairman certificate (experimental aircraft builder) because the new owner is not the builder of the aircraft. This results in the new owner lacking eligibility for a repairman certificate (experimental aircraft builder) and having to obtain the

services of a certificated mechanic or repair station to perform the required condition inspection on their EAB aircraft.

FAA agrees with commenters' suggestions and finds there is a safety benefit in permitting additional properly trained and certificated repairmen to perform condition inspections on EAB aircraft because it will be easier for owners to find qualified personnel to conduct required inspections. Therefore, this final rule expands the privileges of a light-sport repairman certificate under § 65.109 to allow a certificate holder, with either rating (inspection or maintenance), to perform the annual condition inspection on an EAB aircraft issued an experimental airworthiness certificate under § 21.191(g).[270]

The changes adopted in § 65.109(a) and (b) of this final rule do not impose additional restrictions but rather expand the privileges of a light-sport repairman. Specifically, § 65.107(c) will allow a light-sport repairman with an inspection rating to perform the annual condition inspection on an EAB aircraft that is owned by the repairman and that is in the same category of aircraft for which the certificate holder was trained.[271] In addition, § 65.109(b) will permit a light-sport repairman with a maintenance rating to perform the annual condition inspection on an EAB aircraft that is in the same category of aircraft for which the certificate holder was trained.[272]

To emphasize, this final rule expands light-sport repairman privileges only to aircraft issued an experimental airworthiness certificate under § 21.191(g) (operating EAB aircraft) and the condition inspection required on those aircraft; the expanded privileges do not extend to other aircraft issued an experimental airworthiness certificate under § 21.191. Similar to light-sport aircraft, EAB aircraft are typically of simple design. If the complexity of an EAB aircraft exceeds the light-sport repairman's training

(for example, large, turbine, or jet-powered aircraft), repairman privileges would not include that aircraft because the operating limitations issued to these aircraft require inspections beyond that of a condition inspection. Depending on the complexity of the aircraft, FAA may prescribe operating limitations under § 91.319(i) that require such aircraft be maintained in accordance with an inspection program meeting the scope and content of § 91.409(f). The inspections referred to in § 91.409(f) are not condition inspections and therefore do not fall under the privileges of a light-sport repairman. Inspections required under § 91.409(f) must be performed by a certificated mechanic or repair station.

FAA reviewed the historical rulemaking specific to EAB aircraft,[273] and the comments raised during that rulemaking process, because the privileges afforded to a repairman (experimental aircraft builder) under that rulemaking were similar to the privileges recommended by commenters during this rulemaking. The expanded privileges apply to EAB aircraft, which are lower on the safety continuum than light-sport aircraft, and FAA has considered past public comment concerning the performance of condition inspections on EAB aircraft and has considered the history in adopting this change in the final rule. FAA notes this change places no additional requirements onto certificate holders or applicants since these certificate holders are already required to be trained on performing a condition inspection applicable to that aircraft.

Regarding FAA's safety continuum concept, EAB aircraft rank lower on the safety continuum than light-sport category aircraft. EAB aircraft are not required to be built to any design or production standard and are not required to be maintained under part 43. This differs from light-sport category aircraft, which have design and production standards and are required to be maintained under part 43. However, under the authority

of § 91.319(i),[274] FAA issues operating limitations for EAB aircraft, which are considered a part of the aircraft's airworthiness certificate. One such operating limitation issued to the majority of EAB aircraft[275] prohibits operation of the aircraft unless, within the preceding 12 calendar months (before the intended operation), the aircraft has had a condition inspection performed per the scope and detail of part 43, appendix D.[276]

Allowing light-sport repairmen to perform the annual condition inspection on EAB aircraft is consistent with the overall safety continuum concept and, as noted by numerous commenters, would expand the opportunity for the required condition to be completed by a certificate holder who is trained in conducting such an inspection. Moreover, FAA notes that light-sport repairman privileges already extend to certain other aircraft issued experimental airworthiness certificates,[277] including aircraft that are not built to a consensus standard, such as aircraft issued an airworthiness certificate in accordance with § 21.191(i)(1).[278]

The issuance of a repairman certificate (experimental aircraft builder) is based on the individual having demonstrated knowledge and skill to FAA.[279] Therefore, FAA finds that completion of a light-sport repairman training course, and passing of a course test, would be another way that an individual could demonstrate the necessary knowledge and skill to perform the condition inspection on an EAB aircraft. Such training is already designed to provide the knowledge and skills necessary to determine if an aircraft is in a condition for safe operation. Under § 65.107(c) of this final rule, training for an inspection rating must include a minimum of 16 hours of training on inspecting the category, and class as applicable, of aircraft for which privileges are sought on the certificate. Under § 65.107(d) of this final rule, training for a maintenance rating must include training on the knowledge, risk management, and skill elements for each subject

in the Mechanic ACS that are appropriate to the category, and class as applicable, of aircraft privileges sought on the certificate. This training must include training on the performance of a condition inspection.[280] Training courses differ based on the aircraft category privileges sought. The training must cover a specific aircraft category, and class as applicable (refer to section IV.I.7.d for additional discussion). Therefore, it follows that an individual who is appropriately trained on particular category and applicable class of aircraft and their systems, or trained on performing a condition inspection on a specific category and applicable class of aircraft, and who takes and passes a test on that knowledge, would also have demonstrated to FAA the person has acceptable knowledge to perform a condition inspection on an EAB aircraft that falls in the same aircraft category for which the individual was trained.

The rulemaking[281] that created the repairman certificate (experimental aircraft builder) under § 65.104, allows the person who built the major portion of an EAB aircraft to obtain this repairman certificate to perform the required condition inspection on that specific EAB aircraft.[282] During that rulemaking, several commenters suggested that the repairman certificate (experimental aircraft builder) be made available to all owners of EAB aircraft after the owner demonstrates the required level of knowledge and skill. FAA disagreed with the suggestion because, at the time, there was no method for such persons to demonstrate their knowledge and skill apart from being the person that built the aircraft; however, that is no longer the case. Light-sport repairmen are specifically trained in conducting a condition inspection on a particular category, and class as applicable, of aircraft, and that training can also be applied to conducting a condition inspection on an EAB aircraft in the same category, and class as applicable. Light-sport repairman training courses can provide those owners of EAB aircraft, who did not build

the major portion, with an alternate method of demonstrating the necessary knowledge and skill to perform the required condition inspection.

Another comment addressed in the 1979 final rule asserted that having built a part of the aircraft does not qualify a person to inspect all of that aircraft. FAA responded that inspection does not require extensive knowledge of systems. This principle and response remain valid, evidenced by the different training requirements associated with the inspection and maintenance ratings on a light-sport repairman certificate; discussed in sections IV.I.3 and IV.I.4, respectively. Therefore, under this final rule, while an EAB aircraft builder may only inspect the aircraft the builder has built, a light-sport repairman may inspect any aircraft in the category and applicable class of aircraft on which the repairman was trained.

In summary, FAA finds that expanding the privileges of a repairman certificate (light-sport) to allow the holder to conduct the condition inspection on an EAB aircraft aligns with the safety continuum for the aircraft's certification basis, reduces the burden on aircraft owners on finding qualified personnel to inspect their aircraft, and results in a safety benefit. Therefore, this final rule expands the privileges of the light-sport repairman inspection rating in § 65.109(a)(2) to allow a holder of that certificate and rating to conduct an annual condition inspection on an aircraft owned by that repairman, which has an experimental airworthiness certificate for the purpose of operating EAB aircraft, and on which the repairman has completed the prescribed training on the corresponding category and applicable class of aircraft. Furthermore, FAA adopts the same expansion in § 65.109(b)(2) for those holders of a light-sport repairman certificate with a maintenance rating.

c. Expand Repairmen Certificate (Light-Sport) Privileges to Aircraft Holding Standard Airworthiness Certificates

FAA proposed to move repairman privileges from § 65.107(b) and (c) to new § 65.109(a) and (b), respectively. This final rule adopts this redesignation, which continues to prohibit a light-sport repairman with either rating from performing inspections or maintenance on an aircraft issued a standard airworthiness certificate in accordance with § 21.183. In response to the NPRM, FAA received approximately 27 comments suggesting that FAA expand the privileges of a light-sport repairman certificate to allow the holder of such a certificate to perform maintenance and inspections (to include the annual inspection) on aircraft holding standard airworthiness certificates and that meet the performance limits and design requirements in § 61.316 that a sport pilot is authorized to operate.

Commenters cited difficulty and costs in finding a mechanic to perform maintenance and an inspection authorization (IA) holder to perform the annual inspection on these aircraft. Other commenters stated there are no differences between aircraft that hold standard category airworthiness certificates and certain light-sport category aircraft.

FAA disagrees with commenters that light-sport repairman certificate privileges should extend to performing work on aircraft that hold standard airworthiness certificates. Though, as commenters mention, there are examples of light-sport category aircraft that look identical to aircraft holding standard airworthiness certificates, such aircraft are designed and manufactured to different standards. Aircraft holding standard airworthiness certificates are higher on the safety continuum than light-sport category aircraft and meet more rigorous requirements for design, production, and airworthiness certification. The higher placement of aircraft holding standard airworthiness certificates on the safety

continuum also merits corresponding greater rigor for certification of persons who may inspect and maintain these aircraft in conformity with the applicable type certificate than those of a light-sport repairman. The NPRM did not propose to change regulations relating to the aircraft holding standard airworthiness certificates and to allow repairman light-sport certificate holders to do so would likely require increased training requirements to be issued a repairman certificate.

It is important to note that aircraft with a standard airworthiness certificate are not light-sport category aircraft, even though some of those aircraft may be operated by a sport pilot.[283] FAA does not agree that just because a pilot can operate certain aircraft that hold standard category airworthiness certificates that those aircraft can be maintained and inspected by someone other than a mechanic or repair station. FAA regulations specify the appropriate airman certificate necessary for performing maintenance and inspections based on the airworthiness certificate issued to the aircraft, which is reflective of the aircraft's placement on the safety continuum. Aircraft that hold standard airworthiness certificates may be used for carriage of people and property for compensation or hire. Though a sport pilot may be authorized to operate this aircraft (based on whether the aircraft meets the parameters set forth in new § 61.316), another appropriately certificated and rated pilot may use that same aircraft for carriage of people or property for compensation or hire. Therefore, at all times, these aircraft must be inspected and maintained by appropriately certificated persons who have met a higher standard of knowledge and skill to preserve conformity with their respective type certificates, reflecting the greater privileges and exposure of the public to risk for operations of type-certificated aircraft.

FAA recognizes that costs associated with the maintenance and inspection requirements of aircraft that hold standard airworthiness certificates are typically higher than that of light-sport category or experimental aircraft. However, those costs are well known to owners, prospective owners, and operators of these aircraft; other options for aircraft ownership and operation are available. FAA prioritizes the safety of higher risk operations above cost. In summary, FAA declines to expand repairman certificate (light-sport) privileges to aircraft holding standard airworthiness certificates.

d. Changes to FAA Policy for Issuance of a Repairman Certificate (Light-Sport) Inspection Rating

FAA will no longer require an applicant for a light-sport repairman certificate to show evidence of aircraft ownership and will not deny a certificate or rating based on whether an applicant owns an aircraft certificated in accordance with § 21.191(g), (i), (k), or (l). Though not discussed in the NPRM, this is a change to internal policy and does not impose new burdens or obligations to the regulated community, nor does this change affect existing or future certificate privileges. Ownership is not a certificate or rating eligibility requirement specified in § 65.107(b); rather, ownership is a requirement to exercise the privileges of an inspection rating, as specified in adopted § 65.109(a). Furthermore, applicants will not be asked to provide, and repairman certificates (light-sport) will not be issued with, aircraft registration number (N-number) and serial number (S/N) information of aircraft owned by the applicant.

In the NPRM, FAA discussed inspection rating privileges and limitations in paragraph F.7.[284] FAA explained that, should the proposal be adopted as a final rule, the language in § 65.107(b)(2) could result in a situation where an individual was issued a repairman certificate with an inspection rating specific for a former light-sport category

aircraft (experimental purpose under proposed § 21.191(i)), and the aircraft could later be re-certificated as a light-sport category aircraft (special airworthiness certificate under § 21.190). In this scenario, if the aircraft was then again re-certificated in accordance with § 21.190, that repairman's certificate, which states the aircraft N-number and S/N could lead the repairman to believe they could continue to conduct the annual condition inspection on that aircraft. FAA did not intend to allow for repairmen with an inspection rating to conduct an annual condition inspection on aircraft certificated under § 21.190; rather, § 65.109(a)(2) sets forth the aircraft a light-sport repairman with an inspection rating may perform the annual condition inspection upon. FAA finds that by not specifying the aircraft N-number and S/N information on the repairman certificate, the scenario described would be unlikely to occur.

11. Other Comments on Repairman Certificates

Two commenters indicated they understood the proposed regulations to require a light-sport repairman with a maintenance rating to have supervision by a mechanic. FAA disagrees; maintenance rated light-sport repairmen are authorized to maintain and approve for return to service without the supervision of a mechanic, as permitted by § 65.109(b) and (c). This final rule did not narrow the practical application of the privileges of a repairman certificate to require supervision.[285]

One commenter pointed out that the regulations for light-sport repairmen do not authorize a light-sport repairman to supervise non-certificated individuals. The commenter stated the lack of a specific regulation prohibiting the supervision of a non-certificated person by a light-sport repairman has resulted in light-sport aircraft repair companies using non-certificated individuals. The commenter recommended that FAA

specifically state whether a light-sport repairman can or cannot supervise non-certificated persons doing work on aircraft.

FAA disagrees that adding a specific regulation prohibiting light-sport repairmen from supervising non-certificated individuals is necessary. Under § 65.109, light-sport repairmen are not provided broad supervisory privileges over maintenance, preventive maintenance or alteration, such as that provided a mechanic under § 65.81 or a § 65.101 repairman under § 65.103. Supervisory privileges for light-sport repairmen are included in § 65.109(c),[286] but only to the extent of supervising a person already holding a repairman certificate (light-sport).

Though § 43.3(d) specifies that a person (i.e., a non-certificated person) working under the supervision of the holder of a repairman certificate may perform work on aircraft to which part 43 applies, that authority only applies to work the repairman certificate holder is authorized to perform, in accordance with the privileges granted in part 65. Therefore, while light-sport repairmen may supervise other repairmen or mechanic certificate holders in the context of § 65.109(c), light-sport repairmen may not supervise non-certificated persons performing work under § 43.3(d), as permitted for other certificate holders.

One commenter suggested that light-sport repairmen should have currency requirements similar to mechanics as set forth in § 65.83. FAA disagrees that recent experience requirements are necessary for repairmen given the placement of light-sport repairman certificate privileges being lower on the safety continuum and more narrow privileges commensurate to the training and proficiency profile.

One commenter expressed concern the requirement in § 65.109(c), to only approve for return to service work that the light-sport repairman has previously

performed satisfactorily is not likely to be detected given the oversight requirements of light-sport repairmen by FAA inspectors. Furthermore, the commenter asserted that current policies would likely hinder enforcement if FAA found a light-sport repairman who returned an aircraft to service without documented experience for that work. FAA expects certificated persons to comply with all applicable regulatory requirements, regardless of any perception of FAA's ability to enforce the regulation. There is no requirement for individuals to retain documented evidence of their experience showing § 65.109(c) has been met. The § 65.109(c) restriction has existed in § 65.107 since the inception of the light-sport repairman regulations in 2004, and a similar requirement has existed in § 65.81 for mechanics for a much longer time. Therefore, FAA will not make any amendments related to this comment.

In the NPRM, FAA proposed to recodify the language in § 65.107(d) prohibiting a light-sport repairman with a maintenance rating from approving for return to service any work unless the repairman has previously performed that work satisfactorily, to new § 65.109(c). AEA/ARSA commented that, while they agree with the provision, the regulation should be amended to require recordkeeping to show the person is qualified on a specific task (i.e., a technician logbook). The commenters stated such a change would be consistent with the regulations of § 145.163, as well as international maintenance technician standards. FAA declines to place an additional burden on certificate holders in the form of recordkeeping when existing regulations have not shown an adverse effect on safety.

LAMA recommended § 65.109(c) be revised to include language from § 43.13. Specifically, LAMA recommended FAA amend § 65.107 to include that "[t]he holder of a repairman certificate (light-sport aircraft) with a maintenance rating may not approve

for return to service any aircraft or part thereof unless that person has successfully completed appropriate training for the work performed and shall use the methods, techniques, and practices prescribed in the current manufacturer's maintenance manual or Instructions for Continued Airworthiness or specific training or instruction prepared by its manufacturer, or other methods, techniques, and practices acceptable to the Administrator."

The commenter stated § 43.13 Performance rules (general) have provided an acceptable level of safety for traditional airframe and powerplant mechanics and there is no data that suggests applying the same concept to light-sport repairmen would reduce safety. FAA finds it is not necessary to add § 43.13 language to § 65.109(c). Under § 91.327, light-sport category aircraft must be maintained in accordance with part 43, which includes § 43.13; therefore, it is unnecessary to duplicate the § 43.13 requirements in part 65.

GAMA requested clarification that training or other acceptable means would address the requirement in § 65.109(c) that only permits a light-sport repairman to approve for return to service when the work has been previously performed satisfactorily. While § 65.109(c) requires the person to have performed the work satisfactorily, the regulation does not prohibit a person from meeting this requirement by performing the work in a training environment.

One commenter is concerned the NPRM leaves significant portions of the proposal undefined, as indicated by the use of asterisks, and is concerned the public will not have opportunity to comment before changes become regulatory. FAA follows the National Archives and Records Administration Document Drafting Handbook (DDH) to

draft rulemaking documents for publication in the *Federal Register*. Pursuant to the DDH, asterisks are used to represent text in regulations that is not being changed.[287]

One commenter expressed concern that FAA did not pre-coordinate the proposed rule with manufacturers and the aviation community. Specifically, the commenter found it especially troubling that the repairman training course providers were not asked for input into defining the training requirements for maintenance and inspection considering that course providers have the greatest expertise in this area. The commenter asked that the light-sport repairmen training requirements be reconsidered with a heavy emphasis placed on input from light-sport repairman training course providers. Under 5 U.S.C. 553, the APA requires agencies to provide the public with notice of proposed rulemaking. To satisfy required notice under section 553, agencies afford interested persons a reasonable and meaningful opportunity to participate in the rulemaking process, generally referred to as "an opportunity to comment." As an agency engaging in the rulemaking process, FAA published the NPRM[288] for MOSAIC on July 24, 2023. As previously discussed, and stated in the NPRM, the intent of the MOSAIC proposed rule was to provide relief and greater flexibility to repairman training course providers. Therefore, FAA afforded the public reasonable and meaningful opportunity to participate in the rulemaking process through public comment submission in the rulemaking docket, initially through October 23, 2023, and then extended the public comment period by 90 days, to January 22, 2024. FAA received over 1,350 comments, including comments from training course providers. In developing this final rule, FAA considered all comments received on the NPRM, including those provided by training course providers.

12. Out of Scope Repairman Comments

a. Mechanic Certification

Several commenters expressed concerns about a shortage of certificated mechanics; some suggested the proposed rule will ease the burden caused by this shortage while others suggested the regulations would instead exacerbate the shortage. Some commenters suggested the light-sport repairman training courses could provide a path toward obtaining a mechanic certificate, particularly if the training would count toward the requirements of a mechanic certificate. Multiple commenters stated FAA should develop new regulations to transition from light-sport repairman to mechanic, while others commented that the light-sport regulations should be left alone for the same reason. One commenter recommended amending the mechanic certification regulations to include the use of endorsements. Van's Aircraft commented on the need for additional mechanics and other maintenance personnel and asked that FAA look at the opportunity to credit hours within high school programs toward mechanic certification. Another commenter proposed that FAA redesign the mechanic certification process to allow a person who wished to work on aircraft to be able to do so in steps. AEA/ARSA recommended this rulemaking update the title of a certificated mechanic to certificated aviation maintenance technician.

The proposed rules were not intended to address issues specific to FAA-certificated mechanics and FAA does not believe this rule will significantly impact the number of future mechanics. While light-sport repairman training courses cannot be credited toward meeting § 65.77 requirements for a mechanic certificate or rating applicant, such an applicant may apply practical experience[289] gained towards meeting the experience requirement in § 65.77(b)(1). Comments suggesting broad changes to mechanic certification rules are outside the scope of this rulemaking.

b. Mechanic Training

Approximately 55 different commenters asserted FAA-certificated mechanics are not trained or otherwise familiar with performing maintenance on light-sport category aircraft and suggested mechanics should be required to get additional training applicable to light-sport aircraft. As discussed in section IV.I.11, § 65.81 prohibits mechanics from approving work for return to service unless the mechanic has previously performed that work satisfactorily. FAA finds this requirement to sufficiently ensure the person is adequately familiar and proficient on the required work to be performed. Training would be one way a mechanic could meet § 65.81 (i.e., perform the work satisfactorily in a training environment).

One commenter stated all mechanic certificates should be a basic certificate with training and endorsements for more complex systems. As previously stated, mechanic certification and training are outside the scope of this rulemaking.

c. Part 147 AMTS Curriculum

One commenter recommended that part 147 school curriculums be modified to teach more new engine technologies and avionics. Another commenter stated AMTS curricula do not include training mechanics to work on light-sport aircraft and there is little interest in doing so because most mechanics will be working on highly complex aircraft, not light-sport aircraft. Part 147 AMTS curricula are outside of the scope of the MOSAIC rulemaking; however, FAA notes that AMTS curricula must include content on light-sport aircraft, since mechanic certificate privileges include those aircraft. In addition, AMTS can modify their curricula at any time to teach additional content. The requirement for AMTS to align their curriculum with the Mechanic ACS is a minimum standard.

13. Part 147

FAA notes the final rule includes an amendment to the incorporation by reference (IBR) provision in § 147.17 to update the contact information to Certification Testing Group, 202-267-1100, ACSPTinquiries@faa.gov. This final rule makes a conforming amendment to § 65.23 in the introductory paragraph to correct the group contact name to "Training and Certification Group" for consistency with § 147.17 IBR and accuracy of contact details.

J. Maintenance

Aircraft certificated in the light-sport category are subject to the operating limitations specified in § 91.327, which include requirements related to maintenance, repairs, and alterations. This final rule revises the maintenance requirements for light-sport category aircraft in § 91.327 regarding safety directives, major and minor repairs and alterations, and other limitations. In addition, FAA is adopting conforming changes to §§ 43.1, 65.85, 65.87, and 91.417.

1. Manufacturer's Safety Directives

In the NPRM, FAA proposed removing the requirement in § 91.327(b)(4) that an owner or operator of a light-sport category aircraft comply with safety directives issued by the aircraft manufacturer. FAA also proposed removing the corresponding requirement to record compliance with manufacturer safety directives in § 91.417(a)(2)(v).

FAA received four comments related to the proposed rule to remove the requirement to comply with safety directives issued by the aircraft manufacturer. Two commenters supported the proposed rule, one commenter was unclear as to whether the proposed rule also removed the requirement to record accomplishment of safety directives, and one commenter stated the proposed rule does not enhance safety and

questioned FAA's ability to evaluate manufacturers' safety directives and issue airworthiness directives.

The proposed amendment of § 91.327 to remove the requirement to comply with manufacturer's safety directives was accompanied by a corresponding revision to § 91.417 to remove the requirement to record compliance with such safety directives in the aircraft's records. However, there are still regulations prescribing recording requirements in §§ 43.9 and 43.11 that are applicable to maintenance, alterations, and inspections. Therefore, if a safety directive that involves maintenance, alteration, or inspection is complied with, applicable part 43 records must be made.

As discussed in the NPRM, aircraft owners are encouraged to continue to comply with manufacturers' safety directives to address safety concerns on their aircraft. A separate regulatory requirement to comply with manufacturers' safety directives is unnecessary because § 91.7 prohibits any person from operating a civil aircraft unless it is in an airworthy condition. Where a safety-of-flight condition exists on an aircraft, that condition would need to be corrected for the aircraft to be considered in an airworthy condition to satisfy the § 91.7 requirement. In addition, safety-of-flight conditions would need to be corrected for the aircraft to be approved for return to service after its annual condition inspection required by § 91.327(b)(2).

Compliance with manufacturer-issued safety directives is not required after the effective date of this final rule. This includes safety directives issued prior to this final rule, including those with repetitive requirements, but would not include excusing violations of §§ 91.327(b)(4) or 91.417(a)(2)(v) that occurred prior to the applicable effective date of this final rule. FAA recommends owners, operators, and maintenance providers carefully review all manufacturer safety directives and comply when

appropriate. Many safety directives may identify safety of flight or other airworthiness issues. Such issues, if present on the aircraft, would make the aircraft unairworthy. For example, a manufacturer might issue a safety directive that notifies owners of possible cracking in a certain part of the aircraft's primary structure. While the manufacturer safety directives would not be mandatory under the NPRM, if the aircraft structure is found to have the crack that the safety directive highlights, then the aircraft is unairworthy, and the crack must be repaired before the aircraft can be approved for return to service and subsequently operated.

Furthermore, § 43.13 requires each person performing maintenance to use methods, techniques, and practices prescribed in the current manufacturer's maintenance manual; Instructions for Continued Airworthiness prepared by its manufacturer; or other methods, techniques, and practices acceptable to the Administrator. In the previous example, the repair instructions in a manufacturer issued safety directive would be considered an acceptable method to repair the crack; though there may be other methods, techniques, or practices acceptable to the Administrator that could be used to repair the crack. However, if FAA issued an AD regarding the unsafe condition of possible cracking, and the AD refers to repairing any actual crack found per the safety directive, then compliance with the safety directive would be mandatory unless an alternate means of compliance under § 39.19 was approved by FAA and used.

Given these existing and continuing safety-of-flight requirements, FAA has determined there is no degradation in safety from the proposed revision to § 91.327(b)(4). It is important to note that manufacturers of light-sport category aircraft are still required to implement and maintain a documented continued operational safety program that monitors and resolves in-service safety of flight issues. The program must include

provisions for the issuance of safety directives and a process for advance notice to FAA and owners of discontinuance of its continued operational safety program or any transfer of the program to another responsible party, per § 21.190(d)(8). Therefore, owners will continue to be notified of safety issues through manufacturer issued safety directives and are responsible to ensure their aircraft are airworthy. FAA notes that though it does not typically issue ADs for non-type-certificated products, FAA policy[290] includes monitoring and analyzing safety data for light-sport category aircraft to determine if FAA action is required, including the issuance of an FAA AD.

Therefore, in this final rule FAA is adopting the NPRM proposal to remove the § 91.327(b)(4) requirement for an owner or operator of a light-sport category aircraft to comply with safety directives issued by the aircraft manufacturer. FAA is also adopting the NPRM proposal to amend § 91.417(a)(2)(v) to remove the corresponding record keeping requirement for manufacturer-issued safety directives.

In the NPRM, FAA proposed replacing § 91.327(b)(4) with a requirement that prohibits operation of a light-sport category aircraft unless the aircraft has demonstrated compliance with the applicable requirements of part 36. As discussed in section IV.N, the holder of the airworthiness certificate, rather than the pilot of an aircraft, is fundamentally responsible for ensuring that their aircraft complies with airworthiness requirements. In addition, section IV.N discusses that this final rule makes compliance with part 36 for light-sport category aircraft voluntary. Based upon this, FAA has removed this requirement from § 91.327(b)(4). As a result of the removal of existing language in § 91.327(b)(4), this final rule renumbers the remaining subparagraphs (5), (6), and (7) as (4), (5), and (6).

2. TBO/Time Limits/Life Limited Parts

FAA received twelve comments asking for clarification on whether the owner or operator of light-sport category aircraft is required to comply with manufacturer mandated intervals such as engine time-between-overhaul (TBO) intervals or component time-life intervals that have not been explicitly FAA-approved. The NPRM did not make any proposals related to TBO intervals or component time-life intervals. As such, comments that were received requesting clarification of these topics or suggestions of additional regulatory revisions are outside the scope of this rulemaking. FAA has existing guidance that explains the requirements for meeting manufacturer's specified TBOs or other time-life intervals.[291]

3. Minor Repairs and Minor Alterations

In the NPRM, FAA proposed to revise § 91.327(b)(5), renumbered to § 91.327(b)(4) in this final rule, to add repairs to the requirement that already included alterations. The proposed amendment to § 91.327(b)(5) was to allow for minor repairs and minor alterations to be accomplished without authorization from the manufacturer or a person acceptable to FAA. In addition, FAA proposed to remove language from § 91.327(b)(5) regarding alterations "accomplished after the aircraft's date of manufacture" because aircraft must have been manufactured to engage in flight operations. Finally, FAA proposed language that repairs and alterations meet FAA-accepted consensus standards that are specified in the manufacturer's statement of compliance that was originally submitted to FAA at the time of aircraft certification.[292] This amended language provides that, though consensus standards may change over time, the aircraft is only required to meet the consensus standards identified on the manufacturer's statement of compliance submitted at the time of original airworthiness certification.

After additional review, FAA finds the NRPM proposal to include the term "minor" prior to "repair" and "alteration" in proposed § 91.327(b)(5) unnecessary because it implies that the language retained from the existing regulation, regarding meeting the consensus standards identified in the statement of compliance, is not required for major repairs and major alterations. In accordance with § 21.181(a)(3), a special airworthiness certificate in the light-sport category is effective as long as the aircraft meets the eligibility criteria for the issuance of an airworthiness certificate in the light-sport category specified in § 21.190(b). Therefore, the requirement to comply with the consensus standards identified in the statement of compliance submitted to FAA applies regardless of whether the alteration or repair is major or minor. Removing the word "minor" in the final rule from proposed § 91.327(b)(5) does not change FAA's intent from what was proposed in the NPRM and clarifies that all repairs and alterations must be made in accordance with applicable consensus standards.

FAA received five comments from nine commenters related to the proposed changes to proposed § 91.327(b)(5), renumbered to § 91.327(b)(4) in this final rule. EAA, AOPA, NATA, NBAA, GAMA, the Light Aircraft Manufacturers Association, and two other commenters are in support of the proposed changes. One commenter is opposed to allowing minor repairs and minor alterations to be accomplished without manufacturer approval.

Five of the supporting commenters discussed the need for guidance related to understanding requirements around minor alterations and minor repairs. FAA intends to develop guidance in an Advisory Circular (AC) on the maintenance requirements for light-sport category aircraft, including guidance for understanding and applying requirements concerning minor repairs and minor alterations.

Van's Aircraft commented that the full definition of what is minor and what is major is unclear and the current requirement for manufacturers is that items included within the maintenance manual are minor and those not included in the maintenance manual are major. It asked if there are any conflicts with § 43.1 that need to be resolved and asked for further clarification on the definition of what is minor, and what changes FAA would propose within the ASTM standards to support this.

FAA disagrees that the definition of major vs. minor is unclear. FAA has long defined these terms in § 1.1. FAA believes Van's Aircraft's description of which items are minor or major is based on, or in line with, terminology definitions contained in consensus standards such as ASTM F2483-18e1.[293] These consensus standard definitions appear to have been made without consideration of the § 1.1 definitions for major and minor repair and major and minor alteration, upon which FAA relies on when using these terms. The definition for "consensus standard" included in § 1.1 prior to this final rule required a consensus standard to include standards for the identification and recording of major repairs and major alterations. However, the definition did not imply that consensus standards should redefine "major" repair or alteration, as FAA has already defined these terms. The language directing "standards for identification and recording of major repairs and alterations" does not extend to redefining the terms themselves. When FAA uses the terms "major repair" or "major alteration," such as used in the § 1.1 "consensus standard" definition, the regulation refers to what FAA has defined. Though the comment from Van's Aircraft questioned whether there are conflicts with § 43.1, the commenter did not identify specific concerns. FAA has reviewed § 43.1 and believes there are no conflicts in § 43.1 requirements for light-sport aircraft regarding major repairs or major alterations.

Finally, Van's Aircraft asked for further clarification on the definition of what is minor, and what changes FAA would propose within the ASTM standards to support this. The above discussion clarifies FAA's position on major vs. minor. FAA declines to recommend ASTM revisions in this preamble as FAA provides comments and recommends changes to ASTM standards when those documents are submitted to FAA for acceptance or approval.

While one commenter opposed allowing minor repairs and minor alterations to be accomplished without manufacturer authorization, FAA believes that requiring manufacturer authorization for minor repairs and minor alterations is unnecessary. As pointed out by AEA/ARSA and other commenters, minor alterations and minor repairs do not appreciably affect weight, balance, structural strength, performance, powerplant operations, flight characteristics, or other qualities affecting airworthiness. Thus, there is low safety risk associated with the accomplishment of such alterations or repairs. It is unreasonable to believe that an aircraft will remain exactly as it was when it was manufactured following operation or over a period of time, as aircraft accumulate a certain amount of wear and tear, or other minor defects. Minor repairs and alterations will likely need to be made to all aircraft following commencement of flight operations over time. Allowing minor repairs and alterations to occur without manufacturer authorization parallels requirements currently in place for aircraft designed to CAR 3 and part 23 standards and issued a standard category airworthiness certificate. There is little reason to hold light-sport category aircraft to a different or higher standard for minor repairs and minor alterations when such repairs or alterations, by definition, do not appreciably affect weight, balance, structural strength, performance, powerplant operation, flight characteristics, or other qualities affecting airworthiness of the aircraft.

One commenter is concerned that a lack of manufacturer authorization of minor alterations would increase the burden on prospective buyers to find an aircraft that has not been altered other than as authorized by the manufacturer. Section 43.9(a) requires a maintenance record entry be made for all maintenance and alterations, and § 91.417(b) requires those record entries to be retained until the work is repeated or superseded by other work or for 1 year after the work is performed. In many, if not most, instances, though not required by § 91.417(b), maintenance record entries are retained indefinitely as a part of the aircraft's records. Prospective buyers of any aircraft certificated in any category have the burden of determining the extent of maintenance, repairs, and alterations performed on an aircraft prior to purchasing. FAA believes the reduction of burden on actual aircraft owners and operators by not having to obtain manufacturer authorization for minor alterations and repairs outweighs any additional burden potential aircraft owners may have to determine if minor repairs or alterations were made. As previously stated, wear and tear on operational aircraft is to be expected, along with repairs and alterations to maintain the aircraft. In addition, the same requirements apply to aircraft holding standard airworthiness certificates and have not resulted in safety issues.

FAA is adding the language "or approved" to proposed § 91.327(b)(5), renumbered to § 91.327(b)(4) in this final rule, in reference to the consensus standards that are applicable. This change is to conform with changes in part 22 that reflect that, while most consensus standards are accepted by FAA, some consensus standards are approved by FAA.

In summary, this final rule adopts proposed § 91.327(b)(5) as § 91.327(b)(4), with minor changes described previously.

4. Major Repairs and Major Alterations

In the NPRM, FAA proposed to add major repairs to the requirements in § 91.327(b)(6), renumbered to § 91.327(b)(5) in this final rule, which already included major alterations. In addition, the NPRM proposed to remove the language "to an aircraft product produced under a consensus standard."[294] In the proposed rule, FAA retained the language that would require major repairs and major alterations to be authorized by the manufacturer (or a person acceptable to FAA) and for major repairs and major alterations to be performed and inspected[295] in accordance with maintenance and inspection procedures developed by the manufacturer (or a person acceptable to FAA). FAA received one comment from five commenters, including EAA and ARSA, agreeing with the proposed addition of "repairs" to the language in § 91.327(b)(6).

After additional review, FAA believes it is not appropriate to remove the language "to an aircraft product produced under a consensus standard" from § 91.327(b)(6) as proposed. Though no comments were received on this proposed change, this language differentiates between requirements for light-sport aircraft products produced under a consensus standard versus those products produced under an FAA-approval (i.e., such as a type-certificate, production certification, parts manufacturer approval (PMA), or technical standard order (TSO)), with respect to the performance and recording of major repairs and major alterations. The existing regulations require that when type-certificated products installed on a light-sport aircraft are subject to a major repair or major alteration, then those products must be repaired or altered in accordance with part 43 requirements applicable to a type-certificated product, to include recording requirements for major repairs and major alterations. This is because such products could be removed from a light-sport category aircraft and subsequently installed on a type-

certificated or other aircraft to which all of part 43 applies. In § 43.1(d), light-sport category aircraft are excepted from the recording requirements applicable to other aircraft to which part 43 applies, but only with respect to products not produced under an FAA approval. Specifically, the requirement to use FAA Form 337 (under §§ 43.5(b) and 43.9(d)) and to disposition that form in accordance with appendix B of part 43 does not apply when a major repair or alteration is performed on a light-sport category aircraft or product that was not produced under an FAA approval.

In summary, in the final rule FAA is adopting the NPRM proposed amendment to § 91.327(b)(6), renumbered as § 91.327(b)(5), but will retain the language "to an aircraft product produced under a consensus standard."

5. Other Amendments to § 91.327

In the NPRM, FAA proposed a change to § 91.327(b)(1) regarding how maintenance on a light-sport category aircraft must be performed. Specifically, the NPRM replaced the language "a person" acceptable to FAA with "other maintenance and inspection procedures" acceptable to FAA. The intent of that proposal was to align light-sport category maintenance requirements with those found in § 43.13(a), which provides an option of either the manufacturer's instructions or other methods, techniques, and practices acceptable to the Administrator. However, FAA found the proposed change was not explained in the NPRM preamble and that such a change is not necessary because § 43.13(a) already provides the option for maintenance to be conducted in accordance with either the manufacturer's instructions, or other methods, techniques, and practices acceptable to the Administrator.

FAA received four comments from seven commenters, including AEA/ARSA, regarding this provision. However, the comments were not related to the proposed

regulatory text changes. Their comments were directed at existing regulatory language in § 91.327(b)(1) that was not proposed for change, as related to the applicable provisions of part 43. One commenter asked why a type-certificated aircraft can be repaired or maintained with part 43, yet a simple light-sport aircraft cannot. Similarly, another commenter stated the regulations should absolutely allow part 43 for acceptable materials repairs, modifications, parts, etc., since there is no support for repair or modification authorizations if a light-sport manufacturer goes out of business.

FAA agrees with commenters that light-sport aircraft should and, in fact, must be repaired or maintained in accordance with applicable provisions of part 43. Section 91.327 specifically requires that a light-sport category aircraft be maintained in accordance with the applicable provisions of part 43; this includes the option to use acceptable methods, techniques, or practices acceptable to the Administrator under § 43.13(a). Section 43.1 explains the applicability of part 43; light-sport category aircraft are excepted from certain requirements related to the recording of major repairs and alterations on products not produced under an FAA approval. However, there are no other exceptions in part 43 related to light-sport category aircraft; therefore, all other provisions of part 43 apply.

EAA, AOPA, NATA, NBAA, and GAMA commenters pointed out that it is confusing and inappropriate for the regulation to require compliance with both part 43 and manufacturer maintenance and inspection procedures.

FAA disagrees that it is confusing or inappropriate that the regulations require in certain instances compliance with part 43 as well as maintenance and inspection procedures developed by the manufacturer (or a person acceptable to FAA). The regulations must be applied harmoniously, one does not override another. As discussed

previously in this section, all part 43 requirements apply to light-sport category aircraft except where specifically stated in § 43.1, Applicability. In addition, § 91.327 includes several requirements for compliance with procedures from the manufacturer or a person acceptable to FAA. Specifically, § 91.327(b)(1) requires compliance with the manufacturer's (or person acceptable to FAA) maintenance and inspection procedures. Section 91.327(b)(2) requires the annual condition inspection be performed in accordance with inspection procedures developed by the aircraft manufacturer or a person acceptable to FAA. Section 91.327(b)(6), renumbered to § 91.327(b)(5) in this final rule, requires that major repairs and major alterations be performed and inspected in accordance with maintenance and inspection procedures developed by the manufacturer or a person acceptable to FAA. Lastly, § 91.327(c) requires that a 100-hour condition inspection be performed in accordance with inspection procedures developed by the aircraft manufacturer or a person acceptable to FAA.

While § 91.327 specifies when an annual condition inspection (under § 91.327(b)(2)) or a 100-hour inspection (under § 91.327 (c)) must be done, the regulation does not require the aircraft to be inspected using a checklist that meets part 43 appendix D. Rather, § 91.327 requires compliance with manufacturer inspection procedures in terms of the appropriate items that must be inspected. At the same time § 91.327 requires persons performing the inspections to use the manufacturers inspection procedures; there is no other minimum inspection standard for inspections on light-sport category aircraft, such as the content in appendix D to part 43 applicable to aircraft issued a standard airworthiness certificate. If the regulation omitted the inspection procedures requirement, then the inspections would have no performance requirement (i.e., the inspection must be done, but there would be nothing stating what must be inspected).

Similarly, major repairs and major alterations performed on light-sport category aircraft do not require FAA to approve the data for such modifications. Instead, FAA regulations permit the manufacturer (or a person acceptable to FAA) to authorize major repairs and major alterations. Here too, FAA leaves it to the aircraft manufacturer or an FAA acceptable person to define the maintenance and inspection procedures that apply to the major repair or major alteration. The language in § 91.327 subsequently requires that a person must use those maintenance and inspection procedures when performing or inspecting the major repair or major alteration.

For all these reasons, the language in § 91.327(b)(1) stating "and inspection and maintenance procedures…" is appropriate and clear.

AEA/ARSA stated the maintenance and continued airworthiness of light-sport aircraft is the most restrictive requirement in aviation because of how major repairs and alterations are defined and the requirement for the manufacturer's approval. Commenters also point out that standard category aircraft are held to the maintenance performance standards in § 43.13(a), and it is inconsistent for a light-sport category aircraft to be held to a more restrictive maintenance performance standard.

The definition of major repairs and major alterations is found in § 1.1. There is no difference in applying these definitions to light-sport category aircraft, and therefore, FAA disagrees that these aircraft are held to a more restrictive standard in this regard.[296]

Further, FAA disagrees that light-sport category aircraft are held to a more restrictive standard for maintenance as stated by the commenter. As previously discussed, light-sport category aircraft must be maintained in accordance with part 43; however, where § 91.327 requires the use of maintenance or inspection procedures developed by the manufacturer or a person acceptable to FAA, then those procedures must be used.

These requirements are similar to how the regulations apply to aircraft issued a standard airworthiness certificate, on which inspections must be performed in accordance with the scope and detail of appendix D of part 43. Similarly, where major repairs and major alterations to light-sport category aircraft must be inspected and maintained using maintenance and inspection procedures developed by the manufacturer or a person acceptable to FAA, aircraft holding standard airworthiness certificates must be inspected and maintained using the instructions for continued airworthiness that are included as a part of FAA Form 337 approved by the Administrator. In addition, § 91.327 has always allowed major repairs and major alterations on light-sport category aircraft to be authorized by either the manufacturer or a person acceptable to FAA who is not the manufacturer. This is less restrictive than requirements for aircraft holding standard airworthiness certificates, which must have FAA approval of the data used for performing major repairs and major alterations.

In summary, the final rule is not revising § 91.327(b)(1), except to conform the name of the repairman certificate (light-sport) as discussed in section IV.I.1.

6. Third-Party Modifications

In response to the NPRM, FAA received seven comments related to the regulatory requirements around the performance of "third-party modifications" on light-sport category aircraft. By "third-party modification," FAA understands the commenters to mean a major repair or major alteration to the aircraft that was not part of the original manufacturer's design, and which was not authorized by the original manufacturer.[297] Similarly for this discussion, by "third-party modifier," FAA understands the commenters to mean a person, other than the original aircraft manufacturer, who authorizes a third-party modification. Use of such third-party modifications on aircraft would have to meet

the applicable regulatory requirements, including § 91.327(b)(6), renumbered as § 91.327(b)(5) in this final rule, requiring each major repair or major alteration to an aircraft product produced under a consensus standard to be authorized by the manufacturer or a person acceptable to FAA. The term third-party modifier does not refer to maintenance providers such as light-sport repairmen, mechanics, or repair stations solely because that person is performing the work of incorporating a repair or alteration onto the aircraft that a third-party modification consists of, or who are otherwise using authorized inspection or maintenance procedures to perform work.

AEA/ARSA stated the maintenance and continued airworthiness of light-sport aircraft is the most restrictive requirement in aviation because of the definition of major repairs and alterations and FAA's delegation of approval to only the original equipment manufacturer. These commenters state that the proposed rule disregards the negative impact on design, certification, and installation of retrofit technologies, as well as the aviation maintenance service industry. Another commenter pointed out that manufacturers may not be available or amenable to minor updates to an aircraft. One other commenter stated the general understanding is that only the original aircraft manufacturer can approve a major modification to a light-sport category aircraft. That commenter further stated, if an aircraft manufacturer refuses to approve a change to an aircraft, the only path forward for the owner/operator to "legally" modify a light-sport category aircraft is to put the aircraft into the experimental category, which in turn has restrictions on certain aircraft operations. Van's Aircraft stated the light-sport industry has a major gap in the area of major repairs and alterations.

GAMA commented that currently there is no practical way to support customers who request upgrades or different avionics solutions that are not supported by the original

aircraft manufacturer. GAMA believes that the industry needs a practical means for third parties to perform major alterations to LSA and supports the provision for "a person acceptable to FAA" to authorize such alterations. EAA, AOPA, NATA, NBAAA, GAMA, Van's Aircraft, and another commenter encouraged FAA to make greater use of the "a person acceptable to FAA" clause in the regulation to allow greater third-party alterations and repairs to light-sport aircraft when those alterations and repairs meet applicable standards.

GAMA stated the original light-sport aircraft rule clarified the intent of the phrase "a person acceptable to FAA" applied only to minor alterations, and stated it is not clear if that same list also applies to major alterations. GAMA further stated a clear path for receiving FAA approval for major repair, alteration, or major change in type design is required to support the life cycle of part 22 aircraft and to afford the ability to add safety enhancing technology or to meet future operational mandates, without reliance upon the manufacturer.

Van's Aircraft expressed three main concerns with third-party maintenance from a manufacturer perspective. The first concern stated is that manufacturer liability issues may be caused by providing an alternate path to manufacturer approval. Van's second concern is the marketability of light sport aircraft to flight schools, and that manufacturers need an alternative path for major repairs and alterations that allows aircraft in a flight school to remain viable indefinitely and independent of the manufacturer. The third concern is that there should be a check gate to ensure that third parties acting independently would be held to the same level of rigor as a manufacturer who signs an FAA form 8130-15, Statement of Conformity. For example, Van's Aircraft asserted that a third-party modifier should need the same training as that required of a

manufacturer, should consider all the safety issues related to the current major repair and alteration (MRA) process, should notify a manufacturer, and should maintain a continued operational safety program to maintain their repairs and alterations over time. Van's Aircraft also suggested three ways to address this concern: (1) that a third-party be required to submit an amended statement of compliance form as proposed in § 21.190(e) for aerial work, which would provide a record of the aircraft modification for future reference by a manufacturer or a future third-party planning a subsequent alteration; (2) utilize the existing and ongoing ability of a manufacturer to issue a safety directive against a potential alteration; and (3) that FAA should work with industry to develop a solution within the consensus standard process. Van's Aircraft pointed out that the ASTM F37 committee is currently working on a third-party alteration standard and asked that FAA continue to provide support and pressure as necessary to enable the committee to develop a working solution within the consensus process.

In general, the above comments request that FAA provide additional guidance and regulations with respect to third-party modifications and facilitate increased use of the "a person acceptable to FAA" clause in § 91.327. Because § 91.327(b)(5) allows for "a person acceptable to FAA" to authorize major repairs or major alterations in lieu of a manufacturer authorization, FAA believes that the existing regulations are sufficient for allowing third-party modifications. In addition, much of the comments in this regard are outside of what the NPRM proposed or are more general expressions of concern rather than specific recommendations related to the NPRM. The requests for additional rulemaking are outside the scope of this rule and would require separate notice and comment rulemaking. However, FAA agrees that additional guidance would benefit the public. FAA intends to revise existing guidance to provide further information related to

third-party modifications. Responses to some specific assertions from the comments are discussed in the following paragraphs.

FAA disagrees with commenters understanding that only the original manufacturer can authorize major repairs or major alterations to light-sport category aircraft. In the NPRM, FAA referred back to the 2004 final rule[298], where FAA clarified that "a person acceptable to FAA" includes: (1) the manufacturer that issued the statement of compliance, (2) any person who has assumed, and is properly exercising, the original manufacturer's responsibility for carrying out the continued airworthiness procedures described in the consensus standard, (3) the holder of an FAA-approved TSO authorization, PMA, type certificate (TC), or supplemental type certificate (STC) for a product or part installed on the aircraft, and (4) any person authorized by the manufacturer to produce modification or replacement parts in accordance with the applicable consensus standard addressing ''qualification of third-party modification or replacement parts.'' FAA finds that there may be other persons acceptable to FAA. FAA intends on developing an Advisory Circular on the maintenance requirements for light-sport category aircraft, which will include further guidance on third-party modification and persons acceptable to FAA as used in § 91.327.

Regarding GAMA's comment that the original light-sport aircraft rule clarified the intent of this phrase "a person acceptable to FAA" only applied to minor alterations, FAA points out that, prior to this final rule, § 91.327(b)(5) applied to all alterations (minor and major), while § 91.327(b)(6) applied to major (not minor) alterations. Under this final rule, § 91.327(b)(5) and (6) were renumbered to § 91.327(b)(4) and (5) and do not require that minor repairs and minor alterations have authorization by the manufacturer or a person acceptable to FAA, nor are minor repairs and minor alterations

required to be performed and inspected in accordance with maintenance procedures developed by the manufacturer or a person acceptable to FAA.[299]

In addition, the suggestion from Van's Aircraft to add regulations requiring a third-party to submit an amended statement of compliance form, similar to that proposed in § 21.190(e) for aerial work, cannot be implemented without additional notice and comment rulemaking.

7. Owner-Pilot Preventive Maintenance

The proposed rule and existing regulations allow a sport-pilot to perform preventive maintenance on light-sport category aircraft owned or operated by that sport pilot. However, the regulations do not allow sport-pilots to perform preventive maintenance on aircraft issued a standard airworthiness certificate, but which a sport pilot is permitted to operate in accordance with § 61.316.

In response to the NPRM, FAA received eleven comments related to pilots and aircraft owners performing preventive maintenance on aircraft that a sport-pilot is permitted to operate. Commenters request that sport-pilots be permitted to perform preventive maintenance tasks on all aircraft that a sport-pilot is permitted to operate, including aircraft holding standard airworthiness certificates that meet the performance limits and design requirements of § 61.316. In general, commenters would like FAA to revise § 43.3(g), to allow sport pilots to perform preventive maintenance on any aircraft the sport-pilot owns or operates.

One of the eleven commenters is against allowing owners to perform their own maintenance and stated some owners are not mechanically aware enough to notice a future problem. Four commenters noted the difference in what a private pilot is permitted to do compared to a sport pilot. One of these commenters stated he has a lot of

maintenance experience but is not permitted to do maintenance tasks on his aircraft that a private pilot with zero maintenance skills can do; that commenter further stated the only difference between himself and a private pilot is the medical. Another commenter points out there is no difference in training between sport pilots and private pilots and states the medical is not justification to limit ground maintenance. Three commenters suggest establishing an endorsement process to be allowed to perform maintenance tasks on aircraft owned by the pilot. Another three commenters suggest allowing pilots to perform maintenance after the pilot has had training, such as an owner maintenance course. One commenter mentions the economic burden placed on him to have oil and tire changes completed by a certificated mechanic.

When the sport-pilot certificate was created in 2004, FAA discussed that the decision to prohibit sport pilots from performing maintenance on type-certificated aircraft is because those pilots do not have the same level of experience as persons who currently perform preventive maintenance on type-certificated aircraft. This is evidenced in the differences between, for example, the current private pilot airplane ACS[300] and the PTS[301].

Amending § 43.3(g) to allow sport pilots to perform preventive maintenance on type-certificated aircraft is outside the scope of this rulemaking. Such a change was not proposed in the NPRM, and considering such changes would require notice and the opportunity for comment and would delay the issuance of this final rule and the realization of its intended benefits. Therefore, this final rule does not make changes related to pilot preventive maintenance privileges contained in part 43.

8. Downgrades of Type-Certificated Aircraft to Light-Sport

FAA received comments and questions from several commenters who refer in one way or another to an aircraft that was originally certificated with a standard airworthiness certificate (§ 21.183) and subsequently recertificated as a light-sport category aircraft (§ 21.190) or experimental operating light-sport category (§ 21.191). Commenters questioned equipment installation eligibility and maintenance and inspection requirements on a former standard classification aircraft that was downgraded to the light-sport category. Other commenters suggest such a recertification be allowed so light-sport repairmen could then perform the required maintenance and inspection on those aircraft. GAMA specifically proposed that FAA allow legacy certified aircraft (Part 23 or Civil Aviation Regulation (CAR) part 3) that fall within light-sport aircraft guidelines to be changed to an experimental light-sport aircraft. GAMA contended that allowing owners to obtain this level of airworthiness certificate would create a path for owners to keep these older aircraft functional and updated with modern avionics or other parts that may no longer be available. GAMA further stated it would also reduce operating costs by allowing owner maintenance after taking a light-sport repairman training course.

As more fully discussed in section IV.F.6, under current § 21.190(b)(2), now relocated to § 22.100(a)(6) in this final rule, aircraft that were previously issued a standard airworthiness certificate are not eligible for certification as light-sport category aircraft. Similarly, aircraft with a standard airworthiness certificate are not eligible to be issued an experimental airworthiness certificate for the purpose of operating light sport aircraft since eligibility for that experimental airworthiness certificate is limited to aircraft that were previously issued a special airworthiness certificate under § 21.190. While the comments cite various rationales in support of such airworthiness certificate changes, these rationales do not speak to the underlying basis for the different categories,

or to the specific experimental purposes. To be issued any experimental airworthiness certificate for any purpose, an aircraft must meet the applicable requirements of § 21.191. In addition, as explained in the 2004 final rule for current § 21.190(b)(2), allowing aircraft with a standard or primary category airworthiness certificate to obtain a light-sport category airworthiness certificate was seen as an unnecessary burden on manufacturers, operators, and FAA.[302]

While GAMA suggested that allowing aircraft holding standard airworthiness certificates to be recertificated with an experimental airworthiness certificate for operating light-sport aircraft would allow owners to make these aircraft functional, there is no evidence that safety would be either increased or maintained at current levels. As previously mentioned, experimental aircraft are not required to be maintained in accordance with part 43, would only require an annual condition inspection,[303] and would no longer be required to meet any design standards at all. FAA has recognized the challenges that owners and operators of vintage aircraft face and provides guidance for substantiating parts or materials substitutions in multiple documents.[304]

Aircraft holding a standard airworthiness certificate, such as the legacy aircraft that commenters are referring to, are higher on the safety continuum than a light-sport category aircraft. Therefore, FAA does not agree with the commenters' recommendations to allow legacy aircraft holding a standard airworthiness certificate to be recertificated with a "lower" light-sport category or experimental operating light-sport airworthiness certificate, as suggested by commenters.

Finally, the NPRM did not propose any changes to part 21 regulations for the purpose of allowing aircraft holding standard airworthiness certificates to downgrade into the light-sport category or the experimental purpose for operating light-sport aircraft. Any

new changes would be out of scope of this rule and should be accomplished with appropriate notice and opportunity to comment.

Based upon these reasons, FAA disagrees with commenters' recommendations to allow an aircraft that was originally certificated with a standard airworthiness certificate to be subsequently recertificated as either a light-sport category aircraft under § 21.190 or experimental operating light-sport category aircraft under § 21.191.

9. Changes to Certificated Mechanic Privileges

In the NPRM, FAA discussed that language in §§ 65.85(b) and 65.87(b) did not align with the proposed § 91.327(b)(6), renumbered as § 91.327(b)(5) in this final rule. This misalignment was because current §§ 65.85(b) and 65.87(b) did not require a mechanic to verify that a major repair or alteration was authorized by the manufacturer or a person acceptable to FAA before approving an airframe or powerplant for return to service. Performing the major repair or major alteration in accordance with instructions developed by the manufacturer or a person acceptable to FAA may not sufficiently verify the aircraft or engine meet the requirement for the major repair or major alteration to be authorized by the manufacturer (or a person acceptable to FAA). Therefore, in the final rule FAA is adopting the NPRM proposed amendments to §§ 65.85(b) and 65.87(b).

One commenter noticed that the proposed changes to § 65.87(a) failed to correct "approve and return it to service" with "approve for return to service" as described in the NPRM. In this final rule, FAA has corrected the clerical error to § 65.87(a) and adopted the language change proposed.

10. Conforming Amendments and Other Comments

a. Conforming Amendment to § 43.1

The NPRM proposed a conforming amendment to § 43.1 based on proposed § 21.191, which removed paragraph (i)(3) of § 21.191 in its entirety. The NPRM conforming amendment was necessary because § 43.1(b) states what aircraft to which part 43 does not apply and refers to § 21.191 regulatory language that was being amended in the NPRM. However, as discussed in section IV.L, this final rule will retain § 21.191(i)(3) but will not issue airworthiness certificates under that regulation after [INSERT DATE 365 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]. In addition, FAA is adding new § 21.191(l) for issuance of airworthiness certificates to operate a former light-sport category aircraft. Just as part 43 does not apply to former light-sport category aircraft issued an experimental airworthiness certificate under § 21.191(i)(3), part 43 does not apply to former light-sport category aircraft issued an experimental airworthiness certificate under new § 21.191(l). The titles and requirements of the § 21.191(l) experimental purpose remain unchanged from the NPRM; the only difference being its new paragraph in § 21.191 for this final rule. Therefore, in this final rule, § 43.1(b)(2) will retain the exception for aircraft for which FAA has issued an experimental airworthiness certificate under the provisions of § 21.191(i)(3) and is amended to exclude aircraft issued an experimental airworthiness certificate under § 21.191(l) from part 43 requirements.

This final rule also makes a conforming change to § 43.1(b)(1) and (2) by changing "experimental certificate" to "experimental airworthiness certificate" to remain consistent with the terminology of § 21.191 and the explanation in section IV.I.2 of the NPRM that experimental certificates are experimental airworthiness certificates. FAA did not receive any comment on this terminology change for § 21.191.

b. Other Comments and Changes Related to Maintenance

NAVAIR noted the title of part 43 contained a spelling error in the NPRM; the word “preventitive” should be “preventive." FAA did not intend to change the title of part 43 and this was a clerical error in the NPRM. FAA agrees with the commenter and has corrected this error in the final rule.

One commenter pointed out that the proposed language in § 43.13(a) changed from "shall" to "must" with no explanation for the change. FAA agrees with the commenter and has corrected the final rule language to retain “shall” as used in § 43.13(a) prior to this final rule.

In the NPRM, FAA proposed to remove the paragraph title from § 43.13(c) to ensure consistency with § 43.13(a) and (b), which do not use headings. In addition, minor language changes were proposed to appropriately cross reference to parts 121, 135, and 129 of title 14, chapter I. No comments were received on the proposed changes; therefore, the changes are adopted in this final rule.

Van’s Aircraft commented that a light-sport repairman, appropriately rated mechanic, or an appropriately rated repair station would be able to perform minor repairs and alterations on light-sport category aircraft and asked what training has been put in place to ensure that mechanics and repair stations understand the consensus standards. Van’s Aircraft also stated a concern related to Letters of Authorization (LOAs) being used for major alterations when consensus standards use Major Repair and Alterations (MRA) forms. Van’s Aircraft questioned that if an LOA is erroneously used for a major alteration, how will FAA ensure mechanics and repair stations understand the consensus standards.

The Mechanic ACS is the standard for both mechanic and light-sport repairmen (with a maintenance rating) training content. The Mechanic ACS includes subject I.

Regulations, Maintenance Forms, Records and Publications. Element AM.I.I.K8 requires mechanics and light-sport repairmen know the regulatory framework, including general subject matter of the parts of 14 CFR relevant to aircraft maintenance and mechanics. Therefore, these certificate holders are expected to know the regulatory framework, which includes the regulatory framework around consensus standards related to performing maintenance on light-sport category aircraft. For example, a mechanic must understand that some aircraft are built to design standards in part 23. The expectation is not for mechanics to memorize each subparagraph of part 23, but to understand how it relates to aircraft design and maintenance overall. Similarly, FAA expects mechanics to understand that light-sport aircraft must comply with part 22, which requires that the aircraft be designed to meet a consensus standard accepted by FAA.

Once a person is a certificated mechanic or light-sport repairman, FAA notes that the regulations provide ongoing requirements that these certificated persons must meet to exercise the privileges of their certificate. Specifically, §§ 65.81(a), (b) and 65.109(c) prohibit supervision or approval for return to service unless the certificate holder has satisfactorily performed the work before at an earlier date, and unless the certificate holder understands the current instructions of the manufacturer, and the maintenance manuals, for the specific operation concerned. The regulations put responsibility on the certificate holder to ensure they are qualified to perform specific tasks, but the regulations do not mandate specific training. In addition, while a consensus standard can indicate recommended training for a task, the consensus standard cannot mandate additional training requirements that are beyond what applicable 14 CFR regulations require. However, manufacturer recommended training would be one way a certificate holder

could meet the requirements of §§ 65.81 or 65.109(c) to exercise the approval for return to service privileges of their certificate.

An appropriately rated part 145 repair station performing work on light-sport category aircraft must comply with regulations that include training requirements for their personnel. Specifically, § 145.151(c) requires each certificated repair station to ensure it has enough employees with the training or knowledge and experience in the performance of maintenance, preventive maintenance, or alterations authorized by its repair station certificate and operations specifications to ensure all work is performed in accordance with part 43. In addition, § 145.163 requires a repair station to have an employee training program approved by FAA that ensures each employee assigned to perform maintenance, preventive maintenance, or alterations, and inspection functions can perform assigned tasks. Therefore, training requirements are already in place in part 145 for an appropriately rated repair station performing work on light-sport category aircraft to include pertinent training material that would ensure an understanding of the consensus standards specific to the work the repair station performs. The expectation is that a repair station will develop or revise its training program, as appropriate, for the work performed under the repair station's ratings.

One commenter wanted to continue to allow experimental aircraft builders to do their own condition inspections, maintenance, etc., and recommended initiating and promoting training and certification programs to facilitate the same. FAA notes that inspection and maintenance requirements for aircraft that hold an experimental airworthiness certificate for the purpose of operating amateur-built aircraft (in accordance with § 21.191) remain unchanged and were not a part of this rulemaking. The repairman certification requirements and process for repairmen certificated in accordance with

§ 65.104 (Repairman certificate – experimental aircraft builder) also remain unchanged. As such, these recommendations are outside the scope of this rulemaking.

AEA/ARSA commented that aircraft that are used in commercial operations to include flight training and aerial work must not be exempt from § 43.1(d), but failed to provide any reason, rationale, data or other information to justify or support their recommendation. Section 43.1(d) only exempts light-sport category aircraft from the recording requirements related to FAA form 337, and only when the major repair or major alteration did not involve a product produced under an FAA approval. Section 43.1(d) does not exempt any aircraft based on the type of operations it is conducting. The NPRM did not propose any changes to the applicability of § 43.1(d) and any new change should be accomplished with appropriate notice and comment. Given this, FAA disagrees with implementing this recommendation in this final rule.

c. Definition of "Current" as it Relates to ASTM Standards

One commenter stated while it has been longstanding FAA policy that aircraft only have to be maintained to the standards that were in force at the time of certification, the commenter has encountered issues in the field with maintaining foreign-manufactured aircraft whose manufacturers assume that subsequently approved ASTM standards are retroactive. The commenter suggested that this policy should be codified, or at least placed in an advisory circular, clearly stating policy specifically in regard to light-sport category aircraft to eliminate confusion.

The final rule adopts § 91.327(b)(5), renumbered as § 91.327(b)(4) in this final rule. This language clarifies that repairs and alterations to an aircraft must meet the applicable and current FAA-accepted or approved consensus standards specified in the

aircraft manufacturer's statement of compliance that was submitted with the application for the original airworthiness certificate for that aircraft.

11. Out of Scope Maintenance Comments

Two commenters suggested that FAA allow EAB aircraft to be certificated in the experimental light-sport category, to allow owners to take the 2-day repairman certificate (light-sport) inspection rating course and conduct their own condition inspections. An EAB aircraft is not eligible for an experimental airworthiness certificate under § 21.191(i), (k) (kit-built light-sport aircraft) or (l) (former light-sport category aircraft) because those aircraft do not meet the requirements to hold those airworthiness certificates. However, as discussed in section IV.I.10.b, FAA is expanding the privileges of light sport repairman certificate holders to include conducting the condition inspection on an EAB aircraft certificated under § 21.191(g). For example, a person who meets § 65.107(b), which requires completion of a 16-hour inspection rating training course, would be eligible for a repairman certificate (light-sport) with privileges to conduct the condition inspection on an EAB aircraft owned by the certificate holder and that is in the category of aircraft for which the certificate holder was trained.

One commenter suggested that FAA allow experimental engines to be put on part 23 aircraft and added that requiring those experimental engines to meet industry consensus standards would be acceptable. The commenter asserted this would create newer, safer powerplants for legacy aircraft, add much needed competition, and keep costs from getting exorbitant. As the NPRM did not propose rules concerning allowing experimental engines to be put on part 23 aircraft, this comment is outside the scope of this rulemaking and proposals of this nature would require appropriate notice to the public and opportunity for comment.

K. Operations

1. Operating Limitations for Light-Sport Category Aircraft

a. Aerial Work

As proposed in the NPRM, this final rule adds a new paragraph to § 91.327(a) to allow certain light-sport category aircraft to conduct aerial work operations for compensation or hire. To be able to operate under this amendment, a light-sport category aircraft must meet the applicable airworthiness certification requirements in § 21.190 relating to aerial work. Specifically, the new § 91.327(a)(3) permits certain light-sport category aircraft to conduct aerial work operations if such operations are designated by the manufacturer and specified in the aircraft's pilot operating handbook or operating limitations, as applicable, and in the manufacturer's statement of compliance for the aircraft in accordance with § 21.190.

Several commenters welcomed the proposed rule to allow aerial work operations for certain light-sport category aircraft. These commenters stated this operational expansion of light-sport category aircraft would enhance the industry. However, FAA received several comments requesting FAA define "aerial work" and requesting clarity on the types of aircraft and operations subject to the exception. For the reasons discussed subsequently, this final rule adopts § 91.327(a)(3), as proposed in the NPRM, with one minor editorial amendment to change the phrase "aircraft's statement of compliance" to "manufacturer's statement of compliance for the aircraft" for clarity and to align with the terminology used in § 21.190. In addition, as proposed in the NPRM, this final rule changes one word in the title of § 91.327 from "having" to "issued" in order to align this section with the terminology used in §§ 21.190 and 21.191.

i. Defining Aerial Work

FAA received several comments regarding the definition of "aerial work" and what types of operations should be considered aerial work. USUA, NCE Inc., SkyRunner, LLC, Doroni Aerospace, and 3F organizations as well an individual commenter recommended that aerial work operations should be broadened and defined in § 1.1. In addition, these commenters offered suggestions on how aerial work should be defined, such as including specific operational requirements, an FAA-approved comprehensive list of operations, and a delineation from commercial flights based on the purpose of the flight (i.e., for transportation or local work). USUA specifically proposed FAA define aerial work as VFR flights for compensation or hire that take off and land at the same location.

Doroni Aerospace agreed that the scope of allowable aerial work should be determined by the capability of the aircraft design and defined by ASTM consensus standards, but it suggested expanding aerial work to allow additional opportunities for manufacturers and operators, such as by including the carriage of persons or property. 3F suggested that aerial work operations include ride-sharing operations, and one individual commenter similarly suggested FAA extend the definition of aerial work to encompass the carrying of cargo for hire.

FAA has consistently interpreted the term "aerial work" to mean work done from the air with the same departure and destination points, while no property of another is carried on the aircraft, and only persons essential to the operation are carried on board the aircraft. Though there is a list of some aerial work operations in § 119.1(e)(4), this list is not exhaustive or comprehensive.[305] As proposed in the NPRM, certain aerial work operations for aircraft that meet the applicable consensus standard for that operation, based on the manufacturer's designation, will be permitted. Accordingly, to permit future

innovation, FAA declines to create a strict regulatory definition for aerial work and is instead providing a path for a risk-based assessment of current and future aerial tasks through the use of consensus standards.

Specifically in response to Doroni Aerospace's and 3F's comments regarding the carriage of persons or property for hire, as noted previously, FAA generally does not consider aerial work to include the carriage of passengers or property.[306] The carriage of property of another or persons not essential to the operation is outside the scope of aerial work and does not meet the exception in § 91.327(a)(3). Carriage of persons or property for compensation and hire is reserved, with some limited exceptions, for aircraft holding standard airworthiness certificates. This is because standard category aircraft are designed, manufactured, and produced with FAA oversight from inception through certification, to include showing compliance across a broad spectrum of regulatory and design standards, and thus, ensure the highest level of safety for the carriage of persons or property for hire. Therefore, FAA declines to expand the scope of aerial work allowed under § 91.327(a)(3) to include the carriage of non-essential persons or property for hire, and this rule will not allow light-sport category aircraft holding airworthiness certificates issued under § 21.190 to carry non-essential persons or property for compensation or hire.

Accordingly, FAA cautions that any operation that exceeds the bounds of FAA's aerial work interpretation (i.e., an operation that carries non-essential persons or property, or does not have the same departure and destination points) is not authorized by § 91.327(a)(3). In addition, any operation involving compensation or hire that is beyond the scope of what FAA considers to be aerial work would also not meet the exception in

§ 119.1(e)(4) and may require a commercial operator or air carrier certificate under part 119.

ii. Aerial Work Does Not Include Air Tours

Lockwood Aircraft Corp, LAMA, SkyRunner, and Fly Eagle Sport requested to broaden the interpretation of aerial work to include sightseeing, air tours, or both. These comments included recommendations on how aerial work air tours could be defined and their operational considerations (i.e., tours would be limited to unscheduled flights, made under VFR conditions, with commercial certificated pilots, tours beginning and terminating at the same location, and the aircraft used would conform to consensus standards with required inspections).

In response to these organizations' recommendations to include air tours in a broadened definition of aerial work, FAA notes that nonstop commercial air tours have historically been treated as a distinct category of operation from aerial work. A commercial air tour is defined in § 110.2 as a flight conducted for compensation or hire in an airplane, powered-lift, or rotorcraft where a purpose of the flight is sightseeing. This definition inherently includes the carriage of passengers who are not essential or necessary to perform the flight operation[307] and, therefore, FAA has previously interpreted air tours to be outside the scope of the aerial work exception.[308]

Moreover, nonstop commercial air tours and aerial work are separately itemized as exclusions from part 119 certification requirements in § 119.1(e)(2) and (e)(4), respectively. In accordance with the requirements of § 119.1(e)(2), nonstop commercial air tours are reserved for aircraft holding standard airworthiness certificates. As explained herein, the carriage of persons and property for hire is typically reserved for aircraft holding standard airworthiness certificates, to ensure the highest level of safety for

passengers. As such, commercial air tours must not be conducted with light-sport category aircraft. Thus, this final rule will not be combining these separate kinds of operations and does not authorize light-sport category aircraft to conduct commercial air tours using the exception in § 91.327(a)(3).

iii. Aerial Work for Weight-Shift-Control Aircraft and Powered Parachutes

USUA and two individual commenters recommended that weight-shift-control aircraft should also be allowed to conduct aerial work operations. They asserted these aircraft are uniquely suited for aerial work operations like low-altitude aerial survey and search and rescue missions. With regard to powered parachutes, one manufacturer and ten individuals commented that powered parachutes should be allowed to conduct aerial work operations for compensation and hire. Their opinion is that powered parachutes, in particular, are well suited for aerial work operations due to slow and stable platforms. Moreover, two commenters stated powered parachute airframes are designed and capable of enduring basic flight training, so they posited that those powered parachutes airframes can easily and safely perform aerial work operations too. The manufacturer further contended that FAA would provide preferential treatment if it allowed some light-sport category aircraft to conduct aerial work and excluded other aircraft like powered parachutes.

In response to the comments, FAA states that § 91.327(a)(3) does not specifically exclude any type of aircraft. Accordingly, any new light-sport category aircraft, including weight-shift-control aircraft and powered parachutes, certificated on or after [INSERT DATE 365 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER] may be eligible to conduct aerial work. The aircraft will have to meet the aerial work requirements of part 22 and the specific FAA-accepted consensus standards that act as a

means of compliance to those requirements. In addition, the aircraft manufacturer must provide the corresponding documentation requirements in § 21.190(c) and (d).

However, a pilot must still have appropriate pilot privileges to conduct aerial work for compensation or hire in these aircraft. The changes to § 91.327(a)(3) do not alter pilot certification requirements. For example, this rule does not amend § 61.315(c)(1) or (2), which prohibit the holder of a sport pilot certificate from carrying a passenger or property for compensation or hire and from operating for compensation or hire, respectively. A further explanation of the changes to pilot certificates and privileges under part 61 can be found in section IV.H, Sport Pilot Certification and Privileges, of this rule.

iv. Aerial Work for Gyroplanes

One flight school and a separate individual recommended that FAA allow commercial aerial work operations for gyroplanes. It is their opinion that gyroplanes are ideal for commercial applications, like aerial photography, news reporting, aerial tours, and search and rescue.

FAA notes that as proposed in the NPRM, and as adopted in this final rule, on or after [INSERT DATE 365 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER], any class of aircraft, including gyroplanes, is eligible for certification in the light-sport category, provided the aircraft meets the performance-based requirements of part 22 and the eligibility criteria in §§ 21.190 and 22.100.

Accordingly, gyroplanes that have been issued special airworthiness certificate in the light-sport category are able to conduct commercial aerial work operations as long as the requirements of § 91.327(a)(3) are met. Specifically, the aircraft will have to meet the aerial work requirements of part 22 and the specific FAA-accepted consensus standards

that act as a means of compliance to those requirements. And per § 91.327(a)(3), aerial work operations will need to be specified in the aircraft's pilot operating handbook or operating limitations, as applicable, and specified in the manufacturer's statement of compliance for the aircraft, in accordance with § 21.190.

b. Towing a Glider or Unpowered Ultralight Vehicle

This final rule maintains the current exception in § 91.327(a)(1) allowing for compensation or hire operations in a light-sport category aircraft to tow a glider or an unpowered ultralight vehicle in accordance with § 91.309. As explained previously, this final rule also adopts a new exception, § 91.327(a)(3), which will allow some light-sport category aircraft to conduct certain aerial work operations.

The SSF noted positive support for the broad goals of this NPRM. However, SSF expressed concern that the addition of the aerial work exception in § 91.327(a)(3) may cause confusion regarding glider towing operation because the proposed revisions to § 91.327(a) did not remove or add clarifying text to § 91.327(a)(1). The SSF stated if FAA views glider towing as separate from aerial work, this should be clarified. In addition, the SSF noted the proposed amendments to aircraft certification rules in §§ 21.190(c)(2)(iii), 21.190(e), 21.190(e)(6), 22.120, and 22.195(d) require a manufacturer to identify the kinds of aerial work operations that may be conducted using the aircraft but do not include a similar requirement for glider towing operations. The commenter further stated § 91.327(a)(3) requires manufacturers to document the types of approved aerial work operations in the POH but that there is not a similar requirement in § 91.327(a)(1) for glider towing operations.

In response to SSF’s comment, FAA is clarifying that the towing of gliders and unpowered ultralight vehicles is not considered aerial work for purposes of

§ 91.327(a)(3). Since 2004, § 91.327(a)(1) has allowed light-sport category aircraft to tow a glider or an unpowered ultralight vehicle for compensation or hire in accordance with § 91.309. FAA recognizes glider or unpowered ultralight vehicle towing as a specialized operation with its own specific regulations, such as §§ 91.309 and 61.69. These specific regulations require additional safety mitigations (e.g., aircraft equipage, pilot experience and training requirements, towline specifications, and ATC or FAA flight service station coordination), which may not be applicable to typical aerial work operations. Accordingly, this final rule is not intended to change the preexisting exception in § 91.327(a)(1), and, with the revisions to § 91.309(a)(2) adopted by this final rule, FAA is reiterating its intention that all towing of gliders and unpowered ultralight vehicles by aircraft holding a special airworthiness certificate in the light-sport category be accomplished in accordance with the requirements of § 91.309.

With respect to SSF's comment regarding whether glider towing operations conducted under the exception in § 91.327(a)(1) must be specified in the POH, it has always been the position of FAA, since the exception was created by the 2004 final rule, that an aircraft must meet any applicable consensus standards for glider or unpowered ultralight vehicle towing and must be operated in accordance with any towing procedures and limitations outlined in the POH. For example, the annex in ASTM Standard F2245, which is applicable to light-sport category aircraft, includes FAA-accepted consensus standards for the design and performance of airplanes that are used to tow gliders, and this standard specifies that aircraft manufacturers must include operating limitations applicable to towing operations in the POH. Accordingly, the POH for a light-sport category aircraft equipped for towing should already meet the requirements of ASTM

Standard F2245, Annex A1.7, and, in turn, any light-sport category aircraft certified to that standard would be required to operate in accordance with those requirements.

This final rule, as explained previously in section IV.E.2, adds an explicit requirement in § 21.190(c)(2)(iv) that the POH include any instructions or limitations necessary to safely conduct towing operations. This rule also adds a requirement in § 21.190(d)(3)[309] that the manufacturer's statement of compliance specify any towing operations the manufacturer has determined may be safely conducted. Therefore, in the interest of clarity, and in alignment with these certification standards in this rule, FAA agrees with SSF's suggestion to add language to § 91.327(a)(1) clarifying that, similar to aerial work operations, towing operations conducted under this exception must be specified in the aircraft's pilot operating handbook or operating limitations, as applicable, and specified in the manufacturer's statement of compliance for the aircraft. And, with respect to the SSF's reference to aircraft certification requirements in § 21.190 and part 22, further discussion of these requirements may be found in sections IV.E.2, IV.E.5.c, IV.F.14, and IV.F.30 of this rule.

c. Maximum Occupants in Light-Sport Category Aircraft Operations

This final rule adopts § 91.327(f)(1) and (2) as proposed in the NPRM. FAA anticipates the expansion of aerial work in this rule, along with the other amendments applicable to light-sport category aircraft, may lead to an increased interest in light-sport category aircraft operations that carry a higher number of occupants. The addition of § 91.327(f)(1) and (2) addresses these concerns. The new regulations state that no person may operate an airplane certificated as a light-sport category aircraft when carrying more than four occupants, including the pilot. For light-sport category aircraft other than

airplanes, the new language also states that no person may operate such aircraft when carrying more than two occupants, including the pilot.

USUA commented favorably about the expansion of airplane seating to four occupants but requested FAA similarly increase the maximum occupancy for other types of light-sport category aircraft. Specifically, USUA proposed amending § 91.327(f)(2) to authorize operation with more than two occupants. Another commenter, similarly, wanted light-sport category airships (lighter-than-air) aircraft to allow for up to ten occupants. Lastly, a self-identified flight instructor opined that three-seated weight-shift-control trikes are as safe as the two-seated trikes as long as the additional occupants are seated in a position that maintains a balanced center of gravity. As such, the flight instructor recommended that private pilots flying weight-shift-controlled trikes should be able to operate with three occupants on board, and suggested FAA revise the proposed regulatory language under § 91.327(f)(2) to allow for a person to operate a weight-shift-control aircraft certificated in the light-sport category with three occupants. In addition to this recommendation, the flight instructor agreed that sport pilots flying weight-shift-controlled trikes should be allowed to carry only one occupant.

FAA appreciates these commenters' suggestions for a revision to the proposed language § 91.327(f)(2) to allow for a person to operate aircraft other than airplanes certificated in the light-sport category with additional occupants, beyond the two occupants proposed by the rule. Section IV.F.4 of this rule discusses FAA's rationale for retaining a two-seat limit for eligibility for a special airworthiness certificate in the light-sport category for aircraft other than airplanes. These reasons also support not expanding the number of persons on board a light-sport category aircraft other than an airplane.

Accordingly, as explained previously in section IV.F.4, this final rule retains in the certification requirements in § 22.100 the maximum seating capacity of not more than two persons, including the pilot, for all classes of light-sport category aircraft other than airplanes. Therefore, to be eligible for a special airworthiness certificate in the light-sport category issued under § 21.190, an aircraft other than an airplane can only have seating capacity for two occupants, including the pilot. As a result, any aircraft other than an airplane holding a special airworthiness certificate in the light-sport category is limited to two seats. In alignment with the certification requirements, this rule will retain the maximum occupancy limit in § 91.327(f) of no more than two persons for classes of light-sport category aircraft other than airplanes, which includes gyroplanes, gliders, weight-shift-control aircraft, powered parachutes, balloons, airships, and new types of light-sport category aircraft such as rotorcraft and powered-lift.

FAA may consider future rulemaking to increase the two-occupant limitation for classes of aircraft other than airplanes as FAA's experience with these aircraft increases and consensus standards are developed.

FAA also notes that the addition of § 91.327(f)(1) does not change the restriction in part 61 for pilots holding a sport pilot certificate, which does not allow such pilots to carry more than two persons, including the pilot. Pilots holding valid higher grade of certification, such as a private, commercial, or ATP certificate, may operate light-sport category aircraft with the higher number of occupants allowed under the new § 91.327(f)(1). Moreover, even with the addition of § 91.327(f)(1), persons carrying passengers in operations for compensation or hire that do not qualify for an exception in § 119.1(e) must hold an appropriate air carrier or commercial operating certificate as required by part 119.

2. Operating Limitations for Experimental Aircraft

In the NPRM, FAA proposed to amend § 91.319(c) to allow the Administrator to issue operating limitations to certain aircraft with experimental airworthiness certificates to conduct operations over densely populated areas, in congested airways, or both, for all phases of flight, which includes, but is not limited to, takeoffs and landings. This final rule adopts the amendments to § 91.319(c) as proposed in the NPRM, with a few minor administrative changes. Section 91.319(c) expands the types of operations authorized over densely populated areas or in congested airways for certain aircraft with experimental airworthiness certificates by allowing the Administrator to issue operating limitations that allow such operations for all flight segments. The general prohibition against experimental aircraft operating over densely populated areas or in congested airways continues to apply to all experimental aircraft that do not hold appropriate operating limitations issued by the Administrator.

a. Section 91.319(c) Regulatory Language

FAA received a few comments on the proposed regulatory language for § 91.319(c). One commenter suggested that FAA provide an official definition of congested airway because they assert the term is vague and is applied in an inconsistent manner by local FSDO inspectors, which causes confusion for pilots about where they can fly. Piper, along with another commenter, requested FAA amend the language of § 91.319(c) to replace "takeoffs and landings" with "approaches and departures," since many aircraft operations occur within the vicinity of an airport without an actual landing. Piper stated this language change would allow for multiple approaches and certain flight-testing operations that do not require a physical landing and therefore may not be compliant with the "takeoffs and landings" requirement in § 91.319(c). Another

commenter proposed new regulatory language that would prohibit prolonged operation over densely populated areas and allow pattern work[310] as an exception to § 91.319(c). Lastly, one individual requested that FAA remove paragraph (c) from § 91.319 entirely, asserting that most pilots of experimental aircraft are in violation of this regulation as many airports are surrounded by densely populated areas.

In response, FAA declines to define the terms "densely populated areas" or "congested airways" in this final rule. FAA historically applies these terms on a case-by-case basis,[311] which allows for flexibility in its administration of balancing the interests of the pilot's operation and protecting persons and property on the ground. In response to Piper's request, FAA notes the NPRM proposed removing in entirety the "takeoffs and landing" limitation from the regulatory text. While the previous § 91.319(c) only authorized the Administrator to issue special operating limitations to conduct takeoffs and landings, the proposed new § 91.319(c) allows the Administrator to issue operating limitations for all flight segments, which is broad enough to include approaches and departures. Accordingly, it is not necessary to amend the language of § 91.319(c) to include approaches and departures, because the new regulatory language already authorizes the Administrator to issue operating limitations for all phases of flight, which includes allowing approaches and departures to be conducted over densely populated areas and in congested airways.

FAA declines to remove paragraph (c) from § 91.319 as one commenter requested, as their assertion that most pilots of experimental aircraft are in violation of this regulation due to densely populated areas surrounding many airports is inaccurate. Notwithstanding the general prohibition against experimental aircraft operating over densely populated areas or in congested airways, FAA does not agree with this

commenter's assertion that these operations are in violation of § 91.319(c) when the Administrator has issued operating limitations authorizing takeoffs and landings. While this final rule authorizes the issuance of operating limitations that include additional phases of flight, FAA intends to retain the general prohibition on operations over densely populated areas or in congested airways for aircraft that do not hold appropriate operating limitations.

With respect to the commenter's proposal for new regulatory language to prohibit prolonged operation over densely populated areas and allow pattern work as an exception, FAA does not agree with changing the proposed regulatory text to codify these exceptions. Some of these operations may be authorized by operating limitations in accordance with the policy and procedures that will be outlined in a future update to FAA Order 8130.2, which the Agency will issue in draft form for public comment. FAA intends to retain the general prohibition on operations over densely populated areas and in congested airways for all experimental aircraft that do not hold appropriate operating limitations allowing such operations. Moreover, "pattern work" is not a recognized phase of flight and is not clearly defined within or by regulation; therefore, its inclusion in this regulation may create more ambiguity.

As discussed herein, FAA is adopting as final the language proposed in the NPRM, with two minor changes. First, in the NPRM, FAA inadvertently removed the phrase "congested airway" from the proposed text of § 91.319(c). FAA did not intend to remove the general prohibition on operations in congested airways, as evidenced by the repeated discussion of "congested airways" in the preamble of the NPRM. In this final rule, FAA is retaining the phrase "over a densely populated area or in a congested airway," in § 91.319(c), as it read previously. Second, FAA has added the word

"airworthiness" after "experimental" in the title of the section and throughout § 91.319 to conform and align the language in this section with the rest of this final rule. Adding the word "airworthiness" is not intended to change the meaning or intent of these paragraphs. Other than these two minor changes, FAA is not making any other modifications to the regulatory text proposed in the NPRM.

b. Policy Related to the Issuance of Operating Limitations

FAA received several comments on this proposal from industry associations such as EAA, AOPA, NATA, NBAA, GAMA, and the Manufacturers Flight Test Council; from industry manufacturers such as Hartzell Propeller, Bombardier, and Textron; from Contract Air Support providers Tactical Air Support, Inc. and Top Aces Corp; as well as from individual commenters. The commenters were generally supportive of the proposal to amend the language in § 91.319(c) and many requested to collaborate with FAA in developing and expanding the policies related to the issuance of such operating limitations. Most of these comments focused on FAA's internal policies and procedures governing the issuance of operating limitations.

Specifically, some commenters expressed concern that FAA may abandon well-accepted, risk-based certification processes for experimental aircraft. Some commenters voiced concern and varying opposition to the NPRM preamble language that detailed FAA's proposed policy to administer this change. In particular, the industry associations objected to the policy proposed in the NPRM that plans-built aircraft or other experimental aircraft be excluded from this operating privilege. Commenters noted FAA Order 8130.2 currently allows FAA to issue operating limitations for these types of aircraft for certain flights over densely populated areas, following risk mitigation through Phase I flight testing. An individual commenter added that if amateur and kit-built

aircraft have been issued a special airworthiness certificate and deemed safe for flight, then restrictions on issuing operating limitations should be removed regardless of whether the aircraft is kit or plans-built.

One individual opposed the NPRM's proposed policy statement that experimental aircraft having a single point of failure should not be eligible for the proposed operating limitations over densely populated areas or in congested airways. They asserted that because some legacy aircraft that already hold such operating limitations can have single points of failure, such a restriction would inconstantly apply risk mitigation.

Textron expressed concerns that the NPRM indicated FAA may further restrict operations of aircraft with ejection seats or detachable external stores to operate over densely populated areas. Textron stated existing prohibitions on external stores are effective and prevent inadvertent detachment while operating in the national airspace system. Textron expressed concern that further restriction would severely hamper new product development with no safety benefit. Textron further stated it is a false assumption to equate ejection seats with increased risk since the probability of a modern defense aircraft suffering a catastrophic failure is equivalent to any other aircraft in that category or class. It asserted that ejection seats are not installed to counteract an unsafe aircraft characteristic. Top Aces Corp, in contrast to Textron's specific concerns for restricted operations for aircraft with ejection seats or detachable external stores, generally requested that all former military aircraft holding experimental airworthiness certificates operating repositioning flights be eligible for operating limitations over densely populated areas.

In response, FAA agrees with the commenters' assertions that the preamble is not the appropriate venue for discussion about policy and relative risk, and about which

classes, designs, or specific experimental aircraft may or may not be eligible for this operating limitation. Accordingly, and in response to Top Aces Corp's request, FAA will not be publishing exclusionary criteria for any aircraft in this final rule and this preamble does not reference any class, group, or category of aircraft that may be excluded from obtaining certain operating limitations. With respect to commenters' concerns that FAA may be changing or further restricting aircraft equipped with external stores, it is not the intent of FAA to codify any new restrictions on external stores in § 91.319 of this final rule.

As explained in the NPRM, FAA will continue to use a risk-based approach when evaluating a given operator's eligibility for an operating limitation allowing operation over a densely populated area or in a congested airway. FAA will utilize follow-on policymaking documents, such as FAA Order 8130.2, to publish policy related to the issuance of operating limitations that allow flight over densely populated areas, in congested airways, or both. FAA intends to publish for public comment a draft policy governing the issuance of operating limitations and a non-exhaustive list of factors FAA intends to consider for eligibility, following the publication of this final rule. FAA will consider the associations', manufacturers', and other commenters' concerns and recommendations discussed above as FAA Order 8130.2 is revised and new procedures relating to operating limitations are developed. The publication process will also allow other interested parties to provide additional feedback on FAA's policy governing the issuance of operating limitations. Following the receipt of public comments, FAA expects a revised FAA Order 8130.2 incorporating these changes to be published prior to the effective date of this final rule.

c. Conforming Amendments to § 91.319

This final rule makes conforming amendments to § 91.319 to standardize the language used in this section with the rest of the rule. In paragraphs (a) through (g) and paragraph (j), the term "experimental certificate" is replaced with the term "experimental airworthiness certificate."

Additional changes were made to § 91.319(e) and (f) to align these paragraphs with the changes made to §§ 1.1 and 21.191(i). Specifically, as explained subsequently in section IV.L.1.a of this rule, effective [INSERT DATE 90 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER], the airworthiness certification of light-sport category kit aircraft, which previously occurred under § 21.191(i)(2), will occur under the § 21.191(k); and the airworthiness certification of former light-sport category aircraft, currently under § 21.191(i)(3), will occur under the new § 21.191(l). In addition, effective [INSERT DATE 365 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER], the definition of "light-sport aircraft" will be removed from § 1.1.

Accordingly, FAA has removed the term "light-sport aircraft" from the introductory language in paragraphs (e) and (f) of § 91.319 and from subparagraph (e)(2), effective [INSERT DATE 365 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]. In tandem with the removal of this term, FAA is adding a reference to "§ 21.191(i), (k), or (l)" in each of these paragraphs to clarify the aircraft to which these paragraphs are applicable. Sections 21.191(i), (k), and (l), as adopted by this final rule, include the same aircraft as the previous § 21.191(i)(1), (2), and (3). Therefore, these conforming amendments are intended to align and standardize the language used throughout this rule and are not intended to change the applicability or meaning of these paragraphs.

3. Operating Limitations for Restricted Category Aircraft

This final rule responds to the evolving needs of restricted category civil aircraft and provides for future growth and innovation without compromising safety by codifying in part 21 previously approved special purposes for restricted category aircraft operations.[312] The NPRM did not propose any corresponding changes to the operational rules for restricted category aircraft in § 91.313. However, as discussed previously in section IV.K.2, the NPRM did propose, and this final rule adopted, changes regarding the issuance of operating limitations for aircraft with experimental airworthiness certificates in § 91.319(c), that allow the Administrator to authorize flight over densely populated areas or in congested areas for all phases of flight and flight segments.

This amendment to § 91.319(c) without a corresponding change to § 91.313(e) may have inadvertently placed restricted category aircraft below experimental aircraft on the safety continuum, which is out of alignment with the way in which these categories of aircraft are typically regulated.[313] To apply a uniform safety continuum throughout the aviation industry, FAA recognizes that acceptable level of risk varies between sectors and implements regulations accordingly. Accordingly, to properly realign restricted category civil aircraft with experimental aircraft within the safety continuum, FAA is clarifying § 91.313(e) to ensure the Administrator is authorized to issue operating limitations to restricted category aircraft using the same risk-based approach as is used to issue operating limitations to experimental aircraft.

Specifically, FAA is amending § 91.313(e) by removing the word "special," which preceded "operating limitations," in order to align this paragraph with the language used for experimental aircraft in § 91.319(c). The word "special" in § 91.313(e) may have inadvertently precluded the issuance of operating limitations; and consequently,

operating limitations were rarely issued to restricted category aircraft in practice. The removal of the term "special" is intended to eliminate any ambiguity surrounding the Administrator's ability to issue such operating limitations to restricted category aircraft.

It is FAA's intention that, with this clarification, certain restricted category aircraft may be issued operating limitations authorizing flight over densely populated areas, in congested airways, or near a busy airport using a similar risk-based approach as is used for experimental aircraft. In addition, § 91.313(e) retains the authority of the Administrator to issue an operator a certificate of waiver.

As with the issuance of these operating limitations to experimental aircraft, FAA will use a risk-based approach when evaluating a given operator's eligibility for an operating limitation to certain aircraft holding restricted airworthiness certificates. As explained previously with respect to the issuance of operating limitations for aircraft holding experimental airworthiness certificates, following the publication of this final rule, FAA will be publishing for public comment a draft policy relating to the issuance of operating limitations and a non-exhaustive list of factors FAA considers when considering a given aircraft's eligibility. This process will allow interested parties to provide additional feedback on FAA's policy applicable to the issuance of operating limitations, and those comments provided will be considered in the development of an updated FAA Order 8130.2. FAA expects the revised FAA Order 8130.2 to be published prior to [INSERT DATE 365 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER], the effective date of this final rule applicable to § 91.313.

In addition, this final rule makes a minor amendment to § 91.313(b)(3) to allow restricted category aircraft to be relocated for exhibition. Currently under § 91.313(a), a restricted category aircraft cannot be operated for other than the special purpose for

which it is certificated, or other than an operation necessary to accomplish the work activity directly associated with that special purpose. This final rule retains and does not amend this restriction. Instead, this minor amendment adds "exhibition" to the list in § 91.313(b)(3) of operations that are considered necessary to accomplish the work activity directly associated with a special purpose operation. This change allows restricted category aircraft to fly to exhibitions, trade shows, and other events. FAA cautions, however, that while at the exhibition event, operation of the aircraft is still limited to the "special purpose for which [the aircraft] is certificated," in accordance with § 91.313(a)(2). Therefore, depending on the aircraft's special purpose, an aircraft may be limited to static display at such events.

This amendment is intended to realign restricted category civil aircraft within the safety continuum. Both restricted category aircraft and aircraft holding experimental airworthiness certificates are limited in operations to the special purposes for which the aircraft is certificated, with limited exceptions. However, experimental airworthiness certificates can be issued for multiple special purposes, including for the purpose of exhibition, whereas restricted category aircraft cannot. There is no special purpose operation for which restricted category aircraft may be certificated that allows operation for exhibition. This places these aircraft out of alignment on the safety continuum.

Accordingly, the minor amendments made to § 91.313(b) and (e) are intended to ensure certain restricted category aircraft, which hold a higher-grade airworthiness certificate than an experimental aircraft, have similar privileges as that of certain experimental aircraft.

Though this amendment would allow restricted category aircraft to operate for the purpose of relocating to a trade show or other kind of exhibition, a restricted category

aircraft will still need to be issued appropriate operating limitations or a certificate of waiver to operate such a relocation flight over a densely populated area, in a congested airway, or near a busy airport, in accordance with § 91.313(c).

4. Operating Limitations for Experimental Aircraft Operating Space Support Vehicle Flights

FAA received three comments regarding the new § 91.331 proposed in the NPRM, which codifies section 581 of FAA Reauthorization Act of 2018 (the Act) and 49 U.S.C. 44740. The Act and corresponding statute authorized certain operators of aircraft with special airworthiness certification in the experimental category to conduct space support vehicle flights to simulate space flight conditions carrying persons or property for compensation or hire.

First, ALPA suggested FAA codify its space support vehicle regulations in title 14, chapter III, which governs Commercial Space Transportation, rather than in title 14, chapter I, as proposed in the NPRM. ALPA claimed that consolidating the space support vehicle and space support vehicle flight regulations into title 14, chapter III will ensure that all commercial space research, development, and operations approvals are contained in one dedicated set of regulations for commercial space.

While FAA appreciates ALPA's goal of consolidation, FAA has determined the proposed regulations related to space support vehicles are appropriately located in part 21 and 91, which are in title 14, chapter I. ALPA's proposed location, title 14, chapter III, "Commercial Space Transportation," explicitly applies to the procedures and requirements applicable to activities conducted under 51 U.S.C. subtitle V, chapter 509. When an aircraft is operating as a space support vehicle for the purpose of simulating space flight conditions, and not for the purpose of a launch, title 51 is not applicable.

Instead, the operation and the aircraft are governed by title 49. Therefore, the regulations proposed in the NPRM to implement the Act, and associated 49 U.S.C. 44740, are appropriately located in title 14, chapter I, which applies generally to all aircraft regulated by FAA operating under title 49.

Second, ALPA recommended that FAA develop guidance materials to clarify and expand on the terms and use of space support vehicles. ALPA recommended the guidance provide the public with a better understanding of the dividing line between space support vehicle operations and commercial space launch operations to ensure that there is no operational safety gap between the two types of operations. In response, FAA agrees that guidance materials will be helpful for both the operator and the agency in determining how to implement and apply the new § 91.331. As with the other provisions of this final rule that address operating limitations, FAA anticipates publishing for public comment a draft policy governing the issuance of operating limitations for space support vehicles. FAA will consider the comments submitted in response to the NPRM, as well as any new comments submitted in response to the publication of the draft policy, in formulating its revision to FAA Order 8310.2. FAA anticipates a revised FAA Order 8130.2 incorporating this guidance will be finalized and published prior to the effective date of the new § 91.331.

Virgin Galactic also provided similar comments on FAA's proposal in the NPRM. Virgin Galactic supported FAA's proposed regulatory language in § 91.331 because it did not deviate from the straightforward Congressional statutory mandates. However, Virgin Galactic took issue with FAA's suggested policies for implementing the new regulation. Specifically, Virgin Galactic read the NPRM to be proposing a "single use" approval process that would require FAA to review and approve every proposed space

support vehicle flight prior to its occurrence, which it viewed as cumbersome. Virgin also raised concerns with the NPRM's proposed fact-intensive policy for reviewing and approving requests for operating limitations and questioned FAA's methodology for and ability to review whether a particular research and development task for a proposed flight requires the unique capabilities of the aircraft and whether a person qualifies as a potential space flight participant, government astronaut, or crew.

FAA did not intend to give the impression in the NPRM that every proposed space support vehicle flight would require individual approval. As is current practice, FAA will continue to issue experimental airworthiness certificates for eligible space support vehicles subject to the durations of § 21.181. As described in section IV.G.3, this final rule increases the duration of an experimental airworthiness certificate issued for research and development, showing compliance with regulations, crew training, or market survey. Such certificates will remain effective for three years from the date of issue or renewal unless FAA prescribes a shorter period. Accordingly, repeated space support vehicle flights are permitted under an experimental airworthiness certificate as long as the experimental airworthiness certificate remains in effect and the operation meets the requirements of § 91.331 and any applicable operating limitations.

Regarding Virgin's concern about FAA's proposed policies for implementing § 91.331, FAA is taking Virgin's comments under consideration, and as stated previously, FAA will be publishing for public review and comment proposed policies and guidance for the issuance of operating limitations in FAA Order 8130.2 prior to the effective date of the new § 91.331. FAA has determined that this final rule is not the appropriate place to finalize policies or guidance for the issuance of operating limitations relating to space support vehicles.

The intent of this final rule is simply to codify statutory language and ensure that FAA's regulations harmonize and do not conflict with 49 U.S.C. 44740. Regarding the definitions in § 1.1, NPRM proposed adding two new definitions for "space support vehicle" and "space support vehicle flight." The definitions are consistent with the way these terms are used and defined in 49 U.S.C. 44740 and 51 U.S.C. 50902. The only comment received regarding the definitions noted the definitions were identical to those used in the statutes. Therefore, FAA is adopting these definitions as proposed.

FAA did not receive any comments about the regulatory text of § 91.331. Therefore, FAA is adopting § 91.331 as proposed, with one minor clarifying amendment. The NPRM proposed § 91.331(a)(1) to read: "The aircraft has a special airworthiness certificate issued under § 21.191 of this chapter to operate the aircraft for the purpose of conducting a space support vehicle flight." FAA has determined that the use of the word "purpose" here may be confusing because this final rule explicitly does not create a new experimental purpose under § 21.191 for space support vehicle flights. A plain reading of the proposed § 91.331(a)(1) may give the impression that an operator must obtain a certificate under § 21.191 for the "purpose of conducting a space support vehicle flight," which does not exist. Instead, as stated in the NPRM, space support vehicles would conduct space support vehicle flights under an existing § 21.191 experimental purpose, such as research and development or crew training. Therefore, FAA is removing this superfluous language, and § 91.331(a)(1) will now read: "The aircraft has a special airworthiness certificate issued under § 21.191 of this chapter." This minor amendment does not change the application, intent, or meaning of the regulation, as paragraph (a) already limits the applicability of § 91.331 to persons operating an aircraft "to conduct a space support vehicle flight."

Lastly, IAR commented that it is currently authorized to conduct space vehicle launch support operations with its restricted category special airworthiness certificate, and requested FAA refrain from making any regulatory changes or taking other actions that may limit restricted category operators' ability to conduct space vehicle launch support operations. In response, FAA states that the changes to §§ 91.331 and 91.319 regarding space support vehicle flights are solely intended to implement section 581 of the Act and, therefore, only apply to aircraft with special airworthiness certification in the experimental category. This final rule is not intended to impact the ability of any restricted category aircraft to continue to conduct authorized space vehicle launch support operations.

5. Right-of-Way Rules

The NPRM proposed amendments to § 91.113(d)(2) and (3) to expand the categories of aircraft listed in the right-of-way rules. Specifically, the proposed amendments replaced an enumerated listing of aircraft categories with the broader term "powered aircraft" and replaced the term "engine-driven" with the term "powered aircraft" to better convey the inclusion of aircraft that may have non-traditional forms of propulsion, including electric propulsion.

As further explained, this final rule adopts the changes as proposed in the NPRM, with one minor clarification in paragraph (d)(3) regarding airships. FAA also notes that after the publication of the NPRM, FAA published the final rule for the Integration of Powered-lift: Pilot Certification and Operations (hereinafter "Powered-Lift Rule"), which added a new paragraph (d)(4) to § 91.113. To align paragraph (d)(4) with the rest of the changes made by this final rule, FAA has also replaced the term "engine-driven" with "powered aircraft" in this paragraph.

ALPA was generally supportive of the proposed changes to § 91.113 but raised a concern about powered-lift. Specifically, ALPA asserted that the proposed language explicitly treats powered-lift operating in wing-borne flight mode as fixed-wing aircraft; however, powered-lift operating in vertical-lift flight mode are not equivalent to fixed-wing aircraft, and therefore, should not be treated the same under the proposed regulation.

In response to ALPA's concern, FAA notes that after the publication of the MOSAIC NPRM, FAA published the final Powered-Lift Rule.[314] This rule amended § 91.113(d)(2) and (3) by adding "powered-lift" to the types of enumerated aircraft in the regulation. When proposing these changes in the NPRM, the Powered-Lift Rule explicitly proposed that powered-lift, airplanes, and rotorcraft should be grouped in the same right-of-way category and did not distinguish between whether the powered-lift was operating in vertical or wing-borne flight mode. As stated in the Powered-Lift Rule NPRM, if a powered-lift is converging with an airplane, the aircraft to the right would have the right-of-way, regardless of the flight mode in which the powered-lift is operating. Furthermore, the Powered-Lift Rule acknowledged that the MOSAIC rule would subsequently amend § 91.113, and thus the changes were intended to be superseded by the publication of this final rule. Accordingly, the amendments adopted in this final rule are consistent with the Powered-Lift Rule, in that a powered-lift is treated as a "powered aircraft" regardless of the flight mode in which it is operating.

One commenter expressed confusion about the proposed language in § 91.113(d)(3), stating that it was not clear which aircraft has the right-of-way when an airship meets an aircraft towing or refueling other aircraft because under the regulation both have the right-of-way over all other powered aircraft. To address this commenter's

concern, FAA has amended the proposed language to clarify that an aircraft towing or refueling always has the right-of-way over all other powered aircraft.

Section 91.113(d)(3) will now expressly state that an airship has the right-of-way over all other powered aircraft, except for an aircraft towing or refueling other aircraft; and an aircraft towing or refueling other aircraft has the right-of-way over all other powered aircraft.

FAA also received several comments regarding UAS operations. AURA Network Systems, Inc. (AURA), DroneUp LLC (DroneUp), AUVSI, CDA, and Reliable Robotics Corporation's comments were generally supportive of the NPRM's proposed amendments to § 91.113(d)(2) and (3), but they requested amendments to § 91.113(b) as well. AURA specifically expressed that the NPRM was a logical update to address the ever-expanding complexity of aircraft operating in the NAS, including right-of-way rules. However, AURA suggested that FAA needs to address the concern that UAS operations are not able to comply with the general provision in § 91.113(b) as currently written. AURA posited that the use of the word "see" in this section requires a pilot to use unaided vision to see other aircraft in the vicinity. AURA and CDA submitted that revising § 91.113(b) to include "detect" in addition to seeing and avoiding other aircraft may reduce the UAS industry's regulatory burden by eliminating the need for a certificate of waiver or authorization with respect to right-of-way rules for UAS flights not subject to part 107 and possibly reduce FAA's administrative burden of processing certificate of wavier or authorization requests. Reliable Robotics Corporation similarly recommended the addition of "or detect using a means approved by the Administrator" to § 91.113(b) and AUVSI added that including the term "detect" in § 91.113(b) is consistent with collision avoidance language in ICAO's UAS publication in 2011.[315]

Generally, each of these commenters wanted pilots to see or detect and avoid other aircraft. They posited that advancements in Detect and Avoid (DAA) technology allows light-sport category aircraft pilots the ability to detect and track all aircraft traffic without human vision, even those without a transponder. Moreover, the commenters maintained that DAA technology and the requested amended language to § 91.113(b) have the potential to improve safety by reducing midair collisions with unmanned aircraft as well as manned aircraft.

In response, FAA declines to amend § 91.113(b) as requested by these commenters. FAA deems this request beyond the scope of the MOSAIC rulemaking because FAA did not propose any amendments to § 91.113(b) in the NPRM. Though FAA shares the commenters' mission for improving safety within the NAS by reducing midair collisions with unmanned and manned aircraft, DAA technology is not addressed within this final rule. DAA technology will not be included in this rulemaking for many reasons, which include, but not limited to: (1) additional rulemaking approval and a separate public comment period; (2) additional costs on operators created by equipage issues; (3) additional training and pilot certification requirements; and (4) additional development of a performance standard for its incorporation, each of which are well beyond the scope of the changes proposed by the NPRM. However, the recommendations of AURA, DroneUp, AUVSI, CDA, and Reliable Robotics Corporation may be considered for future rulemaking.

6. Operations at Airports in Class G Airspace

This final rule makes two changes to § 91.126(b) that differ from what was proposed in the NPRM. First, with respect to (b)(1), FAA removed the phrase "and powered-lift aircraft operating in wing-borne flight mode." In the period between the

publication of the NPRM and this final rule, FAA published the Powered-Lift Rule. Section 194.302(e) and (f) of the Powered-Lift Rule applied § 91.126(b)(1) to powered-lift operating in wing-borne flight mode and applied and (b)(2) to powered-lift operating in vertical-lift flight mode. Accordingly, the proposed language in § 91.126(b)(1) regarding powered-lift is redundant, as powered-lift operating in wing-borne flight mode are already required to comply with (b)(1). Therefore, FAA removed the language in § 91.126(b)(1) specific to powered-lift.

Secondly, with respect to § 91.126(b)(2), FAA received one comment noting that the proposed language was confusing in its applicability to non-powered gliders and gyroplanes, because it required non-powered gliders as well as gyroplanes to avoid the powered fixed-winged traffic pattern, which is a departure from the current practice. Another comment similarly noted the proposed regulation was silent on non-powered gliders, which are currently allowed to fly within the same traffic pattern as powered aircraft if circumstances permit. The commenter also stated this regulation conflicts with the right-of-way rules in § 91.113(d)(2), because it implies that non-powered gliders must give way to powered, fixed-wing aircraft even though, under § 91.113(d)(2), a glider has the right of way over powered aircraft. Accordingly, the commenter noted the change, as worded, is ambiguous and is counter to current safe practices, producing unexpected traffic conflicts.

FAA agrees with the commenters that the proposed text was ambiguous with respect to non-powered aircraft. The final rule clarifies paragraph (b)(2) in this final rule by adding the word "powered" before "aircraft," such that (b)(2) now applies to "any other powered aircraft." This minor language addition remedies the commenter's concerns regarding non-powered gliders. Consistent with the guidance in AC-90-66C,

Non-Towered Flight Operations, if both airplanes and gliders use the same runway, the glider traffic pattern should be inside the pattern of powered aircraft. Gliders may fly the same direction traffic pattern as powered aircraft in certain wind conditions and may use a separate, opposing direction traffic pattern in other wind conditions.

With respect to one commenter's statement that proposed § 91.126(b)(2) conflicted with § 91.113, FAA disagrees. It has always been FAA's position that the right-of-way rules in § 91.113 are still in effect throughout the traffic pattern and when landing, even at uncontrolled airports in Class G airspace. This means that all pilots operating at a non-towered airport have the general responsibility to see and avoid under § 91.113(b) and that, per § 91.113(d), when two or more aircraft are approaching an airport for the purpose of landing, the aircraft at the lower altitude has the right-of-way. Specifically, the right-of-way rules in § 91.113(d) apply when aircraft are converging. Therefore, it was not FAA's intention with the proposed changes to § 91.126(b)(2) to suggest that non-powered aircraft, including gliders, must give way to powered aircraft in all circumstances. The revised language adopted in this final rule is intended to remedy that confusion.

7. Section 91.309

In the NPRM, FAA proposed to amend § 91.309(a)(2) to correct an oversight in the allowable process to attach a tow hook to eligible light-sport category aircraft.[316] FAA received several comments on the proposed amendment. The Soaring Society of Boulder requested FAA treat light-sport category aircraft equal to standard airworthiness certificated aircraft with respect to towing of gliders and permit installation of a glider tow-hitch in the same manner as standard certificated aircraft. Fly Eagle Sport commented specifically with respect to light-sport category aircraft and stated FAA

should clarify in the rule that a tow-hitch approved by the manufacturer can be used. Seven individual commenters asked that § 91.309 allow for light-sport category aircraft towing privileges equivalent to standard category aircraft. Several commenters also suggested that the rule needs to remove "Administrator Approval" requirements for tow hooks for light-sport category aircraft and allow alternate methods of attachment.

As explained in the NPRM, § 91.309(a)(2) is amended to remedy an oversight in the 2004 final rule, which required a towing aircraft to be equipped with a tow-hitch "approved by the Administrator" and installed in a manner "approved by the Administrator." This language was unworkable for light-sport category aircraft and inadvertently precluded such aircraft from towing gliders and unpowered ultralight vehicles, because, in practice, FAA does not routinely approve a tow-hitch or tow-hitch installation on a light sport-category aircraft, since the aircraft itself is not approved (rather, the aircraft must meet industry consensus standards). Accordingly, FAA's final revised § 91.309(a)(2) language applicable to light-sport category aircraft uses the terms "approved by the Administrator," or "acceptable to the Administrator" with respect to the kind of tow-hitch and "acceptable to FAA" with respect to the manner of installation. The proposed language allows light-sport category aircraft the option to install a tow-hitch that is acceptable to FAA but does not have FAA approval because the aircraft itself was never subject to an FAA approval process. It also allows the use of an "acceptable" method of installation.

In contrast, aircraft holding a standard airworthiness certificate must use an FAA-approved tow-hitch and install it in a manner approved by the Administrator, which is more restrictive than the options now available to light-sport category aircraft under the new § 91.309(a)(2). Though several commenters requested light-sport category aircraft

be treated equally to standard category aircraft, FAA's intention with the revised § 91.309(a)(2) language was to allow light-sport category aircraft more flexibility than standard aircraft with respect to the kind of tow hooks that can be installed because they can be both "approved" and "acceptable" and may be installed in an "acceptable" rather than "approved" manner.

With respect to Fly Eagle Sport's comment regarding light-sport category aircraft, a tow-hitch that is part of the original equipment and therefore part of the manufacturer's authorized design would be considered acceptable to FAA. Section 91.309(a)(2)(iii) would therefore allow a light-sport category aircraft to use and install such an item if it is installed in a manner acceptable to FAA. In addition, § 91.327(b)(5) permits certain persons, other than the manufacturer, who are acceptable to FAA, to authorize alterations to a light-sport category aircraft (i.e., third-party alteration), and such alterations involving an acceptable tow-hitch would also be acceptable to FAA under § 91.309(a)(2)(iii). FAA adopted § 91.309 in the final rule, as proposed in the NPRM, without any changes.

8. Section 91.409 Clarifying Amendment

The NPRM proposed to make minor clarifying amendments to § 91.409(c)(1) by removing the first "or" and adding the words "airworthiness certificate" following the word "light-sport" within the list of special airworthiness certificates. In the NPRM, FAA stated the amendments were intended to clarify that an aircraft that carries a special flight permit, a current experimental airworthiness certificate, a light-sport category airworthiness certificate, or a provisional airworthiness certificate is excepted from the requirements in § 91.409(a) and (b). Inadvertently, the words "airworthiness certificate" following "light-sport" were not included in the proposed regulatory text of the NPRM.

In this final rule, FAA is effectuating the intent of the NPRM by adding these words. In addition, to conform with the terminology used throughout the rest of this final rule, FAA is changing the term "light-sport airworthiness certificate" to "a special airworthiness certificate in the light-sport category." For the same reason, FAA is adding the word "airworthiness" in-between "experimental" and "certificate." Paragraph (c)(1), as adopted, now reads as follows: "An aircraft that carries a special flight permit, a current experimental airworthiness certificate, a special airworthiness certificate in the light-sport category, or provisional airworthiness certificate." As noted in the NPRM, these amendments are intended to provide better clarity, readability, and understanding for the operator for proper use of the exception.

FAA received two comments on this language, from AEA/ARSA, which were both supportive of the minor technical amendments to paragraph (c)(1). However, AEA/ARSA's comments suggested that aircraft meeting light-sport performance criteria should also be exempt from the inspection requirement in § 91.409(a)(1). These associations proposed that standard airworthiness certificated aircraft that meet the performance requirements of light-sport and primary category aircraft be allowed to receive an annual condition inspection rather than an annual inspection as is currently required by § 91.409(a). The associations asserted that this revision would standardize inspection criteria and permit certificated mechanics without inspection authorizations to conduct these inspections.

In addition to these comments concerning § 91.409(a), two commenters addressed inspections for former military aircraft under § 91.409(f)(3), for which there were no amendments proposed in the NPRM. Specifically, contract air service providers, MSM and Top Aces Corp, recommended including language relating to North Atlantic Treaty

Organization (NATO) military service inspection programs in this final rule's preamble. Specifically, they noted under a previous version of FAA Order 8130.2J, which has been superseded by a newer version, Top Aces Corp's guidance allowed military contractors operating former military aircraft to comply with § 91.409(f)(3) by selecting an inspection program recommended by the manufacturer or NATO military service. MSM and Top Aces Corp requested we add clarifying language to this rule regarding this change to FAA Order 8130.2J.

In response to AEA/ARSA's comments, FAA will not be adopting any changes to proposed § 91.409(a) in the final rule. The commenters' proposed change is not in the interest of safety, as this change would standardize the yearly inspection criterion for all aircraft below 2,700 pounds regardless of the type of airworthiness certificate held. FAA disagrees with this approach to maintaining continued airworthiness. According to part 43, a qualified mechanic must maintain and inspect normal category aircraft with a standard airworthiness certificate. A mechanic with an inspection authorization is required to inspect these aircraft at least once every 12 calendar months. These heightened requirements for maintenance and inspection are consistent with where standard airworthiness certificated aircraft fall on the safety continuum. Standard airworthiness certificated aircraft fall higher on the safety continuum than light-sport category or experimental aircraft because they are approved for air carrier operations, which involve higher risks to public safety. Accordingly, these aircraft have more stringent requirements than light-sport category aircraft. For these reasons, FAA finds AEA/ARSA's suggestions outside the scope of the MOSAIC rule. FAA declines to change the inspection requirements for aircraft holding a standard airworthiness

certificate, regardless of whether an aircraft meets the light-sport performance criteria that would allow operation by a pilot holding a sport pilot certificate.

With respect to MSM's and Top Aces Corp's comments, FAA notes these comments are similarly beyond the scope of the MOSAIC rulemaking. FAA did not propose any changes to § 91.409(f)(3) in the NPRM and will not be making any changes to this section in the final rule. Accordingly, this preamble, which does not otherwise address § 91.409(f)(3), is not the appropriate platform for an interpretation of or policy discussion about this regulation.

9. Other Comments on Operations

a. ADS-B and DAA

Several individuals commented on requirements pertaining to the installation of Automatic Dependent Surveillance-Broadcast (ADS-B) technology and other equipment requirements, which are beyond the scope of the regulatory changes proposed by the NPRM. For example, one commenter expressed concern that certain aircraft such as gliders and balloons are excepted by § 91.225 and are not required to be equipped with ADS-B technology. Another expressed concern about the lack of electronic visibility of ultralights and gliders and suggested that all aircraft, including part 103 ultralight operations, be equipped with ADS-B. Another commenter opined that the MOSAIC proposal failed to require DAA technology in new light-sport category aircraft. Similarly, ALPA recommended that if light-sport category aircraft are to be authorized to operate under IFR, they should be required to comply with all the applicable instrument and equipment requirements for aircraft holding standard airworthiness certificates in § 91.205.

These comments are beyond the scope of this final rule because FAA did not propose any amendments to §§ 91.113(b), 91.205, 91.215, or 91.225 in the NPRM. Though FAA shares the commenters' mission for improving safety within the NAS by reducing midair collisions with unmanned and manned aircraft, ADS-B and DAA technology was not contemplated by this rule. Accordingly, new aircraft equipage requirements and DAA technology will not be included in this final rule, as it may require the development of a TSO performance standard for incorporation of DAA technology and the complicated subject matter would require a separate notice and public comment period. In addition, the inclusion of new equipment requirements may impose added costs on operators and may create additional training and pilot certification requirements not contemplated by this rule.

Regarding the comment from ALPA addressing aircraft equipage for certain IFR operations conducted in the NAS, FAA notes there are substantial regulations, performance standards, and equipage requirements governing IFR flight operations. As stated in the NPRM, certain light-sport category aircraft equipped for flight at night or under IFR may be issued an operating limitation stating that the aircraft must comply with the applicable instrument and equipment requirements of § 91.205. Flights under IFR in IMC would therefore have to be authorized by the manufacturer in the POH, and the aircraft would be subject to appropriate operating limitations. Section 91.327(g) allows FAA to prescribe additional limitations that it considers necessary for aircraft holding a special airworthiness certificate in the light-sport category. Accordingly, FAA will, as it does presently with other aircraft holding special airworthiness certificates, issue operating limitations allowing IFR flight for certain aircraft, using a risk-based approach that evaluates a given operator's eligibility for an operating limitation.

b. Flight Tests

Bombardier suggested that § 91.305 is too narrowly scoped, and it should be modified along with the changes to § 91.319(c) to allow for certain flight test exceptions. Specifically, Bombardier suggested that § 91.305 be modified to allow the Administrator to issue operating limitations permitting flight test operations in areas other than over open water, or sparsely populated areas having light air traffic, similar to the authorizations under § 91.319(c). In response, FAA notes that changes to § 91.305 were not proposed in this rulemaking because its applicability is narrowly tailored to allow flight for aircraft that have not yet demonstrated the ability to hold certain operating limitations. It is thus different than the scope of aircraft and operations covered by § 91.319(c). For § 91.319(c), FAA uses a risk-based approach when evaluating a given operator's eligibility to obtain certain operating limitations allowing operation over a densely populated area or in a congested airway, in accordance with the published guidance in FAA Order 8130.2. However, as a general matter, the risk to persons and property associated with allowing provisionally certificated aircraft to operate over densely populated areas is much greater than the risks associated with an aircraft holding an experimental airworthiness certificate. Because this change was not proposed in the NPRM, FAA is not addressing Bombardier's proposal in this final rule but may take this comment into consideration for future rulemaking actions.

L. Experimental Airworthiness Certificates

1. Issuance of Experimental Airworthiness Certificates (§ 21.191)

a. Operating Kit-Built and Former Light-Sport Category Aircraft (§ 21.191(i), (k), & (l))

In the NPRM, FAA proposed to remove the current § 21.191(i) experimental purpose of operating light-sport aircraft and replace it with the proposed experimental

purpose of operating former light-sport category aircraft. EAA, AOPA, NATA, and NBAA opposed the removal of the existing requirements of § 21.191(i) citing undesirable unintended consequences of not providing a "regulatory home" for these aircraft. Based upon the concerns raised by the commenters, FAA agrees and will keep the experimental purpose of operating light-sport aircraft as § 21.191(i). By doing so, a "regulatory home" will exist for aircraft certificated for this experimental purpose that may need a replacement certificate at a later date. However, upon the first effective date of this rule, [INSERT DATE 90 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER], experimental airworthiness certificates will no longer be issued for this purpose and § 21.191(i)(2) and (i)(3) will be revised accordingly to reflect this. FAA notes that experimental airworthiness certificates have not been issued under § 21.191(i)(1) since January 31, 2008. Also, on [INSERT DATE 90 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER], the reference to § 21.193 will be removed in § 21.191(i)(2) since it is an application requirement and application for original certification is no longer available for this purpose. The final rule also makes a conforming change to § 21.191(i)(1), adding the word "airworthiness" to the middle of "experimental certificate" for clarity and standardization with the phrase "experimental airworthiness certificate" in § 21.191 of this rule. Section IV.I.2 of the NPRM explained that the purpose of this terminology change is to clarify that experimental certificates are airworthiness certificates. FAA did not receive any comment on this topic. The revisions in § 21.191(i)(2) and (i)(3) also cite "experimental airworthiness certificate."

On or after [INSERT DATE 90 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER], the airworthiness certification of light-sport category kit aircraft will occur under the § 21.191(k) experimental purpose of operating light-sport

category kit-built aircraft. Likewise, the airworthiness certification of former light-sport category aircraft, currently under § 21.191(i)(3), will occur under the § 21.191(l) experimental purpose of operating former light-sport category aircraft. The titles and requirements of the § 21.191(k) and (l) experimental purposes remain unchanged from the NPRM, the only difference being their new paragraphs in § 21.191 for this final rule.

The changes in § 21.191 for these two experimental purposes were necessary because, on [INSERT DATE 365 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER], significant changes occur, such as the implementation of part 22 and the removal of the light-sport aircraft definition from § 1.1. Accordingly, without a light-sport aircraft definition, it would no longer be appropriate to issue experimental airworthiness certificates under the "operating a light-sport aircraft" purpose. However, rather than waiting for the second effective date, this rule transitions experimental kit-built and former light-sport category aircraft to § 21.191(k) and (l), respectively, at the first effective date to accommodate repairmen requirements. See section IV.I. for further discussion. Though the light-sport aircraft definition will still be in effect in § 1.1 on and after this date of transition to § 21.191(k) and (l), these experimental aircraft were previously, or are based on a model of, a certificated light-sport category aircraft under § 21.190. Accordingly, it is acceptable to use § 21.191(k) and (l) at the first effective date of this rule rather than waiting for the second effective date.

Because of these changes, the § 21.191(k) and (l) experimental purposes have been added to § 45.29(b)(1)(iii) to enable the continuity of allowing marks at least 3 inches high for former and kit-built light-sport category aircraft with a maximum cruising speed not in excess of 180 knots CAS. The § 21.191(i) reference will remain. In

addition, this final rule makes a conforming change to § 45.29(b)(1)(iii) by changing "experimental certificate" to "experimental airworthiness certificate" to remain consistent with the terminology of § 21.191 and the explanation in section IV.I.2 of the NPRM that experimental certificates are experimental airworthiness certificates. FAA did not receive any comment on this terminology change for § 21.191.

b. Weight of Experimental Kit-Built and Former Light-Sport Category Aircraft

Manufacturers of light-sport category aircraft may sell kits of their aircraft models that have already received airworthiness certification in the light-sport category; however, these kits are issued experimental airworthiness certificates. If certificated prior to [INSERT DATE 90 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER], the applicable experimental purpose is operating a light-sport aircraft per § 21.191(i)(2). On or after [INSERT DATE 90 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER], original issuance of experimental airworthiness certificates will no longer be under § 21.191(i)(2). Instead, all original certifications of light-sport category kit aircraft thereafter will be for the experimental purpose of operating light-sport category kit-built aircraft under § 21.191(k).

One commenter, building a kit aircraft with a 1,450 pounds design gross weight, favored removing weight limits for the light-sport category so their aircraft can exceed the existing 1,320 pounds weight limit applicable in the light-sport aircraft definition. FAA is concerned this commenter has misunderstood the provisions of this rule as proposed in the NPRM. First, as explained in the preceding paragraph, this commenter's kit aircraft would not be eligible for airworthiness certification in the light-sport category. Instead, it would be certificated for an experimental purpose under § 21.191(i)(2) or (k) depending if certification occurs before, or on or after [INSERT DATE 90 DAYS

AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]. Second, though this rule will not impose a maximum takeoff weight restriction for light-sport category aircraft, it does not mean that a weight limit no longer applies to kits sold prior to [INSERT DATE 365 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER] but certificated on or after this date. In this instance, the manufacturer's statement of compliance that accompanied the commenter's kit specified a maximum takeoff weight of 1,320 pounds or less and this weight limit must be complied with, especially since some of the performance data and limitations in the aircraft's POH are based on this gross weight.

Another commenter asked about the ability to change the gross weight of experimental light-sport category aircraft. Though there is no regulatory requirement for former or kit-built experimental light-sport category aircraft to maintain the same configuration and gross weight limitations as the light-sport category model upon which the experimental aircraft is designed after, it is unsafe for owners of experimental light-sport category aircraft to exceed the manufacturer's maximum weight limits or any other design limit that is published in the aircraft's POH.

c. Operating Former Military Aircraft (§ 21.191(j))

The NPRM included a new provision § 21.191(k) for issuance of an experimental airworthiness certificate to former military aircraft to improve alignment between certain operations of former military aircraft and the experimental airworthiness certificates which authorize their operation. FAA received comments from 11 commenters, nine supportive and two opposed. Of the nine supportive commenters, eight proposed changes to this proposal.

NAVAIR generally concurred with this proposal to facilitate civil operations of former military aircraft that also engage in public aircraft operations but recommends several changes. First, NAVAIR recommended that FAA consider deleting § 21.191(k)(1) to enable inclusion of unmanned aircraft in § 21.191(k) as former military aircraft. Due to the significant airworthiness and operational differences between unmanned and manned aircraft, FAA excludes unmanned aircraft certification from this rulemaking. Such a change would require much broader consideration and amendment of 14 CFR requirements than the intended scope of this rulemaking.

NAVAIR provided the following comments concerning what aircraft would be considered former military aircraft under § 21.191(k)(2) and, therefore, eligible for a U.S. airworthiness certificate under this section. NAVAIR commented that the proposed rule lacks sufficient clarity in whether the phrase "under contract by the U.S. Armed Forces or a foreign military" applies to manufacture, purchase, and modification or only to modification. FAA agrees that use and placement of the phrase, "under contract," may be unclear. FAA intends for this purpose for issuing experimental airworthiness certificates for operating former-military aircraft to include aircraft manufactured, purchased, or modified by the U.S. Armed Forces or a foreign military, whether the military entity performed any of these actions itself or via a contract. Since a military can be said to have accomplished any of these actions in either case, the phrase, "under contract" is unnecessary. The final rule text is amended to delete the phrase, "under contract" for clarity. This revision does not change the intent of the provision.

NAVAIR also commented that the provision does not explicitly allow ownership or registration by a military as an additional method to be considered for establishing the eligibility status of a former military aircraft. NAVAIR recommended modifying

§ 21.191(k)(2) to add the option of the aircraft being on the registry of the U.S. Armed Forces or a foreign military or using "accepted for use by" language like that in § 21.25(a)(2). As discussed in the previous paragraph, since the proposed rule was intended to include aircraft "purchased by the U.S. Armed Forces or a foreign military," this proposal would include aircraft owned by a U.S. Armed Force or foreign military. Similarly, FAA considers former registration by a military entity to represent an acceptable means of establishing an aircraft as a former military aircraft and amended the text to include this as another option. To qualify as a former military aircraft, the aircraft must have first been a military aircraft. In FAA's view, former registration by a military entity represents a firmer relationship of the military with the aircraft than simply via "acceptance for use by" the military. Accordingly, FAA will revise the proposed language to delete the first "or" before "modified" and add ", or on the registry of" before "the U.S. Armed Forces."

NAVAIR also recommended clarification to affirm that former military aircraft that are subsequently modified by a civilian operator for use under a contract with the U.S. Armed Forces be considered former military aircraft under § 21.191(k)(2). FAA notes that contract air services provided by a civilian organization for a military entity using former military aircraft would not negate the former military status of such aircraft.

NAVAIR also recommended adding a definition of "former military aircraft" to 14 CFR. With clarifications of the intent and amendments of this text as recommended, FAA has determined the resultant text is sufficient to enable issuance of airworthiness certificates for former military aircraft under this section without the added complication of creating a new definition of the term, "former military aircraft."

NAVAIR commented there are civil aircraft with no prior military pedigree that have been modified by the owner/operator to support contracted public aircraft operations for the U.S. government and asked FAA to consider repositioning provisions like those of § 21.191(k)(3)(iii). This proposed rule centered on creating a new experimental purpose for former military aircraft. Since this proposed rule did not address civil aircraft with no prior military pedigree, this NAVAIR recommendation exceeds the scope of this rulemaking. As such, FAA will not consider this recommendation under this final rule.

NAVAIR and IAR recommended increasing the scope of repositioning flights under § 21.191(k)(3)(iii). NAVAIR recommended changing the proposed rule from repositioning the aircraft for use under contract "with the U.S. Armed Forces" to "for a public aircraft operation." This would allow repositioning flights of former military aircraft for other public aircraft operations with other U.S. government agencies, such as the National Aeronautics and Space Administration or the Department of Agriculture. FAA recognizes that former military aircraft are suitable for and perform valuable public services in a wide variety of operations for a wide variety of U.S. government organizations. As such, FAA agrees this provision should not be limited to enabling public aircraft operations under contract with the U.S. Armed Forces. Accordingly, this rule will broaden the proposed rule to enable the reposition of former military aircraft for any public aircraft operation. IAR recommended revising this text to allow repositioning flights for any purpose. IAR did not provide, and FAA is not aware of, a safety case for an unlimited provision for repositioning former military aircraft. Accordingly, FAA will not amend the text to create an unlimited provision for repositioning former military aircraft.

NAVAIR, Draken International, MSM, and IAR recommended expanding § 21.191(k)(3) to include other operating purposes. NAVAIR and Draken International recommended increasing the scope of § 21.191(k)(3) to enable operations following repair, alterations, or maintenance. FAA notes that check flights following a repair, alteration, and maintenance are required under § 91.407 when tests and inspections on the ground are insufficient to find that a repair, alteration, or maintenance have not appreciably changed the flight characteristics or substantially affected the flight operation of the aircraft. Accordingly, FAA agrees that § 21.191(k)(3) should be amended to specifically allow check flights following a repair, alteration, or maintenance.

Draken International and MSM recommended increasing the scope of § 21.191(k)(3) to include flight training and another commenter recommended including pilot proficiency and exhibition. In response, FAA concludes these changes are unnecessary since experimental purposes for flight training and exhibition already exist under § 21.191(c) and (d), respectively. An applicant for a U.S. airworthiness certificate may apply for multiple experimental airworthiness certificates or a single, multi-purpose certificate under one application. Regarding the pilot proficiency recommendation, of all the experimental purposes under § 21.191, only exhibition and air racing include provisions for "maintenance of exhibition flight proficiency" and "practicing for such air races" under § 21.191(d) and (e), respectively, reflecting the unique operating characteristics of an exhibition or race that warrant practice above and beyond fundamental flight operations. Since the new experimental purpose of operating former military aircraft simply enables relocation of certain aircraft under certain conditions, these operations involve the most fundamental of pilot skills that are most appropriately developed and maintained under the experimental purpose of crew training under

§ 21.191(c). Proficiency operations are feasible under the experimental purpose of crew training and will not be enabled under the new experimental purpose of operating former military aircraft.

One commenter stated all amendments concerning experimental and restricted category certification of former military aircraft should be removed from this rule and addressed separately from rulemaking concerning the light-sport sector. The original rules[317] establishing the restricted category in 1950 included provisions for military aircraft. As discussed in the NPRM, FAA is already issuing experimental airworthiness certificates to former military aircraft. That is, civil registration, certification, and operation of former military aircraft has been occurring for nearly 75 years. This rule merely clarifies a longstanding provision in § 21.25 and establishes a new experimental purpose under § 21.191 to better align the purpose of the certificate with the intended operation. FAA, therefore, does not find merit with the commenter's recommendation for removing these changes for separate rulemaking.

One commenter opposed this proposal for several reasons. First, the commenter asserted that FAA would exceed its responsibilities for civil aviation in enabling operation of former military aircraft that engage part-time in public aircraft operations for the Department of Defense (DoD). This is incorrect. The FAA airworthiness certificate would apply to civil aircraft operations only and would not be in effect when the aircraft is operating as a public aircraft.

Second, the commenter asserted FAA allows operators of former military aircraft to operate some aircraft beyond their military design life limits, asserting this is very risky as the Armed Forces took them out of service because of such life limits. This is incorrect. Per § 91.319(i), FAA may prescribe additional operating limitations for

experimental aircraft that it considers necessary. As such, an operating limitation issued with experimental airworthiness certificates per appendix D of FAA Order 8130.2, Airworthiness Certification of Aircraft, requires compliance with applicable life limits. Furthermore, FAA only issues an experimental airworthiness certificate for a former military after reviewing aircraft records, inspecting the aircraft, identifying appropriate operating limitations, and making a finding the aircraft is in a condition for safe operation; this process may result in requirements to remove or disable some systems to establish conditions for safe operation for the intended use.

Third, the commenter asserted that operations of these aircraft involve additional risk related to the availability of replacement parts. FAA notes that each owner of a civil aircraft is required to maintain its aircraft in a condition for safe operation for its airworthiness certificate to remain valid.

Fourth, the commenter asserted that FAA is exceeding its authority in enabling training of warfighters with civil aircraft. This is incorrect. An aircraft may be operated alternately in civil and public aircraft operations. FAA has no responsibility for, or involvement with, public aircraft operations. The civil airworthiness certificate is not in effect during public aircraft operations. EAA, AOPA, NATA, and NBAA jointly expressed support for this proposal while noting it would not impact historic former military aircraft flown for display ("warbirds") under § 21.191(d).

Lastly, the final rule revises the paragraph numbering for this section from § 21.191(k) (proposed) to § 21.191(j).

2. Application for Special Airworthiness Certificates Issued for Experimental Purposes (§ 21.193)

a. Experimental Purpose Change in § 21.193(e)

To align with the start of the operating light-sport category kit-built aircraft (§ 21.191(k)) experimental purpose and the cessation of the issuance of original certificates under § 21.191(i)(2) on [INSERT DATE 90 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER], § 21.191(k) will replace § 21.191(i)(2) in the current § 21.193(e) requirement.

b. Comments on Program Letters

The provisions in § 21.193 require applicants for an experimental airworthiness certificate to provide the necessary details to FAA so that it can understand the purpose and scope of an applicant's experiment and operations. These details will allow FAA to ensure an airworthiness certificate is being issued for the appropriate experimental purpose and duration and create or apply appropriate operating limitations for safe operations.

GAMA, Manufacturers Flight Test Council, and Textron asked if the changes to § 21.193 will affect the current program letter process and expressed that program letter updates can be burdensome, especially in a flight test environment.

The policies and procedures for program letters are in FAA Order 8130.2, Airworthiness Certification of Aircraft. The provisions in § 21.193 of this final rule will not change the program letter process. Applicants will still use program letters to provide the information in § 21.193 to FAA's certificating office when applying for an experimental airworthiness certificate. While preparing a program letter can take time and divert resources from a flight test program, FAA uses program letter information to create appropriate operating limitations. These operating limitations mitigate the risks of experimental aircraft and developmental flight test activities and serve to protect the general public. Since § 21.181 of this rule expands the certificate duration of certain

experimental purposes from one year to three years, unless FAA prescribes a shorter period, it is imperative that applicants provide FAA with the necessary information for the desired duration of the experimental airworthiness certificate. Providing this necessary information will reduce the need for amendments to program letters, amendments to operating limitations, and potential impacts to flight testing schedules.

Another commenter similarly stated the annual letter for experimental gliders is an onerous task that is a waste of time for FAA personnel and such letter is unnecessary if the glider is well maintained. Though not specified by the commenter, the comment likely refers to the annual program letter for the experimental purpose of exhibition. Unlike other experimental airworthiness certificates with unlimited duration, owners of any aircraft operated for the experimental purpose of exhibition or air racing must submit an annual program letter to FAA per the assigned operating limitation. The applicant provides a list of events at which the aircraft will be exhibited over the upcoming year. FAA disagrees with the commenter as this annual program letter is necessary to show FAA that the aircraft will be operated for the purpose for which the experimental airworthiness certificate was issued per § 91.319(a).

c. Light-Sport Kit Aircraft Application Information (§ 21.193(h))

EAA, AOPA, NATA, and NBAA opposed the proposed move of special airworthiness application requirements for light-sport category kit-built aircraft from § 21.193 to the proposed § 21.191 experimental purpose of operating light-sport category kit-built aircraft. The commenters found this change unnecessary and confusing and recommended that these application requirements remain in § 21.193. Upon further consideration of the comments received, FAA agrees it is unnecessary to put application requirements in a section that describes experimental purposes. This rule will retain the

application requirements for light-sport category kit-built aircraft in § 21.193. However, proposed § 21.193(h), which concerns evidence of compliance with applicable noise limits in part 36, has been omitted since noise compliance for experimental kit and former light-sport category aircraft is voluntary in this final rule.

Hartzell Propeller cited a situation where a kit builder may have started their light-sport category kit aircraft prior to the effective date of this rule and completed it afterwards. With the implementation of voluntary part 36 noise requirements in this final rule and the omission of proposed § 21.193(h), this comment is no longer relevant since kit aircraft are not subject to mandatory noise compliance.

In this final rule, a correction was made to proposed § 21.191(j)(4), which the final rule relocates to § 21.193(h)(4). In the NPRM, this section incorrectly cited § 22.175 (noise) when § 22.195 (ground and flight testing) should have been cited. The NPRM preamble correctly explained that light-sport kits do not have to be ground and flight tested by the manufacturer in accordance with production acceptance test procedures. This is because the kits are assembled away from the manufacturer's facilities by amateur or contract builders. This correction aligns with the existing requirement in § 21.193(e)(4).

3. Experimental Purpose of Market Survey, Sales Demonstrations, Customer Crew Training (§ 21.195)

The NPRM proposed amendments to clarify § 21.195. No comments were submitted to the docket concerning this proposal. For the final rule, "airworthiness" was added to the NPRM proposed § 21.195 to change references to "experimental certificate" to "experimental airworthiness certificate" in the title and subsections (a), (b), (c), and (d) of § 21.195. This was a conforming change to retain consistent use of "experimental

airworthiness certificate" throughout this rule. In discussing this terminology change in § 21.191, NPRM section IV.I.2 explained this change was to clarify that experimental certificates are airworthiness certificates. This final rule amends this section to make such changes as are necessary to advance the intent of the rule.

4. Duration of Experimental Airworthiness Certificates (§ 21.181(a)(4) and (a)(5))

In § 21.181(a)(4), the NPRM proposed to extend the duration of an experimental airworthiness certificate issued for certain experimental purposes from one to three years from the date of issue or renewal unless FAA prescribes a shorter period. With the retention of the § 21.191(i) experimental purpose, "operating light-sport aircraft," discussed in section IV.L.1.a, this final rule adds this purpose to § 21.181(a)(5). The certificate duration of the § 21.191(i) purpose will be maintained in this rule. No comments were submitted to the docket concerning the § 21.181(a)(4) proposal or the duration of the operating light-sport aircraft experimental purpose.

This final rule adds "airworthiness" to references to "experimental certificate" in proposed § 21.181(a)(4) and (a)(5) to clarify these durations are for experimental airworthiness certificates and to retain consistent terminology throughout this rule. The basis for this terminology change was discussed in section IV.I.2 of the NPRM, and FAA did not receive any comment on changing this terminology. In addition, the sequence of the experimental purposes in proposed § 21.181(a)(5) was changed to align with their sequence in § 21.191. This final rule will retain § 21.181(a)(4) as proposed, except for the addition of "airworthiness," and has added "operating light-sport aircraft" and "airworthiness" to § 21.181(a)(5).

5. Other Comments on Experimental Airworthiness Certificates

Several commenters asked if a particular legacy aircraft could be operated under an experimental airworthiness certificate for one of the experimental purposes related to light-sport category aircraft. In response, FAA notes that eligibility regulations in current § 21.190 and final rule § 22.100 prohibit aircraft previously issued a standard, primary, restricted, limited, or provisional airworthiness certificate, or an equivalent airworthiness certificate issued by a foreign civil aviation authority, from obtaining a special airworthiness certificate in the light-sport category. The experimental purposes related to light-sport category aircraft require either prior airworthiness certification under § 21.190 or be based on a make and model that was previously certificated under § 21.190. Therefore, legacy aircraft could not operate under the experimental purpose related to light-sport category aircraft in § 21.191(i), (k), or (l).

GAMA asked for additional clarification regarding the airworthiness certification procedures for aircraft manufactured outside the U.S., in particular, clarification on how an aircraft gains airworthiness in the U.S. if it already has an existing airworthiness certificate from another regulatory entity.

For airworthiness certification in the light-sport category, aircraft manufactured outside the U.S. that meet the eligibility requirements of § 21.190 (current) or § 22.100 on or after [INSERT DATE 365 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER], may apply for a special airworthiness certificate for the light-sport category. As previously mentioned, aircraft that have previously been issued a standard, primary, restricted, limited, or provisional airworthiness certificate, or an equivalent airworthiness certificate issued by a foreign civil aviation authority, would not be eligible for airworthiness certification under § 21.190. Accordingly, these aircraft would also not be eligible for the experimental purposes, § 21.191(i), (k), or (l), since

these purposes require the aircraft to have either previously held an airworthiness certificate issued under § 21.190 or be based on a previously certificated light-sport category aircraft make and model. In addition, for a light-sport category aircraft or kit manufactured outside the U.S., §§ 22.100 and 21.193 require that the aircraft or kit, respectively, would have to be manufactured in a country with which the U.S. has a Bilateral Airworthiness Agreement concerning airplanes or a Bilateral Aviation Safety Agreement with associated Implementation Procedures for Airworthiness concerning airplanes, or an equivalent airworthiness agreement.

ANAC suggested that FAA consider replacing the term "experimental" with the term "flight permit." It stated the adoption of this term may help in acknowledging the inherent risks involved and convey the idea that the approval of flight conditions is not related to the safety of the design. FAA disagrees with this suggestion as the term "experimental" has been used with the registration or airworthiness certification of U.S. aircraft for nearly the past century. Because of this long history and the widely accepted use and understanding of "experimental," FAA will continue to use the term for airworthiness certificates issued under § 21.191. The "experimental" marking requirements of § 45.23 and the § 91.319 requirement that each person carried be advised of the experimental nature of the aircraft are in place to bring crew and passenger awareness that the design may not conform to more rigorous airworthiness requirements.

M. Restricted Category Aircraft

1. Amendments of Special Purpose Operations (§ 21.25)

The NPRM included amendments to § 21.25 to clarify text, exclude aircraft previously certificated in the light-sport or primary categories from eligibility for type

certification in the restricted category, and to add special purpose operations. Comments were submitted on multiple aspects of § 21.25.

IAR raised several concerns related to restricted category aircraft. Several other commenters supported all the comments submitted by IAR. IAR commented that the agency must consider prior correspondence it submitted to the agency. IAR submitted the correspondence prior to, and outside of, the NPRM comment process, asserted that the correspondence contained proprietary and confidential business information, and requested that FAA contact IAR if the agency could not find it.

As a general matter in responding to comments, the agency considers the information actually submitted in a comment. While the NPRM provided that "FAA will consider all comments it receives on or before the closing date for comments," FAA only considers information it receives as part of the comments submitted to the NPRM.[318] Public comments on the docket available for all to see better enable transparency in what information the government considered in reaching the final rule. In addition, to separately to seek out this additional information would both be unfair to other commenters that similarly referenced or requested that FAA seek out information they failed to submit to the docket and would likely represent ex parte communications, which would then implicate the need to reopen the comment process to offer similar opportunities to other commenters, adding further delays to issuing this final rule and realizing the benefits it will generate, and would potentially create a perception that the government was favoring a commenter by seeking out additional information from it. Based upon the above, FAA did not seek out these correspondences.

IAR also commented that the NPRM provided inadequate notice to the public and that IAR believes many restricted category aircraft operators may not be aware of the

MOSAIC rulemaking or its scope. IAR recommended that the changes to the restricted category should be done in a separate rulemaking. Similarly, another commenter stated changes to the restricted category should be done separately from these light-sport category regulations. FAA disagrees that the public received inadequate notice of the NPRM. FAA notes that a restricted category aircraft that meets the requirements of § 21.185 is issued a special airworthiness certificate. As such, the title of this proposal, "Modernization of Special Airworthiness Certification," indicates applicability to restricted category aircraft. The summary paragraph on the first page of the NPRM includes discussion of amendments concerning restricted category aircraft. In addition, the table of contents on the first page of the NPRM shows that supplemental information for amendments related to the restricted category is included in section IV.J of the NPRM. That is, the restricted category is referenced or discussed three times on the first page of the NPRM and discussed at length in section IV.J of the NPRM. The initial comment period for this proposal closed 90 days after its publication on October 23, 2023. Based on a request from multiple commenters, FAA extended the comment period by 90 days to January 22, 2024. Finally, pursuant to 44 U.S.C. 1507, publishing the NPRM in the *Federal Register* constituted constructive notice to the public. It is incumbent on the public to review and respond to that notice.

In summary, there was clear indication that the NPRM addressed the restricted category, the public was provided six months to submit comments to the docket, and FAA fulfilled its statutory obligations to publish proposed rules in the *Federal Register*. FAA has discretion in choosing which amendments it combines under a given rulemaking action. This rulemaking is a combination of many different proposals related to special airworthiness certification, and this change concerning type-certification of

restricted category aircraft is well within the scope of these proposals since restricted category aircraft are issued special airworthiness certificates. Accordingly, FAA finds the public was provided sufficient notice of proposed amendments concerning restricted category aircraft, FAA exercised appropriate discretion for combining amendments under this rulemaking, and, except for changes as discussed herein, FAA will proceed with final rulemaking as proposed concerning restricted category aircraft.

MSM and Top Aces Corp recommended that eligibility for restricted category type certification be expanded to include U.S. military aircraft that have been accepted by foreign militaries. FAA notes the proposed amendments in the NPRM concerning eligibility for restricted category type certification were clarifications only, not substantive changes. The NPRM did not consider or discuss expanding eligibility to military aircraft from other than the U.S. Armed Forces. As such, FAA disagrees with this recommendation for this final rule as it would be a substantive change that exceeds the scope of this rulemaking and would require appropriate notice to the public and opportunity for comment.

NAVAIR requested clarification of the phrase "accepted for use by" in § 21.25(a)(2)(i) concerning aircraft accepted for use by the U.S. Armed Forces. NAVAIR was uncertain whether this phrase means an aircraft type "operated by" or "on the registry of" the U.S. Armed Forces. NAVAIR stated this difference may affect the eligibility of certain military aircraft types the U.S. Armed Forces acquires for foreign military sales. FAA specifically avoided requirements in this section for establishing specific documentation, registration requirements, bailing arrangements, and such for establishing whether an aircraft was accepted for use and operated by a U.S. Armed Force, especially since those methods and records may not be standardized across all U.S.

Armed Forces and may be subject to change. Each applicant for restricted category type certification under this section will be responsible for showing evidence that the aircraft type was accepted for use by the U.S. Armed Forces to be eligible for type certification in restricted category.

NAVAIR requested clarification of the requirement in § 21.25(a)(2)(ii) that the "aircraft is of a type that has a service history with the U.S. Armed Forces acceptable to FAA." Specifically, NAVAIR asked whether service history concerns an individual aircraft or an aircraft type. FAA notes that § 21.25(a)(2) intentionally uses the word "type" to highlight that this is not referring to individual aircraft, just as a type certificate in the restricted category is not issued to individual aircraft. FAA extends eligibility for restricted category type certification to certain aircraft that were manufactured in accordance with the requirements of and accepted for use by the U.S. Armed Forces. In issuing restricted category type certificates under § 21.25(a)(2), FAA relies on the collective rigor of military development, design, test, manufacture, operations, and continued operational safety through service experience to attain the level of safety intended for the restricted category. For example, FAA would be concerned with finding compliance for restricted category type certification for a military aircraft type that was cancelled before accruing some minimally acceptable service history to identify and correct unsafe conditions.

NAVAIR recommended replacing the term "U.S Armed Forces" with "a U.S. Armed Force" in § 21.25(a)(2)(i) and (a)(2)(ii). Section 1.1 defines "Armed Forces" and the rules of construction in § 1.3(a)(2) state that, "Words importing the plural include the singular." FAA prefers using a defined term as permitted by this rule of construction. Accordingly, this final rule retains the term, "U.S. Armed Forces."

IAR commented that FAA's "petition process" for approval of a new special purpose operation is "cumbersome, time consuming, and lengthy," the public comment required by the petition process can dissuade companies from pursuing new special purposes, and that FAA failed to act on some requests. IAR, therefore, recommended replacing the list of special purpose operations in § 21.25(b) with a provision to permit any aerial work operations as long as the aircraft meets § 21.185(b). IAR commented that this approach would eliminate individual approvals for each type of aerial work operation. Alternatively, IAR recommended adding aerial work along with approximately 10 other special purpose operations to § 21.25(b). Similarly, two other commenters requested new special purpose operations. NAAA recommended adding "any agricultural aircraft operations under part 137" to § 21.25(b)(1). NAVAIR recommended adding "patrolling of waterways" and "patrolling of oceans" as additional special purpose operations.

As to IAR's concerns with the petition process for approval of a new special purpose operation, FAA does not agree with IAR's characterizations of the petition process. FAA is unaware of failures to act on requests submitted using its process, and no specific information on such asserted failures was provided in the comment. Public notice of, and public comment on, requests for new special purpose operations is a valuable process that provides transparency to the public and an opportunity for the public to provide information and its comments and thoughts on such requests.

Regarding IAR's recommendation to replace the list of special purpose operations in § 21.25(b) with an "aerial work" provision for aircraft that meet § 21.185(b), IAR's proposal is internally inconsistent in that the requirements of § 21.185(b) include a requirement that aircraft be type certificated in the restricted category. Furthermore,

§ 21.25(a) affirms that a type certificate in the restricted category is issued for one or more special purpose operations. That is, an aircraft inspection for issuance of an airworthiness certificate under § 21.185(b) cannot circumvent regulatory requirements for issuance of restricted category type certificate for one or more special purpose operations. As such, this comment does not explain how replacing the list of special purpose operations with a single aerial work provision would meet the § 21.25 requirement that an applicant for a restricted category type certificate "shows that no feature or characteristic of the aircraft makes it unsafe when it is operated under the limitations prescribed for its intended use" as reflected in the issuance of a type certificate of that special purpose operation. Finally, the NPRM did not consider or discuss such a proposal. As such, it would be a substantive change that exceeds the scope of this rulemaking and would require appropriate notice to the public and opportunity for comment. Based upon all the above, FAA disagrees with this recommendation for this final rule.

As to the recommendations proposed above to add new special purpose operations, petitioning FAA for consideration of a new special operating purposes under the authority in § 21.25(b)(7) can be done using the process in FAA Order 8110.56, Restricted Category Type Certification. The Order advises applicants to provide information, views, and arguments to support the proposed special purpose operation and the petition process includes FAA seeking public comment in the *Federal Register*. FAA updates FAA Order 8110.56 with any newly approved special purpose operations. Because FAA has an established process for considering such petitions and such process provides for appropriate public notice of such petitions and opportunity for public comment, FAA deems it more appropriate to consider such recommendations through that established process.

IAR commented that the proposed list of special purpose operations does not reflect the agency's commitment to performance-based regulations. IAR asserted that rather than generalizing common operations, the rule, for example, unnecessarily prescribes multiple types of special purpose operations for patrolling and aerial surveying. Though FAA embraces performance-based regulations, 14 CFR rules are comprised of many legacy rules that are more prescriptive in nature. During rulemaking, FAA makes challenging decisions of whether to make simpler amendments of legacy, prescriptive rules or more fundamentally amend such rules using performance-based concepts. For § 21.25, the proposed rule was limited in nature and did not fundamentally amend provisions concerning the issuance of type certificates for restricted category aircraft. As such, the NPRM did not propose or discuss eliminating the list of special purpose operations in § 21.25(b) in favor of a more performance-based approach, which would be significantly different than the more limited changes in this final rule. Consideration of such a new approach to special purpose operations would require appropriate notice to the public and opportunity for comment. As such, this recommendation to revamp FAA's approach to special purpose operations exceeds the scope of this rulemaking.

GAMA, NAAA, and Air Tractor commented that the addition of the word "crop" to § 21.25(b)(1)(i) may exclude currently approved agricultural special purpose operations that do not treat a specific crop. FAA did not intend for the proposed rule to limit current operations in any way but recognizes that the addition of the word "crop" could have that unintended effect on agricultural special purpose operations. Accordingly, this final rule eliminates the word "crop" from the § 21.25(b)(1)(i) that was proposed in the NPRM.

GAMA, NAAA, and Air Tractor asked which special purpose operations an applicant would be approved under § 21.25 for a previously issued type certificate that includes multiple special purpose operations and other uses for which the special purpose operation is not specified. Operators may continue to perform approved operations without updating the TCDS or airworthiness certificate. Since 2006, FAA specifies approved special purpose operations on the TCDS for restricted category aircraft. For a TCDS issued before 2006, future revisions of that TCDS may clarify the approved special purpose operations. For questions about which special purpose operations are approved under a type certificate for a restricted category aircraft, contact the issuing office for that type certificate.

IAR commented that it opposes any change that would limit the ability of restricted category aircraft to support space vehicle launches. FAA approved the special purpose operation of space vehicle launching using the process in FAA Order 8110.56, including notification in the *Federal Register*.[319] The proposed rule intended to merely codify this previously approved special purpose operation without change but added the word "support" in error. Correcting this error affirms that no change is intended in the use of this special purpose operation as approved. FAA therefore adopts § 21.25(b)(7)(viii) as proposed but deletes the word "support."

ALPA also expressed concern with the proposed amendment to § 21.25 to codify space support vehicle and space support vehicle flights, but ALPA did not specify what the concern was, and § 21.25 does not use these terms.

Concerning approval of new special purpose operations under § 21.25(b)(7), IAR commented that uses should be allowed unless the aircraft cannot satisfy § 21.185. This comment incorrectly conflates the requirements for issuance of a restricted category type

certificate under § 21.25 with requirements for issuance of an airworthiness certificate for restricted category aircraft under § 21.185. Section 21.25 contains the requirements for type certification in the restricted category.

GAMA and NAAA recommended modification of § 21.25(a)(2)(i) to clarify that an aircraft produced under an FAA type and production certificate, modified, and accepted for use by a U.S. Armed Force would be eligible for a restricted category type certificate under this section. FAA finds the language in § 21.25 is sufficiently broad to accommodate the scenario described by the commenter. An aircraft that was produced under an FAA type or production certificate and then entered service with a U.S. Armed Force is eligible to be type-certificated in the restricted category by complying with § 21.25(a)(2). Alternatively, the aircraft may be able to be conformed to its standard classification type certificate. No changes to this paragraph are necessary.

Streamline Designs disagreed with the exclusion of primary and light-sport category aircraft from eligibility for type certification in the restricted category and commented that the NPRM does not include a supporting safety argument for this proposal. Also, Streamline Designs asserted that if a light-sport category aircraft may conduct the same operation as a restricted category aircraft, it would be limiting to exclude that aircraft from eligibility for certification in the restricted category. NPRM paragraph IV.J.1 discussed the safety argument for excluding primary and light-sport category aircraft from eligibility for type certification in the restricted category. Also, FAA notes several types of operations are common among various aircraft categories. For example, operations for sport, recreation, personal travel, flight training, and towing may be conducted with experimental, light-sport category, primary category, and normal category aircraft. Regardless, certain shared operating privileges do not render an aircraft

that was certificated in one category eligible for certification in a higher category on the safety continuum. Similarly, just because light-sport and restricted category aircraft may share similar operating privileges for certain aerial work does not mean that light-sport category aircraft should be eligible for certification in the restricted category. Its higher placement on the safety continuum means the rigor of certification standards and procedures for restricted category aircraft are greater than aircraft lower on the safety continuum, including light-sport and primary category aircraft. Accordingly, FAA affirms its position that light-sport and primary category aircraft are not eligible for certification in the restricted category.

FAA made a technical correction to § 21.25(b)(4)(i) through (vi) in the final rule by omitting "patrolling of" in the special purpose operations since the lead-in statement already included "patrolling" and "patrolling of" was redundant. This technical correction does not change the intent of the provision.

2. Corrections to Issuance of Restricted Category Airworthiness Certificates (§ 21.185)

The NPRM proposed amendments to § 21.185 to standardize terminology concerning special purpose operations and to correct § 21.185(a) by removing "original issue of" because "original" specifies compliance with the applicable requirements of § 21.183 only for the original issuance of a restricted category airworthiness certificate. This causes confusion in situations wherein a restricted category aircraft's airworthiness certificate must be re-issued. The public submitted multiple comments concerning § 21.185.

After issuance of the NPRM, FAA noticed that in removing "original issue of" to clarify the applicability of § 21.185(a) for the issuance of recurrent airworthiness

certificates for used aircraft, this change did not correctly apply the statutory requirements for issuance of an airworthiness certificate for such aircraft. As written, the proposed rule would have the unintended effect of expanding the scope of the reference in this paragraph to § 21.183 to include inspections under § 21.183(d) for used restricted category aircraft. Such inspections have not been required under § 21.185, were not intended or described in the proposed rule, and would constitute an unintended expansion of the scope of requirements under § 21.185(a). Therefore, this final rule amends § 21.185(a) to refer only to paragraphs § 21.183(a) and (b) as applicable rather than all of § 21.183. Also, 49 U.S.C. 44704(d)(1) mandates that, "(t)he Administrator shall issue an airworthiness certificate when the Administrator finds that the aircraft conforms to its type certificate and, after inspection, is in condition for safe operation." Therefore, this final rule corrects § 21.185(a) to align with the statute and require that a used aircraft conform to its type certificate and be in a condition for safe operation.

IAR commented that the NPRM proposes a significant new requirement that an aircraft be type certificated for a special purpose operation to be eligible for issuance of a special airworthiness certificate under § 21.185, including an aircraft that is in a good state of preservation and repair, in a condition for safe operation, and capable of conducting that special purpose operation. IAR also commented that design changes to enable certain special purpose operations do not always specify the intended special purpose operation. IAR strongly recommended removal of this proposal for consideration under separate rulemaking.

FAA notes that prior to the NPRM, § 21.185(b) applied to "An applicant for a restricted category airworthiness certificate for an aircraft type certificated in the restricted category," and § 21.25(a) entitled an applicant to a type certificate for

an aircraft in the restricted category for special purpose operations. That is, currently §§ 21.185(b) and 21.25(a) require type certification in the restricted category, and for specific special purpose operations, respectively. Furthermore, 49 U.S.C. 44704(d) requires, in part, that FAA "shall issue an airworthiness certificate when the Administrator finds that the aircraft conforms to its type certificate. . .." Conformity to a restricted category type certificate includes conformity to requirements applicable to the approved special purpose operation. Contrary to IAR's comment that the NPRM proposes a significant modification and a new requirement for § 21.185(b)(1), that proposal does not add anything new to what was previously required. As described in the NPRM, amendments of § 21.185(b)(1) merely clarify current requirements.

FAA notes that a type certificate includes changes to a type certificate approved under subpart D of part 21. Such changes may include a supplemental type certificate or a minor change in type design under § 21.95. When the modification is not a major design change, other FAA-approved data may take the place of the restricted supplemental type certificate (STC). In this case, an FAA aviation safety inspector (ASI) can issue the restricted category airworthiness certification based on review of applicable aircraft records and an aircraft inspection. Regardless, any design change that adds a new special purpose operation for an aircraft would require an amendment of the airworthiness certificate to include that special purpose operation. Neither the NPRM nor this final rule changes these requirements. In summary, the proposed rule clarifies existing requirements. As such, FAA disagrees with the commenter's recommendation to withdraw this proposed rule for separate rulemaking.

One commenter stated §§ 21.25 and 21.185 seem to indicate that FAA may issue a special airworthiness certificate for restricted category aircraft based on an aircraft

inspection without finding that the aircraft conforms to a type certificate that includes the applicable special purpose operation. FAA notes even before the NPRM, § 21.185(a), (b), and (c) included requirements for type certification in the restricted category as conditions for issuance of airworthiness certificates under this section. Furthermore, the entitlement for issuance of a type certificate in the restricted category under § 21.25(a) is for specific special purpose operations. That is, issuance of a restricted category type certificate, including an STC, for a special purpose operation is a prerequisite for issuance of an airworthiness certificate under this section for that special purpose operation. Lastly, if a modification is not a major design change, other FAA-approved data may take the place of the restricted STC. In this case, an FAA ASI can issue the restricted category airworthiness certificate based on review of applicable aircraft records and an aircraft inspection. The NPRM and this final rule clarify but do not substantively amend these requirements. FAA is also clarifying related implementing policies and procedures for FAA inspectors and designees.

One commenter requested clarification on the meaning of "good state of preservation and repair" in § 21.185(b)(3). This phrase already exists in § 21.185(b) and is not defined elsewhere in 14 CFR. This rule merely relocates this language within § 21.185 but does not change it. This language will continue to have the same meaning it had prior to this final rule. However, FAA recommends that the commenter consider following the directive feedback process of appendix K of FAA Order 8130.2, Airworthiness Certification of Aircraft, to request clarification of this phrase.

Streamline Designs commented that the parenthetical phrase "other than primary category or light-sport category" in NPRM proposed § 21.185(b)(2)(ii) incorrectly implies that light-sport category aircraft are type certificated. Accordingly, Streamline

Designs recommends deleting this parenthetical phrase. On further review, FAA finds that this parenthetical phrase is unnecessary since § 21.25 already excludes light-sport and primary category aircraft from type certification in the restricted category. FAA also agrees that the text as written incorrectly implies that light-sport category aircraft are type-certificated. Accordingly, the final rule omits the parenthetical phrase, "other than primary category or light-sport category" in the revision to § 21.185(b)(2)(ii).

NAVAIR submitted several comments concerning § 21.185. NAVAIR recommended in § 21.185(b)(2)(i) replacing the term "U.S Armed Forces," clarification of the phrase "accepted for use by," and clarification of the requirement that the "aircraft is of a type that has a service history with the U.S. Armed Forces acceptable to FAA." NAVAIR submitted, and FAA addressed, these same comments in section IV.M.1 concerning issuance of restricted category type certificates. Those dispositions apply to § 21.185.

This final rule amends this section to make such changes as are necessary to advance the intent of the rule.

3. Issuance of Multiple Airworthiness Certificates for Restricted Category Aircraft (§ 21.187)

This rule revises the heading of § 21.187 by adding "for restricted category aircraft" to clarify this section applies only to restricted category aircraft. One commenter requested clarification on whether FAA issues experimental airworthiness certificates under this section. In response, FAA notes that § 21.187 sets forth requirements for an applicant for an airworthiness certificate in the restricted category and another category. From the establishment of the restricted category in 1950, FAA policy has limited the issuance of airworthiness certificates under this section to categories as defined via type

certification.[320] That is, for the purposes of this section, FAA does not view experimental aircraft as a category since an experimental aircraft has not been found to conform to a type certificate. Accordingly, longstanding FAA policy excludes the issuance of experimental airworthiness certificates under § 21.187.

N. Noise Certification of Aircraft that Do Not Conform to a Type Certificate

In a change from the NPRM, the final rule does not require noise certification of aircraft that do not conform to a type certificate. This is consistent with the Administrator's discretionary authority to prescribe "as he deems necessary … regulations to control and abate aircraft noise," 49 U.S.C. 44715, and it conforms to executive branch policy of being "prudent and financially responsible in the expenditure of funds, from both public and private sources, and to alleviate unnecessary regulatory burdens placed on the American people," E.O. 14192 (January 31, 2025). When exercising that discretionary authority, 49 U.S.C. 44715 requires the Administrator to consider several factors, including relevant information about noise, economic reasonableness, and appropriateness for the applicable aircraft. Considering LSA, despite broad growth in the sector, remain a small portion of the GA fleet, as well as the comments received and data at his disposal, the Administrator has declined at this time to exercise this authority to require noise certification of aircraft that do not conform to a type certificate.

The final rule amends part 36 to provide a voluntary means for aircraft owners and manufacturers of aircraft that do not conform to a type certificate to demonstrate compliance with part 36 noise levels for their aircraft. This rule permits the use of industry consensus standards as a means of compliance with part 36 for the first time and permits the use of a statement of compliance (SOC) as a method of showing compliance.

This rule does not create new noise limits, nor does it apply to aircraft that conform to a type certificate.

By providing a voluntary means of compliance, FAA allows those who wish to comply to utilize flexible, cost-effective procedures, requiring far fewer resources than traditional part 36 noise testing for type-certificated aircraft. FAA also intends to gather data on the effectiveness of a voluntary approach to compliance with part 36 for non-type-certificated aircraft, as well as provide a means for those who wish to demonstrate compliance for their own purposes, such as preparing aircraft for international export or showing efforts to be a good neighbor to noise-sensitive communities, to do so.

1. Authority to Regulate Aircraft Noise

The Administrator has authority to prescribe noise standards and regulation "as he deems necessary… to control and abate aircraft noise and sonic boom" under 49 U.S.C. 44715. Through this provision, Congress provided broad discretionary authority for the Administrator to prescribe noise regulations for any aircraft. In 1968, with the addition of 49 U.S.C. 44715(a)(3), Congress mandated noise testing when the agency issues type certificates. In addition to consultation with appropriate Federal agencies and State authorities, 49 U.S.C. 44715(b) directs the Administrator to consider four items when prescribing noise regulation: 1) relevant information related to aircraft noise, 2) whether the standard or regulation is consistent with the highest degree of safety in air transportation or air commerce in the public interest, 3) whether the standard or regulation is economically reasonable, technologically practicable, and appropriate for the applicable aircraft, aircraft engine, appliance, or certificate, and 4) the extent to which the standard or regulation will carry out the purposes of the section. Through these provisions Congress directed the Administrator to regulate aircraft noise for type

certificated aircraft, which he did through the promulgation of part 36, and gave the Administrator broad authority to regulate aircraft noise "as he deems necessary" for aircraft not conforming to a type certificate.

2. Noise Certification Background

The primary means of controlling aircraft noise for type certificated aircraft is assessing noise at its source, the aircraft itself, against the noise limits in part 36 during the type certification process. This process uses measurement procedures and methods that are relevant to day-to-day operations to ensure designs meet the noise limits. Noise limits are set based on weight, design, and means of propulsion. Measurement procedures are based on leading scientific practices for noise measurement. Part 36 has noise limits and measurement procedures for fixed wing small airplanes, jets, helicopters, and tiltrotor aircraft. Historically, as new aircraft types develop, FAA gathers the appropriate data to determine the acceptable level of noise and proper measurement procedures. If the aircraft is sufficiently new and novel that it does not fit into an existing category, FAA can develop an ad-hoc noise certification basis for that specific aircraft with specific means and methods of compliance.

3. Means and Methods of Compliance[321]

There are four means of compliance contemplated under this rule. The use of industry consensus standards, the conventional means of compliance available in part 36 for type certificated aircraft, the use of a means of compliance developed for a same or sufficiently similar type-certificated aircraft, or the development of an ad-hoc noise compliance basis. Industry consensus standards for noise would be developed by a consensus standards body and contain means and methods of compliance approved by FAA. This consensus standards-based approach would provide industry with

unprecedented flexibility to develop lower cost ways to demonstrate compliance than the noise testing required for type certificated aircraft. For example, consensus standards may allow the use of prediction models as a method of compliance rather than require the extensive testing that is necessary for type certificated aircraft. FAA anticipates that most persons who choose to comply with part 36 will demonstrate compliance with this rule through adherence to consensus standards when these standards are completed and approved by FAA.

Conventional standards for type certificated aircraft in part 36 also serve as an option if a person seeking to comply so chooses or no consensus standard exists. If conventional standards for part 36 are utilized to demonstrate compliance, the aircraft must fit into one of the categories in part 36 (fixed wing small airplane, transport category large airplane, jet, helicopter, or tiltrotor). If FAA has determined, for noise purposes, that an aircraft is the same or sufficiently similar to a type certificated aircraft, compliance can be demonstrated by using the same testing requirements and noise levels of that type-certificated aircraft. If FAA finds that an aircraft is sufficiently new and novel that it does not fit into a part 36 category, the agency can create an ad-hoc noise compliance basis by modifying the certification basis of an aircraft that is type certificated or utilize some combination of part 36 and other standards. This could involve using parts of current regulations in part 36, regulations in part 36 that are no longer used for new certifications, accepted noise compliance standards that are not published in part 36 (such as those applicable to a single aircraft model), and portions of FAA-approved noise consensus standards. This provision, § 36.0(d)(2), which the final rule renumbers to § 36.0(b)(3)(ii), is intended to allow the agency maximum flexibility to find an appropriate combination of requirements.

Persons who choose to seek compliance with part 36 for their aircraft will need to show that they meet the noise limits of that part and submit an SOC to FAA to state they are in compliance. A person who submits such an SOC to FAA may share that SOC with other interested stakeholders. Manufacturers of light-sport category aircraft may use FAA Form 8130-15 for this SOC.

By providing a variety of options, FAA hopes to incentivize voluntary compliance with part 36 by minimizing the cost of compliance for those who wish to do so.

4. Summary of Changes Between the NPRM and the Final Rule

FAA has made the following modifications and clarifications to the final rule.

a. Compliance with Part 36 Noise Limits Voluntary for Non-Type-Certificated Aircraft

The NPRM proposed expanding part 36 applicability to non-type certificated aircraft "at application for a first airworthiness certificate, or when an aircraft previously issued an airworthiness certificate incorporates an alteration that would result in an acoustic change."[322]

As previously discussed, the Administrator has the authority to regulate aircraft noise for non-type certificated aircraft at his discretion. The statute that grants him this authority, 49 U.S.C. 44715, also requires him to consider "relevant information related to aircraft noise," and whether a potential "standard or regulation is economically reasonable, technologically practicable, and appropriate for the applicable aircraft." In addition, while FAA anticipated in the NPRM that most aircraft owners and manufacturers would utilize consensus standards to demonstrate compliance with part 36, these standards are not yet developed or approved by FAA. Given this is the first time a consensus standards-based approach is being taken toward demonstration of noise compliance, the risk of not having standards in place prior to the effective date of this

rule is elevated. The preliminary Regulatory Impact Analysis for this rule concluded that if these standards were not in place, it could cost up to $20,000 per aircraft per model for compliance that would impose a significant cost on aircraft owners and manufacturers.

On January 31, 2025, President Trump signed E.O. 14192 "Unleashing Prosperity Through Deregulation." In this order, the President declared it the policy of the Executive Branch to "…be prudent and financially responsible in the expenditure of funds, from both public and private sources, and to alleviate unnecessary regulatory burdens placed on the American people."

Considering the potential for additional cost burden on the public and administration policy regarding reducing regulatory burden, the Administrator cannot justify mandatory regulation of LSA noise at this time.

Therefore, consistent with the requirements in 49 U.S.C. 44715 and executive branch policy outlined in E.O. 14192, the Administrator has chosen not to impose compliance with part 36 for aircraft not conforming to a type certificate. FAA remains committed to reducing public exposure to aircraft noise where appropriate and anticipates using data gathered from voluntary compliance with part 36 under this final rule to evaluate the effectiveness of this voluntary approach, as well as the use of consensus standards for non-type certificated aircraft to demonstrate compliance with part 36. The Administrator reserves the right to promulgate future regulation under the authority of 49 U.S.C. 44715 if necessary. FAA believes this approach minimizes the burden on those seeking airworthiness certification while still providing a means to comply for those who may want to demonstrate compliance with part 36. Meanwhile, this approach eliminates the potential burden on the public if consensus standards are not in place by the effective date of this rule and maintains compliance with E.O. 14192's requirement to limit

regulatory burden. In addition, FAA will be able to gather data on the effectiveness of voluntary consensus standards for aircraft not conforming to a type certificate to demonstrate noise compliance.

Under this rule, altering an aircraft in a manner that increases aircraft noise would invalidate a previously issued SOC, and noise compliance would need to be reevaluated if a person wishes to show or state compliance with part 36 for the altered aircraft.

b. Removal of Noise Provisions from §§ 91.319(l) and 91.327(b)(4)

The NPRM proposed to apply 14 CFR part 36 noise requirements to some light-sport category aircraft and, accordingly, proposed to amend §§ 91.327(b)(4) and 91.319(l) to prohibit a person from operating an aircraft issued an experimental airworthiness certificate under § 21.191(i) or (j), or a special airworthiness certificate in the light-sport category, respectively, unless the aircraft demonstrated compliance with the applicable requirements of part 36.

Commenters, including Hartzell Propeller, expressed concern with placing responsibility on pilots for knowing whether their aircraft complied with part 36. Specifically, Hartzell Propeller stated the proposed amendments may pose an issue for pilots, because there would be no statement in flight manuals, logbooks, or similar documents indicating whether part 36 is applicable to a particular aircraft and, if so, whether the requirements of part 36 have been met. Hartzell Propeller questioned whether it should be the pilot's responsibility to determine the applicability of part 36 to a given aircraft and stated the noise provisions should not be enforced at the pilot operating level.

FAA agrees that placing the responsibility on the pilot as stated in the NPRM would not have been appropriate, and responsibility would have better been placed on the

aircraft owner. However, in removing the requirement for mandatory compliance with part 36 for alterations of light-sport category and experimental light-sport kit-built aircraft, the proposed operating limitations in §§ 91.327(b)(4) and 91.319(l) are no longer relevant and are removed in this final rule. Any persons seeking to voluntarily comply with part 36 under this rule must submit a statement of compliance to FAA per § 36.0.

c. Agriculture and Firefighting Aircraft Remain Exempt From Part 36

FAA requested comment on whether any other categories of aircraft should or should not be subject to part 36 noise requirements. NAAA and GAMA expressed concern that agricultural and firefighting aircraft not conforming to a type certificate would be required to comply with part 36 under this rule.

In removing the requirement for mandatory compliance with part 36 for all non-type-certificated aircraft, exempting non-type-certificated aircraft that have been designated exclusively for agricultural or firefighting aircraft operations is unnecessary. Persons seeking to voluntarily comply with part 36, including for aircraft designated for agricultural or firefighting aircraft operations, may opt to demonstrate compliance with part 36 under this rule.

d. Modification of the Factors for Evaluating Noise Consensus Standards

In the preamble to the NPRM, FAA articulated a set of factors that it anticipated using to evaluate noise consensus standards. Many commenters argued that these factors were too strict and impractical to follow. In response, FAA has modified these factors. Specifically, the factor that "The noise levels generated from using the standard must be within 90 percent of confidence limits and must be within +/-2 decibels A (dBA) when compared to results from using the full noise measurement procedures in the corresponding appendix of part 36" has been modified to "within +/-3dB," and the 90

percent confidence limits requirement has been removed. These changes simplify the criteria and make it easier to balance the rigor of the methods with ease of use.

In addition, FAA made a minor modification in a factor for clarification. The factor "The standard must consider developments in other associated fields (such as research programs into quantification and control of aircraft noise) and participation by stakeholders" was modified to add "in the development of the standard" following "stakeholders" to clarify that FAA expects to consider the degree to which stakeholders participated in the standard development process.

The remaining factors remain unchanged as they were outlined in the NPRM. FAA, therefore, now expects to consider the following four factors when evaluating new noise consensus standards to evaluate compliance:

(1) The methods in the standard, whether based in physical noise testing or through validated and/or generally accepted noise prediction methods, must be environmentally responsible, economically reasonable, technologically practicable, and appropriate for the aircraft to which it would apply;

(2) The standard must consider developments in other associated fields (such as research programs into quantification and control of aircraft noise) and participation by stakeholders in the development of the standard;

(3) The noise levels generated from using the standard must be within +/−3 decibels A (dBA) when compared to results from using the full noise measurement procedures in the corresponding appendix of part 36; and

(4) The standard must clearly document all assumptions used in the development, validation, results, and limitations of the methods presented.

e. Technical Corrections

FAA made several revisions to part 36 to conform to the changes discussed in this preamble. Section § 36.0 has been retitled to "Applicability and statements of compliance for aircraft that do not conform to a type certificate." to reflect the nature of the section. Throughout § 36.0 regulatory text has been modified to reflect that "persons" may voluntarily seek to demonstrate part 36 compliance, rather than reflecting "applicants" are required to apply for noise certification as proposed in the NPRM. In addition, the entirety of § 36.0 has been reorganized for clarity. The citations below reflect the location of the relevant text in the final rule.

Section 36.0(a) has been modified to reflect that the section applies to persons seeking to show compliance with noise standards for aircraft not conforming to a type certificate described in §§ 21.190, 21.191(k), or 21.191(l), of this chapter. The NPRM proposed including all aircraft certificated under § 21.191. This change clarifies that § 36.0 is only applicable to experimental aircraft that are operating light-sport category kit-built aircraft (§ 21.191(k)) and operating former light-sport category aircraft (§ 21.191(l)). In addition, the final rule omits § 21.193(h) and part 22 from § 36.0(a) as redundant as §§ 21.190, 21.191(k), and 21.191(l) are sufficient to cover the aircraft intended by this rule.

Section 36.0(b)(1) and (b)(3) have been modified to reference aircraft described under § 36.0(a) rather than aircraft that do not conform to a type certificate to more accurately reference the aircraft these provisions apply to.

Section 36.0(b)(1)(ii) has been modified to remove "and applicable to the aircraft's specific design" as FAA determining the appropriateness for the aircraft includes determining if the consensus standard is appropriate for the "aircraft's specific design."

Section 36.0(b)(3)(i)(A) has been modified to clarify that a person seeking to demonstrate compliance with part 36 for an aircraft for which § 36.0(a) applies may use the same testing requirements as a type-certificated aircraft if FAA determines for noise purposes the two aircraft are substantially similar.

Section 36.0(b)(3)(i)(B) has been modified to remove "to the aircraft when the aircraft has not been altered to result in an acoustical change." This reflects that when an aircraft is type certificated, it includes compliance with part 36. Therefore, this text is unnecessary. Section 36.0(b)(3)(i)(B) has also been modified to clarify that FAA is determining for noise purposes whether the type-certificated aircraft is the same or sufficiently similar in design.

Section 36.0(b)(3)(ii) has been modified to replace the word "an applicant" with "a person" as the entity that can seek noise compliance for conformity with the remainder of § 36.0.

FAA has also split § 36.1501(a) into two sub-paragraphs, § 36.1501(a)(1) and (2), to differentiate between aircraft with and without type certificates. These modifications do not change the substance of this requirement for aircraft with type certificates. For aircraft without type certificates, given compliance with part 36 is now voluntary, the final rule in § 36.1501(a)(2) revises the NPRM proposed requirement to include noise levels in the POH to instead require that all procedures, weights, configurations, and other information or data employed for obtaining noise levels, including equivalent procedures used for flight testing and analysis must be provided by the applicant to FAA. This change was made to maintain consistency with the SOC requirements.

This final rule relocates the substance of proposed § 36.1581(h)(1), (2), and (3) to § 36.0(c)(1)(i), (ii), and (iii), respectively. Section 36.0(c)(1)(i) has been modified to add

"the applicable provisions of" to narrow the SOC to the applicable provisions of part 36. Section 36.0(c)(1)(ii) has been modified to add ", and procedures, aircraft configurations, aircraft weights, and other information employed for obtaining the noise levels" to maintain consistence with the SOC requirements. Section 36.0(c)(1)(iii) has been revised to add "or unacceptable" to match the statement currently required in § 36.1581(c). This language was inadvertently omitted from the NPRM proposal. The remainder of proposed § 36.1581(h) is removed completely as voluntary noise compliance is documented by an SOC and is not as specified in §§ 21.190(d) or 21.191.

5. Discussion of Comments

a. Suitability of Noise Limits to Light-Sport Category Aircraft

Industry commenters including GAMA, Van's Aircraft, and Hartzell Propeller, as well as some individuals, expressed concern about or opposed adding noise requirements to light-sport category aircraft.

The commenters stated light-sport category aircraft are limited in size and already have a reduced noise profile. In addition, Van's Aircraft and Hartzell Propeller stated they reviewed EASA and FAA noise databases and stated light-sport category aircraft fall well below the maximum noise level limits. Van's Aircraft also commented that most of its light-sport category aircraft would easily meet existing noise requirements; specifically, stating the company's RV models built in Europe must demonstrate noise compliance for EASA certification. Van's Aircraft also stated noise certification requirements could lead to a detrimental decrease in safety-enhancing aircraft performance.

FAA disagrees with the claim that the NPRM would have required design changes, compromises, or performance reductions that could negatively impact safety.

Since multiple industry commenters have stated most light-sport category aircraft are already quiet and likely meet the noise requirements, there would have been minimal need for design changes. In addition, Van's Aircraft stated in its comments that its aircraft are already required to comply with EASA's noise certification requirements, which are more stringent than those proposed under the NPRM. Even if design changes would have been necessary to meet proposed noise requirements of the NPRM, aircraft would have still needed to meet airworthiness requirements that ensure the aircraft is safe for flight.

As previously stated, the Administrator has chosen not to mandate part 36 for aircraft not conforming to a type certificate. This change was made, in part, due to feedback from individuals, manufacturers, and associations on the proposal to mandate noise requirements.

As stated previously, this final rule retains requirements and procedures applicable to certain non-type-certificated aircraft should a person or manufacturer choose to demonstrate compliance with part 36. Specifically, this final rule revises proposed § 36.0 to (1) state this provision applies to light-sport category aircraft and light-sport category kit-built aircraft that do not conform to a type certificate, (2) clarify the voluntary provision for a person to comply with part 36 and to document that compliance with an SOC, (3) relocate the information for documenting compliance to this section from § 36.1581(h), and (4) delete paragraph (e) since listing exceptions is no longer applicable for a voluntary provision.

The United States Ultralight Association (USUA) recommended that FAA remove noise requirements from the final rule. USUA argued the justification for the noise requirements was a "'just in case' argument" and sought to remind FAA that "if a

problem manifests itself with 'obsolete, overly loud technology' being introduced into the fleet that the agency will still have the ability to create regulations and policies to address real problems." Comment from United States Ultralight Association (USUA), FAA-2023-1377-1302 (quoting from the NPRM).

FAA acknowledged in the NPRM there are existing noise concerns, and these concerns along with the potential growth of LSA aircraft led the agency to propose regulation of noise to limit the future adverse impact of LSA noise. Following review of public comments and assessing the potential costs of noise compliance, along with the fact that current policy of the United States is to avoid regulatory burden wherever possible, FAA is proceeding with a voluntary program for those who wish to comply. As USUA suggests, this data-gathering will help FAA regulate noise from non-type-certificated aircraft if the Administrator deems it necessary at a future date.

Hartzell Propeller stated FAA did not provide any rationale for the expected cost of compliance with part 36. It asserted FAA should prepare more details, including timelines and the potential opportunity cost of lost sales, for several different project scenarios, as well as including the costs use of professional services such as Designated Engineering Representatives (DERs). Van's aircraft expressed concern about the backlog of testing that could occur if LSA were required to be tested to certify part 36 compliance as well as the high costs if testing were required.

In the preliminary Regulatory Impact Analysis (RIA) for this rule, FAA provided a lower bound cost estimate based on the use of industry consensus standards that may rely on prediction methods as a means of compliance. In the case of the prediction-based approach, the cost of estimating aircraft noise levels was anticipated to be de minimis. The preliminary RIA also included an upper bound estimate using noise type certification

testing for an average of $20,000 per LSA model. This upper-bound estimate considers flight testing and the use of a professional service such as acoustic DER. See the preliminary RIA on the docket for more information. While FAA anticipates most persons seeking voluntary compliance to part 36 to utilize the prediction-based approach based on consensus standards, the upper bound cost estimate serves as a "worst case scenario" based on established data and methods. Because consensus standards are not yet in place, the agency considered this "worst case scenario" when assessing potential burden on the public to avoid underestimating the impact.

Because the mandatory noise certification had the potential to add costs and burden to the public, and given the administration policy regarding reducing regulatory burden, FAA decided the potential noise mitigation did not justify the cost of mandatory noise certification of aircraft not conforming to a type certificate.

b. Suitability of Applying Noise Limits to Some Experimental Aircraft

GAMA, EAA, and some individual and industry commenters expressed concerns with applying noise requirements to some experimental aircraft and stated it would burden individual aircraft owners without clear benefits. Commenters also said the new noise requirements may stifle experimentation, especially for EAB aircraft.

As compliance with part 36 for aircraft without type certificates under this rule is now voluntary, individual aircraft owners and manufacturers are free to make whatever decisions they deem appropriate, within the boundaries of 14 CFR. FAA notes, however, that Congress granted it statutory authority and responsibility to regulate aircraft noise to protect the public health and welfare. As illustrated by FAA's regular noise reviews and noise-based litigation, this is an issue that greatly animates the public. FAA does not agree, as some commentors insinuated, that noise certification lacks value entirely.

c. Suitability of Applying Consensus Standards to Powered-Lift Aircraft

EASA had concerns about the suitability of noise consensus standards for powered-lift aircraft, because there is limited noise measurement data available for them. Hartzell Propeller commented that some novel aircraft designs are yet to be well defined and are not covered by the aircraft categories shown in part 36, so applying noise requirements to those aircraft would be detrimental to the industry.

FAA agrees with EASA and anticipates that development of consensus noise standards would focus on aircraft that already have sufficient noise data available. FAA notes this rule does not create new noise limits but rather uses the noise limits already included in part 36.

Further, FAA works with other regulatory authorities and industry and has been actively engaged in the International Civil Aviation Organization Committee of Aviation Environmental Protection Working Group 1 (ICAO CAEP WG1) to develop future noise standards for powered lift aircraft.

For novel aircraft, including some powered lift aircraft, voluntary noise compliance could be demonstrated through proposed § 36.0(d)(2), which the final rule renumbers to § 36.0(b)(3)(ii), even when there are no industry consensus standards and an aircraft does not fit into an existing part 36 category. This approach was adopted to provide flexibility to persons who choose to seek part 36 noise certification.

d. Use of Consensus Standards

Industry associations and individual commenters generally supported the use of industry consensus standards in noise certification of light-sport category aircraft but expressed concern about the resources required to develop the standards and the technical challenge in developing consensus standards. Several commenters including Hartzell

Propeller, GAMA, EASA, EAA, and individuals wondered why FAA would "approve" noise consensus standards while FAA "accepts" safety-based airworthiness standards.

Hartzell Propeller cited challenges in developing industry consensus standards, such as balancing technical rigor with ease of use, considering that manufacturers or owners of aircraft may not have experience in noise certification. It also cited the need for accessing FAA's aircraft noise data to support standard development. In addition, Hartzell Propeller expressed concern about whether the noise consensus standards would be available in time for the effective date of the rule and if the standards would be able to cover all the aircraft design types covered by this rule.

EASA indicated a need to maintain a sufficient level of regulatory oversight in terms of approval of the consensus standards and methods used in demonstrating compliance, citing the need for harmonization between the two regulatory bodies. EASA stated it currently applies the same noise requirements to light-sport category aircraft as it does to type certificated aircraft, that is, noise flight testing to demonstrate compliance.

EASA and Hartzell Propeller sought clarification about the criteria used in validating industry consensus standards. Hartzell Propeller indicated +/-2 decibels might be too narrow a range for prediction-based methods.

FAA is requiring approval of noise consensus standards in this rule because the use of consensus standards for noise certification is new for both government and industry, and it believes approval is necessary to ensure the process accomplishes the intended goals. FAA's approval process of noise consensus standards for aircraft not conforming to a type certificate is similar to FAA's approval process for equivalent noise testing procedures used for type-certificated aircraft. The factors that describe how FAA will evaluate these consensus standards are given above, in section IV.N.5.d, and those

factors have been broadened beyond +/-2 decibels. Utilizing a proven process is important for both supporting industry and working with international partners.

FAA agrees with the commenters that there is no guarantee that consensus standards will be complete by the effective date of this rule. The agency is willing to support consensus standard development by sharing noise data and by providing input to standard development organizations on an "as-needed" basis and will do so consistent with the requirements and procedures found in OMB Circular No. A-119. FAA expects industry will take a leading role in the development of noise consensus standards, as it has with airworthiness standards.

FAA acknowledges the Hartzell Propeller comment regarding balancing technical rigor with ease of use and can provide input on specific topics on an as-needed basis. FAA expects standard-setting committees to balance this to the best of their knowledge and engineering judgement. In evaluating noise consensus standards for approval, FAA will focus on the factors described in section IV.N.5.d of this rule.

FAA already works with EASA and other authorities to harmonize the practices used in noise certification for type certificated aircraft and expects to do the same for non-type certificated aircraft going forward.

FAA also notes that if an aircraft not conforming to a type certificate is of the same design as an aircraft that has already received noise certification from EASA in accordance with ICAO Annex 16 Volume 1, the manufacturer can use the noise data from its EASA certification to demonstrate compliance with the voluntary noise requirements of this rule.

e. Demonstration of Compliance

Industry commenters including GAMA, Hartzell Propeller, EAA, and many individuals sought clarification about the level of oversight FAA will require to demonstrate compliance. They expressed concerns that if the level of oversight required would be similar to that of noise certification of type certificated aircraft, it would delay projects and cause resource constraints for both FAA and the industry. Many suggested the use of a self-declaration process to show compliance with part 36. GAMA commented that § 36.1581(h) is not necessary for special light-sport category aircraft (S-LSA) because if noise compliance is required, it may be enforced elsewhere rather than at the pilot operating level. Hartzell Propeller further commented that requiring an airworthiness change for an experimental light-sport category aircraft (E-LSA) from one experimental category to a different experimental category for the purposes of testing a modification accomplishes little.

As discussed earlier in this preamble, FAA has provided several means of compliance that the agency believes provides a flexible approach to demonstrate compliance with part 36. Through use of a voluntary approach, FAA can gather information on the effectiveness of voluntary compliance with part 36 for non-type certificated aircraft. The statement of compliance process utilized by this rule is self-declarative in nature and will not require the level of FAA oversight required for type certification projects.

Since this final rule makes compliance with part 36 voluntary for non-type-certificated aircraft, this final rule also removes from part 21 corresponding requirements for an SOC to part 36. Similarly, this final rule deletes from the last sentence of proposed § 36.1501(a), "noise levels achieved during airworthiness certification must be included in the Pilot's Operating Handbook," and deletes the second sentence of proposed

§ 36.1851(h), "Noise compliance with this part must be documented as specified in § 21.190(ed) or 21.191 of this chapter, as applicable." This final rule relocates the substance of proposed § 36.1581(h)(1), (2), and (3) to § 36.0(c)(1). As stated earlier in this preamble, manufacturers and persons seeking voluntary compliance with part 36 may display the SOC in a manner of their choosing.

f. Other Comments on Certification Processes and Standards

EASA and Hartzell Propeller had questions and concerns related to the applicability of part 36 appendix F to noise certification under this rule. EASA sought clarification as to whether the use of appendix F would be exclusively for compliance demonstration. EASA, Hartzell Propeller, and individuals also commented that the requirements for testing in appendix F are not necessarily simpler than appendix G, as asserted in the NPRM.

FAA notes that use of appendix F was offered as an example of a method that could serve as the basis of a consensus noise standard, not necessarily a means or method of compliance that should be undertaken for noise certification. This example was offered because appendix F uses an A-weighted maximum noise level (Lamax) while appendix G requires measurement of sound exposure level (SEL). If a prediction model is to be used for propeller driven aircraft, it is generally easier to predict Lamax than SEL. This final rule does not require appendix F flight testing procedures or correction of noise levels from appendix F to appendix G.

Hartzell Propeller commented that the noise requirements for propeller-driven aircraft in part 36 create a "tilted playing field" with respect to aircraft age and weight, and the noise limit curve penalizes newer and lighter aircraft, discouraging aircraft turnover. Van's Aircraft also questioned the reason for the weight-based approach to

noise classification. FAA notes the noise limits in part 36 are identical to the globally recognized ICAO standards and are based on extensive collaboration and coordination among aviation authorities of ICAO member states and industry representatives worldwide. ICAO recognizes that larger, heavier aircraft yield greater utility and thus should be allowed to generate more noise. This concept serves as the basis for these standards.

Hartzell Propeller suggested that FAA continue to issue airworthiness certificates to LSA based on designs in production prior to the effective date, even if those newly constructed aircraft do not comply with part 36.

On or after [INSERT DATE 365 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER], FAA will only issue an airworthiness certificate for a light-sport category aircraft if the applicant meets the requirements of this final rule. See related discussion in sections IV.L.2.e and IV.Q. As previously discussed throughout section IV.N, this final rule does not require compliance with part 36 for non-type-certificated aircraft.

g. Community Noise Concerns

FAA received 13 comments on the MOSAIC NPRM from community groups and individuals expressing concern about the impacts of noise from expanded MOSAIC provisions.

AICA stated noise impacts of the NPRM are difficult to determine by impacted communities, insufficient information was shared by FAA, and the rule will result in increased levels of high-performance aircraft. It also stated part 36 noise limits referenced in the rule are difficult for communities to understand, let alone evaluate.

Several individuals who commented expressed concerns, stating that FAA has failed to address worsening aircraft noise, particularly from general aviation, as well as the impact of noise on public health, environmental quality, and community welfare. Commenters stated they believed the MOSAIC rule could potentially exacerbate these issues by introducing more aircraft and pilots without adequately balancing the resulting noise and environmental effects. In addition, commenters referenced FAA's recent Noise Policy Review (NPR), which received thousands of submissions documenting noise impacts from general aviation. Commenters urged FAA to prioritize compliance with its obligations under 49 U.S.C. 44715 to protect public health and welfare from aircraft noise before advancing the MOSAIC rule.[323]

FAA recognizes that aircraft noise is a concern for many stakeholders. The agency's Neighborhood Environmental Survey (NES) and ongoing NPR reflect FAA's ongoing commitment to understand aircraft noise across all aircraft. As discussed earlier, under 49 U.S.C. 44715, the Administrator has full discretionary authority over when to prescribe regulations to control and abate aircraft noise for non type-certificated aircraft. Among the considerations when exercising this authority are relevant information related to aircraft noise, consistency with the highest degree of safety in air transportation or air commerce in the public interest, and economic reasonableness. In addition, under E.O. 14192, it is the policy of the executive branch to "alleviate unnecessary regulatory burdens placed on the American people." After giving due consideration to the factors outlined in 49 U.S.C. 44715, and consistent with current executive branch policy under E.O. 14192, the Administrator has decided not to exercise his authority at this time.

The Programmatic Environmental Assessment (PEA) discloses the potential environmental impacts associated with this rule and its implementation, including noise

impacts. A draft PEA for this rule based on policy in the NPRM was issued on May 27, 2025, for public comment. A final PEA based on policy included in this final rule is described in section V.G and is available on this rule's docket. In general, both PEAs and the associated noise technical studies demonstrate this final rule would not result in significant adverse noise impacts. Please refer to the final PEA for further information on noise impacts.

FAA believes that by establishing a process for non-type certificated aircraft to voluntarily demonstrate compliance with part 36, the agency has provided an option for those who wish to do so, while also providing a method to determine the effectiveness of voluntary standards for aircraft not conforming to a type certificate. This voluntary program may also provide useful data should future policy changes be necessary.

h. General Comments

GAMA, VAI, EAA, AOPA, NATA, NBAA, and many individuals commented on the following sentences in the NPRM: "In the past two decades, the reality of the number of aircraft operating that do not conform to a type certificate has overtaken those historical presumptions. There are now tens of thousands of aircraft that do not conform to type certificates, many of them nearly identical."

Commenters disputed this, saying that while many experimental aircraft may indeed appear "nearly identical," engines, propellers, and exhaust systems vary widely even among similar airframes.

FAA intended to describe models of aircraft not conforming to a type certificate that are similar to specific type certificated general aviation aircraft. The agency acknowledges there are similar models and airframes with significantly different noise profiles due to variations among engines, propellers, exhaust, and other systems.

Hartzell Propeller expressed concern that the proposed part 36 requirements would apply to existing aircraft types for which there are no FAA defined or accepted procedures or limits for noise compliance in part 36; namely gyroplanes, weight shift control vehicles, and powered parachutes. Hartzell Propeller further stated the industry cannot define a consensus standard for these vehicles for the same reason.

FAA reiterates that balloons, gyroplanes, weight shift control vehicles, and powered parachutes, which have no or limited noise sources and do not readily fit into categories with noise measurement standards defined in part 36 appendices, were excepted from the requirement to demonstrate compliance with part 36 under § 36.0(e)(2) in the NPRM. Regardless, under this final rule, compliance with part 36 is voluntary for all light-sport category aircraft and light-sport category kit-built aircraft that are not type-certificated.

Hartzell Propeller questioned the organization of the noise requirements added to multiple sections of the CFR, i.e. in parts 21, 22, 36 and 91, and suggested consolidation of those references. Further, the commenter argued that the manner in which part 36 compliance was applied to all experimental categories and then exempted all but light sport was problematic, because it could possibly imply some future rulemaking.

As discussed previously, under this final rule compliance with part 36 is voluntary for all light-sport category aircraft and light-sport category kit-built aircraft that do not conform to a type-certificate. As such, corresponding requirements in parts 21, 22, and 91 no longer apply and are removed.

O. Import and Export of Aircraft

The NPRM proposed to amend § 21.183(d)(2) to enable acceptance of an inspection performed by a foreign maintenance organization to support imports of used

aircraft from countries with which the U.S. has a bilateral agreement that includes acceptance of imported aircraft. That proposal was intended to align regulatory text with the intent expressed in the preamble when § 21.183(d)(2) was last amended. No comments were submitted to the docket concerning this proposal. This final rule adopts this section as proposed.

The NPRM proposed revising § 21.327 to require that an applicant for an export certificate of airworthiness for an aircraft be an owner of that aircraft and the aircraft must be registered in the U.S. This proposal would preclude persons from exporting aircraft for which they are neither the owner nor the owner's agent. Furthermore, by requiring the aircraft to be registered in the U.S., this proposal would allow the aircraft to be under the regulatory authority of the U.S. before export. FAA received two comments related to this proposal.

One commenter asked if an owner's agent would be able to apply for an export certificate of airworthiness for an aircraft. As discussed in the preamble of the NPRM, an owner's agent would be able to sign and submit this application. The final rule amends this section to add, "(or the agent of the owner)" for clarity.

Another commenter stated an amendment concerning importing or exporting aircraft should be addressed in separate rulemaking. FAA has full latitude for managing its rulemaking activities, including whether to bundle proposals within one rulemaking action or address such proposals in separate rulemaking actions. The NPRM was a combination of many different proposals related to special airworthiness certification, and this change concerning exports was well within the scope of these proposals, especially for export of type-certificated aircraft that are issued special airworthiness certificates. Also, FAA notes that the table of contents on the cover page of the NPRM

showed a section of the NPRM for amendments concerning import and export of aircraft, clearly indicating inclusion of this subject matter on the first page of the NPRM. Accordingly, given that FAA acted rationally and within its authority for combining proposals within a given rulemaking action, FAA disagrees with the commenter that this matter should be addressed in separate rulemaking.

This final rule adopts § 21.327 as proposed, except for the addition regarding agents discussed above.

The NPRM proposed revising § 21.329(a)(1) requirements for the issuance of an export certificate of airworthiness to remove the word "airworthiness," clarifying that a new or used aircraft manufactured under subpart F or G of the part would need to meet all applicable requirements under subpart H of the part—not just those requirements that may apply to airworthiness. Subpart H contains requirements for items other than airworthiness, such as requirements for aircraft registration and identification. No comments were submitted to the docket concerning this proposal. This final rule adopts this section as proposed.

P. Other Out of Scope Comments

MFTC and GAMA commented that this NPRM only covers FAA-issued experimental flight permits and requested that this NPRM apply to FAA-issued special flight authorizations (SFA) also. MFTC noted Bombardier's flight test vehicles are Canadian-built and registered and have TCCA experimental flight permits with FAA SFAs and operate in the U.S. (i.e. Bombardier at Wichita Airport).

FAA did not address SFAs in the NPRM and there were no proposed changes to SFA-related regulations in the NPRM. In addition, it is unclear specifically what parts of the NPRM are being requested apply to SFAs and what the rationales or justifications

would be for expanding applicability to SFAs for each part, as none is offered in the comment. As such, FAA disagrees with this recommendation for this final rule as it lacks sufficient clarity to appropriately consider the recommendation, and it may be a substantive change that exceeds the scope of this rulemaking. Such a proposal would likely require appropriate notice to the public and opportunity for comment.

One commenter stated the MOSAIC proposal does not address the kit aircraft community under the current "fifty-one percent" rule under § 21.191(g). The commenter recommended either eliminating the "fifty-one percent" rule or modifying the "fifty-one percent" rule to remove "substantially." FAA notes the "fifty-one percent" rule is a common reference to the requirements to obtain an experimental airworthiness certificate for the purpose of operating amateur-built aircraft. Specifically, § 21.191(g) requires that the major portion of the aircraft has been fabricated and assembled by persons who undertook the construction project solely for their own education or recreation. As noted in the comment, the NPRM did not address kit aircraft in terms of the "fifty-one percent" rule. FAA disagrees with this recommendation as it is outside the scope of this rulemaking. Such a proposal would require appropriate notice to the public and opportunity for comment.

One commenter stated, in reference to aircraft parts and components, that manufacturers provide parts but may not have them in stock or in some cases the company may cease to exist. This can leave aircraft owners with needlessly grounded aircraft. The commenter encouraged FAA to collaborate with the industry to find a solution to this "checkmate" situation and stated perhaps there can be a way to provide a "field approval" of sorts to allow parts fabrication. Revising regulations related to parts

fabrication is out of scope of this rulemaking and would require appropriate notice to the public and opportunity for comment.

Q. Effective and Compliance Dates

The NPRM proposed requiring compliance with the rule based upon two staggered effective dates. The NPRM proposed an effective date of two months after publication of the final rule for provisions that do not depend on the creation or revision of industry consensus standards. For proposals that depend on the creation or revision of industry consensus standards, the NPRM proposed an effective date of six months after the final rule to allow organizations that are currently developing industry consensus standards to finalize its consensus standards based on the final rule; FAA review and acceptance or approval of such consensus standards; notice of availability of such standards; and sufficient time to allow manufacturers to design, retool, obtain supplies, subcontract, train employees, produce parts, assemble, conduct flight and ground testing, and create required documentation. Section IV.L of the NPRM discussed and listed the proposed rules for which this proposed six-month effective date would apply.

As proposed in the NPRM, after the effective date of six months after publishing the final rule, manufacturers of light-sport category aircraft would be unable to deliver new aircraft until all required consensus standards for the applicable class of aircraft have been revised and accepted or approved by FAA, and that are non-compliant with new requirements.

Since the delayed effective date of six months is intended to accommodate industry responsibilities for compliance with the final rule, the NPRM requested comment on whether six months appropriately balances enabling compliance as soon as practical with the need for additional time to prepare for compliance with the final rule.

Following publication of the NPRM, FAA identified other proposed amendments that would be impacted by the availability of new or revised consensus standards related to the light-sport sector. In addition, as part of its proposed amendment to § 91.319, FAA committed to developing procedures concerning operating limitations for operations over densely populated areas and in congested airways that it would provide to the public for comment prior to adoption. Those procedures impact issuance of experimental airworthiness certificates. Similarly, this final rule amends operating limitations for restricted category aircraft under § 91.313 and creates new operating limitations for experimental aircraft conducting space support vehicle flights in § 91.331. Development of procedures concerning the issuance of these operating limitations for public review and comment merits application of a longer effective date for §§ 91.313, 91.319, and 91.331.

FAA received 14 comments related to effective dates. Streamline Designs commented with respect to § 21.190(d)(6), that an effective date of at least 12 months is required to prevent a situation in which manufacturers are unable to deliver aircraft by allowing sufficient time for completion and FAA-acceptance of supporting consensus standards and for manufacturers to revise compliance documentation. FAA notes that no class of light-sport category aircraft will meet part 22 without new or revised consensus standards. Because consensus standards are a means of compliance to the final rule's requirements, they cannot be finalized until after publication of the final rule. Based on the time for industry to revise consensus standards to meet the requirements of the final rule; for FAA to review, accept or approve, and publish notices of availability for those consensus standards; for manufacturers to revise their compliance documentation; and for manufacturer compliance, FAA agrees with the commenter that an effective date of

approximately a year is necessary for any provision that depends on the creation or revision of industry consensus standards.

One commenter stated at least one year is required to promulgate guidance, allow the public time to understand the changes, and for FAA to fulfill its responsibilities. Similarly, another commenter argued that a minimum of six months is required for all proposals, given the massive scope of proposals.

FAA agrees that more time is required than provided for with the proposed first effective date of two months after publication of the final rule to promulgate draft guidance and directives with the final rule for public comment, revise those documents based on public comment, and publish final documents to support the first effective date. This rule, therefore, will apply an effective date of 90 days after publication of this final rule for provisions that do not depend on the creation or revision of industry consensus standards or new procedures for establishing operating limitations under §§ 91.313, 91.319, and 91.331.

Regarding the comment concerning the scope of the NPRM, the scope of the whole rule is not the sole factor for implementing parts of the rule. Other factors include whether a particular element of the rule is relieving, enabling, ready to implement, dependent on new or revised consensus standards and such. Some parts of the rule are clearly relieving, enabling, ready to implement, or not dependent on revised consensus standards. As such, their implementation may be quicker to enable the public to benefit sooner. Other parts of the rule require more steps for implementation and thus require more time to prepare for implementation.

The estimated time needed to implement the MOSAIC final rule is the basis for establishing the two delayed effective dates described in this rule. Accordingly, FAA will

implement some rules sooner and others later, as described for individual amendments throughout this preamble.

Hartzell Propeller doubted that two months from the final rule would be sufficient time for FAA to manage and complete projects and for FAA-accepted consensus standards to be available. The NPRM addressed this concern with a longer proposed effective date to enable completion and acceptance of new or revised consensus standards and for manufacturer compliance with those standards. As discussed previously in this section, FAA agrees that more time is required than provided for with the proposed first effective date of two months after publication of the final rule to promulgate draft guidance and directives with the final rule for public comment, revise those documents based on public comment, and publish final documents to support the first effective date.

Hartzell Propeller also commented about the effective date of the final rule as it relates to kit-built, light-sport category aircraft. Hartzell Propeller described that the process of procurement of kits and components, assembling, testing, and certification often occurs over many years. Accordingly, builders who started such projects before this final rule should not be subject to the new requirements. FAA understands and agrees with this argument. Requirements of the final rule applicable to kit-built light-sport category aircraft will apply to light-sport aircraft kits purchased on or after the applicable effective date of this rule.

Van's Aircraft requested a provision to allow existing light-sport aircraft to be produced for some period after publication of the final rule. The delayed effective date in the final rule is intended for this purpose. Van's Aircraft did not offer comment on the sufficiency of the proposed effective date of six months for this purpose. Van's Aircraft also requested provision to allow an "overlap" of unspecified duration during which

manufacturers could produce under the regulations in existence prior to the final rule or those regulations as amended by the final rule. The NPRM did not propose such an overlap provision. An overlap would require retaining both the pre-amended and as-amended text of the regulations. As described in the NPRM, the proposed rule includes deleting a definition of light sport aircraft in part 1 that is applied in multiple 14 CFR parts, the creation of part 22, and the establishment of separate eligibility requirements for aircraft, sport pilot, and light-sport repairman certification. Providing an overlap of current and proposed requirements, therefore, would require overly complex regulatory text, implementing policies and guidance, and likely cause confusion among stakeholders. FAA does not agree with changing the proposed rule to provide this overlap. Instead, the final rule applies a delayed effective date to provide sufficient time for industry to transition to compliance with the requirements of the final rule.

Nine other commenters recommended that FAA should implement the final rule as expeditiously as possible to enable the public to benefit sooner from these proposals. FAA will establish an effective date no longer than necessary to provide those with responsibilities for compliance with new requirements sufficient time for fulfilling those responsibilities.

Though FAA proposed effective dates of two and six months for this final rule, FAA recognizes the public comments on the proposed effective date given the public's responsibilities for compliance with these rules. In particular, FAA finds the comments of Streamline Designs, the former chair and current co-chair of the ASTM Committee F37 on Light Sport Aircraft, significant and compelling concerning the minimum timeline to complete industry consensus standards necessary for establishing means of compliance to many of these rules. In addition, procedures for establishing operating limitations in

issuance of experimental airworthiness certifications require public review and comment following this rulemaking as discussed in the NPRM. Accordingly, for provisions that depend on the creation or revision of industry consensus standards or new procedures for establishing operating limitations under subpart D of part 91, this action will apply an effective date of 365 days after publication of the final rule. This will allow time for organizations, such as ASTM, that are developing industry consensus standards to revise consensus standards to meet the requirements of the final rule; FAA to review, accept or approve, and publish notices of availability for those consensus standards; manufacturers to revise their compliance documentation; and compliance by light-sport manufacturers. This will also allow FAA to develop and publish draft procedures and operating limitations authorizing certain operations of experimental aircraft and restricted category aircraft; for the public to review and comment on those draft procedures and operating limitations; and for FAA to disposition public comments and publish the final procedures and operating limitations.

The effective dates for each amendment are included in the dates and amendment sections of this final rule.

R. Benefits and Costs

1. Summary of Comments

The AEA asserted newer, larger, more complex light-sport aircraft will compete with type certificated aircraft and the agency must consider the significant technical, administrative, and financial impact on the small businesses that support the aviation certification process under other provisions of part 21. Sonex expected a positive economic impact for its manufacturing business and foresees positive safety impacts and

lower costs. It concluded that the rule will facilitate the entrance of new aircraft benefiting consumers, manufacturers, maintainers, and airports.

An individual asked how fewer regulations of affected aircraft contributes to aviation safety and stated this assertion was not supported by data. The individual also questioned why FAA is concerned with recreational values. Another individual stated retractable gear, variable pitch propellors, two empty seats, and night operations do not make an airplane safer to fly. This individual also disputed that the needed changes to training courses, including the addition of retractable landing gear and variable pitch propellors, represent only a minor rewrite expense.

One individual stated FAA did not consider the recertification work for the ASI when aircraft move from one category to the expanded light-sport category. Another commented on the cost of purchasing ASTM Standard F2245 from ASTM instead of free availability from FAA. Another individual requested an ASTM standard for parts, engines, etc. so aircraft can be upgraded without imposing burdensome costs on the average aviator.

One individual stated several proposals unnecessary and irrelevant for powered parachutes would require extra paperwork from manufacturers, pilots, and repairmen causing a switch from powered parachutes to less safe aircraft. Another individual stated the rule will provide economic incentives to increase the number of active pilots as well as provide them with new affordable aircraft and related technologies, boosting the number of jobs available in the aviation industry. Another individual stated the rule will lower flight training costs for students by increasing the availability of less expensive, more fuel-efficient aircraft for primary flight training. They concluded the rule would help reduce a pilot deficit.

2. FAA Response

FAA addresses the issue of competition with type-certificated aircraft in section IV.C. As noted in that section, this rule has no impact on airplanes with more than four seats. Further, with safety as its top priority, FAA must consider broader needs and opportunities for improving safety within general aviation that may be achieved by improving the safety of the light-sport category through the expansions in aircraft eligibility, operating privileges, and sport pilot privileges contained in the rule. Though impacts will depend on the extent to which affected entities pursue these opportunities and the specific results, the potential for benefits noted by Sonex exists.

Regarding potential safety impacts, FAA addresses the data and rationale that support expanding the types of aircraft and features that can be operated as light-sport aircraft, and operating privileges for sport pilots, generally in section IV.C. Specific discussion on why FAA believes these feature and operating rule changes, such as retractable landing gear, variable pitch propellers, or night operations, do not constitute a change in safety can be found in the respective portions of section IV. Recreational activity is a large component of light-sport aircraft operations. However, FAA acknowledges recreational value is not the motivation for the rule and does not consider it in the benefit-cost analysis.

Regarding the rewrite of training courses, for the NPRM, FAA stated providers of training for light-sport repairmen would have to submit their courses to FAA for acceptance within six months after rule publication. However, as described in section IV.I of this preamble, FAA has determined the existing training courses already contain the applicable content. Therefore, there will be no need to review or revise training courses. The exception is two training courses on gliders that will need to be

updated to include content on both unpowered and powered gliders for which FAA has provided a one-year compliance period.

There would not be recertification activity for ASIs. Airworthiness certificates issued to light-sport category aircraft under § 21.190 and experimental light-sport category aircraft under § 21.191(i) before the effective date of this final rule remain in effect after the effective date of this final rule. Those aircraft do not change categories after the effective date of this final rule. Recertification of those aircraft is not required.

Industry consensus standards bodies develop many consensus standards to support certification of various aviation products, articles, and services. ASTM is the only consensus standards body to date that has specifically developed consensus standards for certification of light-sport category aircraft. In the United States, these consensus standards are primarily to help aircraft manufacturers of light-sport category aircraft meet the design, production, and airworthiness requirements of part 22. Though FAA recognizes the commenter's willingness to purchase these consensus standards for greater familiarization with the certification pedigree of the commenter's aircraft, an owner of a light-sport category aircraft is not required to purchase or be familiar with these consensus standards. ASTM consensus standards concerning light-sport category aircraft include design and manufacture of aircraft engines and parts. The rule expands provisions for alterations of light-sport category aircraft.

Regarding powered parachutes, the commenter does not say which proposals will increase costs including extra paperwork and testing. FAA addresses paperwork requirements further in section V.E. FAA agrees with comments regarding the potential for new affordable aircraft and lower flight training costs.

V. Regulatory Notices and Analyses

A. Regulatory Impact Analysis

Executive Orders 12866 (“Regulatory Planning and Review”) and 13563 (“Improving Regulation and Regulatory Review”) require agencies to regulate in the “most cost-effective manner,” to make a “reasoned determination that the benefits of the intended regulation justify its costs,” and to develop regulations that “impose the least burden on society.” OMB has determined that this rule is not a significant regulatory action as defined in section (3)(f) of Executive Order 12866.

This final rule is considered an E.O. 14192 deregulatory action. Details on the estimated cost savings of this rule can be found in the rule's economic analysis. This section provides FAA’s analysis of the regulatory impact of the rule.

1. Introduction and Background

This rule modernizes the regulatory approach to light-sport aircraft, incorporating performance-based requirements that reflect advances in technology and use cases for this type of aircraft. FAA designed the rule to respond to the evolving needs of this sector and provide for future growth and innovation without compromising safety. The rule also includes amendments concerning certification and operations of aircraft (other than light-sport aircraft) that hold special airworthiness certificates.

An airworthiness certificate is an FAA document that grants authorization to operate an aircraft in flight. A registered owner or owner's agent of an aircraft may apply for an airworthiness certificate. FAA issues two different classifications of airworthiness certificates: standard and special. A standard airworthiness certificate (FAA form 8100-2 displayed in the aircraft) is FAA's official authorization allowing for the operation of type certificated aircraft in the following categories: normal, utility, acrobatic, commuter,

transport, manned free balloons, and special classes. A special airworthiness certificate (FAA Form 8130-7) is authorization to operate an aircraft, including type certificated,[324] in the U.S. airspace in one or more of the following types shown in Table 7. The rule affects the light-sport and experimental types of special airworthiness certificates shown in Table 7. There are also minor changes affecting the restricted category.

Table 7. Types of Special Airworthiness Certificates

Category	Purpose
Primary	Aircraft flown for pleasure and personal use
Restricted	Aircraft with a "restricted" type certificate, including: agricultural, forest and wildlife conservation, aerial surveying, patrolling (pipelines, power lines), weather control, aerial advertising, other operations specified by the Administrator
Multiple	Multiple airworthiness certificates restricted category aircraft
Limited	Aircraft with a "limited" type certificate
Light-sport	Operation of a light-sport aircraft
Experimental	Aircraft flown for research and development, showing compliance with regulations, crew training, exhibition, air racing, market surveys, operating amateur-built aircraft, operating kit-built aircraft, operating light-sport aircraft, unmanned aircraft systems
Special flight permit	Special-purpose flight of an aircraft that is capable of safe flight
Provisional	Aircraft with a "provisional" type certificate for special operations and operating limitations
Source: https://www.faa.gov/aircraft/air_cert/airworthiness_certification/sp_awcert.	

a. Light-Sport Category Aircraft

The rule expands the classes of aircraft that may be certificated using consensus standards as light-sport category aircraft; removes weight limits; increases capacity for passengers, fuel, and cargo; enables electric propulsion; and enables faster, higher-performing aircraft. Table 8 summarizes these changes.

Table 8. Summary of Changes for Light-Sport Category Aircraft[1]

Feature	Current[2]	Final Rule[3]
Aircraft class	Airplanes, gliders, lighter-than-air, powered parachute, and weight-shift-control	Not prescribed

Table 8. Summary of Changes for Light-Sport Category Aircraft[1]

Feature	Current[2]	Final Rule[3]
Maximum number of seats	2 seats	4 seats for airplanes 2 seats for others
Maximum weight	1,320 pounds for land-based aircraft 1,430 pounds for amphibious aircraft	Not prescribed
Maximum stall speed	45 knots V_{S1} CAS	61 knots V_{S0} CAS for airplanes 45 knots V_{S0} for glider Unchanged for others
Maximum airspeed	120 knots CAS	250 knots CAS
Engine	Single reciprocating engine	Not prescribed
Propeller	Fixed or ground-adjustable if powered other than powered glider; fixed or feathering if powered glider	Not prescribed
Landing gear	Fixed	Not prescribed

CAS = calibrated airspeed; V_{S0} = stall speed with full flap extension; V_{S1} = stall speed without the use of lift-enhancing devices
1. 14 CFR 21.190.
2. Per 14 CFR 1.1 definition of light-sport aircraft.
3. Per 14 CFR 21.190 eligibility.

b. Noise Standards

The rule amends part 36 to add a voluntary means for aircraft owners and manufacturers of aircraft that do not conform to a type certificate to demonstrate compliance with part 36 noise levels. Aircraft owners and manufacturers can comply with the noise standards through FAA-approved consensus standards, the applicable part 36 appendix, or the development of an ad-hoc certification basis determined by FAA for new and novel aircraft.

c. Sport Pilots

The rule expands privileges for sport pilots, including to operate most of the new light-sport category aircraft. There are also new privileges granted to sports pilots for model-specific light-sport category aircraft with simplified flight controls, helicopters,

automatic constant-speed and manual controllable pitch propellers, retractable landing gear, unprescribed limit on maximum speed, and night operations. Table 9 summarizes these changes and Table 10 summarizes changes to associated training.

Table 9. Summary of Changes to Sport Pilot Privileges[1]

Category	Current[2]	Final Rule[3]
Aircraft privileges	Airplanes, gliders, weight-shift-control, powered-parachutes, lighter than air, and gyroplanes	Adds helicopters with simplified flight controls certificated under § 21.190; adds simplified flight controls model-specific privilege for aircraft with simplified flight controls designation
Maximum seats	2 (2 persons)	4 seats for airplanes (2 persons) 2 seats for others
Weight	1,320/1,430 pounds	Not prescribed
Maximum stall speed	45 knots CAS	59 knots (V_{S1}) CAS for airplanes only, 45 knots CAS for other categories
Maximum airspeed	120 knots CAS	Not prescribed
Engine	Single, reciprocating	Not prescribed
Propeller	Fixed or ground-adjustable (powered other than glider)	Allow airplanes with a manual controllable pitch propeller (with training)
Landing gear	Fixed except glider (fixed or feathering)/water (fixed, retractable, or hull)	Allow aircraft that have retractable landing gear (with training)[4]
Pilot endorsements	NA	For simplified flight control designated aircraft, night operations, controllable pitch propeller, and retractable landing gear
Sport pilot in command limitation	Privileges and limitations exist	Clarifying an existing limitation that states pilots may not act as PIC of an aircraft requiring a type rating
Medical certificates	Daytime operations: valid driver's license[5] Night operations: NA	Daytime operations: no change Night operations: BasicMed[6] or FAA medical certificate

NA = not applicable
CAS = calibrated airspeed; V_{S1} = stall speed without the use of lift-enhancing devices
1. Applies to experimental and light-sport category aircraft, and small type- and production- certificated aircraft (14 CFR part 23).
2. 14 CFR 1.1 definition of light-sport aircraft.
3. Part 61 eligibility criteria.

Table 9. Summary of Changes to Sport Pilot Privileges[1]

Category	Current[2]	Final Rule[3]
4. The final rule includes a provision to allow pilots with pilot in command experience in aircraft intended for operation on water with retractable gear to continue to operate these aircraft without additional training and endorsement in new § 61.331(c). 5. Applies if most recently issued medical certificate (if the person has held a medical certificate) has not been suspended or revoked or most recent Authorization for a Special Issuance of a Medical Certificate withdrawn. 6. BasicMed is an alternate way for pilots to fly without holding an FAA medical certificate as long as they meet certain requirements of § 61.23(c).		

Table 10. Summary of Changes to Sport Pilot and Instructor Training

Category	Current	Final Rule
Sport pilot certificate Sport pilot flight instructor certificate	Training in applicable knowledge and flight operations by authorized instructor; knowledge test and practical test for 1 of 5 aircraft category privileges.[1] Specified flight experience.	Sport pilot: new helicopter with simplified flight controls privilege available. Sport pilot flight instructor: new training privilege for helicopters with simplified flight controls.
Sport pilot: Add another category and class privilege Sport pilot flight instructor: Add another category and class training privilege	Training in applicable knowledge and flight operations by authorized instructor; proficiency check with another authorized instructor	Practical test[2] for airplane or helicopter with simplified flight controls privilege; no change for other
Simplified flight controls model-specific endorsement	NA	Sport pilot[3]: flight training in the model-specific aircraft or in a corresponding flight training device or simulator and logbook endorsement from an authorized instructor New applicant: practical test
Endorsement for aircraft retractable landing gear, and airplane controllable pitch propeller	NA	Training and certifying logbook endorsement
Flight simulation training device and aviation training device credit	NA	Allow for up to 2.5 hours for training credit in a qualified device representing the appropriate category and class aircraft
Night operations	NA	Training and certifying endorsement from an authorized instructor

Table 10. Summary of Changes to Sport Pilot and Instructor Training

Category	Current	Final Rule
Flight proficiency requirements for sport pilot and flight instructor with sport pilot	Lists of required tasks for training	Added heliport and hovering maneuvers which apply to helicopters only
Flight instructor qualifications (Subpart H only)	NA	Training in an aircraft with simplified flight controls requires an instructor to be qualified in category and class prior to adding the make and model limitation
Flight instructor for new make and model-initial cadre	NA	An instructor pilot may serve as a flight instructor for the purposed of initial cadre[5]
Testing standards for Rotorcraft Category Helicopter—Simplified Flight Controls Privilege	NA	FAA-S-ACS-26, Sport Pilot for Rotorcraft Category Helicopter—Simplified Flight Controls Privilege Airman Certification Standards; FAA-S-ACS-31, Flight Instructor with a Sport Pilot Rating for Rotorcraft Category Helicopter—Simplified Flight Controls Privilege Airman Certification Standards

NA = not applicable
1. Airplane, glider, weight shift control aircraft, powered parachute, or lighter-than-air.
2. Compared to a proficiency check, a practical test is a more formal test conducted by an FAA aviation inspector or Designated Examiner.
3. Must already hold category and class privilege of the simplified flight controls model-specific aircraft.
4. If the model-specific aircraft has operating characteristics precluding completing all the category and class tasks required by airman certification standards, the applicant's certificate will have a model-specific limitation that could be later removed with appropriate additional testing.
5. Instructor pilot can be a pilot employed or used by the manufacturer of an aircraft with simplified flight controls designation.

d. Maintenance and Repairmen

The rule expands light-sport repairmen privileges to align with the expansions of eligibility for certification of light sport category aircraft. The rule also clarifies

provisions for persons acceptable to FAA who may perform repairs and alterations of light-sport category aircraft. The rule also removes the requirement for owners/operators of light-sport category aircraft to comply with safety directives issued by the aircraft manufacturer.

FAA is also replacing the specified aircraft class training hour requirements with a performance-based standard for light-sport repairman maintenance rating training.

e. Space Support Vehicles

The rule codifies language in the FAA Reauthorization Act of 2018 (Public Law 115–254) that authorized certain operators of aircraft with special airworthiness certification in the experimental category to conduct space support vehicle flights carrying persons or property for compensation or hire to simulate space flight conditions.

f. Operations

The rule updates regulations related to operating limitations for experimental aircraft, restricted category aircraft, and light-sport aircraft. For example, the rule allows the Administrator to issue operating limitations to authorize certain aircraft with experimental airworthiness certificates to operate over densely populated areas and in congested airways for all flight segments, beyond takeoffs and landings.

FAA is also allowing some light-sport category aircraft to conduct certain aerial work operations for compensation or hire, which expands the limited exceptions for light sport category aircraft to conduct operations for compensation or hire beyond the flight training and glider towing operations allowed previously.

2. Need for the Regulation

This section describes the need for the regulation, including a description of the problem, technological changes, market failure, FAA strategic goals, and requirements mandated by Congress.

a. Description of Problem

FAA must update its regulations periodically to keep pace with technological and industry changes, and to add or remove requirements based on experience. With respect to special airworthiness certificates, updates are warranted to codify provisions FAA has granted in multiple exemptions based on safety considerations. Adopting more performance-based standards provides industry greater latitude for rapid revisions to supporting consensus standards as needed to address emerging safety issues as well as for enabling more rapid innovation. FAA determined that performance-based rather than time-based training for light-sport repairmen is also appropriate. Also, regulations requiring certification to noise standards currently do not apply to aircraft that are not type-certificated and FAA has determined that it is now appropriate to allow for voluntary compliance by manufacturers of these aircraft.

b. Technological Changes

Current regulations for light-sport aircraft contain a specific weight limit. Changing this limit to a performance limit may improve safety by enabling greater inclusion of safety-enhancing technologies such as parachutes, ADS-B, and AOA displays. Greater weight allowances will also enable sturdier designs that are able to withstand the rigors of a flight training environment and greater utility in extended range and endurance as a personal recreational aircraft. Removing weight restrictions also enables electric powered aircraft to carry more battery weight, which improves the range

and performance of electrically powered aircraft. Also, FAA is increasing the maximum airspeed for light-sport aircraft to account for potential advances in technology and manufacturing practices.

The rule also permits any type of engine or propeller to be installed on light-sport category aircraft. This change enables performance enhancements beyond the reciprocating engines and fixed-pitch propellers that currently define light-sport category aircraft. New types of engines could include electric, turbine, compressed natural gas, hydrogen, or solar. For example, electric flight is now available on the market, but currently cannot be flown as a light-sport category aircraft or by a sport pilot.[325]

c. FAA Strategic Goals

FAA's 2021 Continued Operational Safety Report for Special Category Light-Sport Aircraft[326] describes its vision of increasing industry accountability and safety, with a goal of an equivalent or lower fatal accident rate than other segments of "personal" aviation, without requiring FAA type design certification or FAA production oversight. This vision includes supporting a regulatory and policy structure for industry to achieve FAA safety goals through self-declared compliance with industry developed and maintained consensus standards. The rule implements this vision.

d. Congressional Mandate

This rule also codifies language in the FAA Reauthorization Act of 2018 (Section 581) authorizing certain operators of aircraft with an experimental airworthiness certificate to conduct space support vehicle flights carrying persons or property for compensation or hire. An operator may conduct space support vehicle flights to simulate space flight conditions in support of training for potential space flight participants, government astronauts, or crew; the testing of hardware to be used in space flight; or

research and development tasks, which require the unique capabilities of the aircraft conducting the flight.

Finally, as stated in section II, this rule addresses section 824 of the FAA Reauthorization Act of 2024, which requires that FAA issue a final rule not later than 24 months after the date of enactment of that Act, May 16, 2024.

3. Baseline for the Analysis

The baseline for the analysis of incremental benefits and costs of the rule includes existing regulations and standards, affected entities and the aircraft to which the rule applies, and existing risks including safety and environmental.

a. Existing Regulations and Standards

The 2004 final rule, Certification of Aircraft and Airman for the Operation of Light-Sport Aircraft (69 FR 44772), established regulations for the manufacture, certification, operation, and maintenance of light-sport aircraft. The 2004 final rule specifies maximum weight, stall speed, airspeed, and seats; engine, propeller, and landing gear types; requirements for maintenance and repairs; and requirements and privileges for sport pilots. These specifications and certification requirements reflect small, simple, easy-to-fly aircraft for sport and recreation with small range. Regulations in 14 CFR 21.191 cover experimental light-sport aircraft, including kit-built, intended for the purposes shown in Table 7.

FAA also works with industry in developing consensus standards for light-sport category aircraft, which it reviews periodically. Currently, consensus standards for the certification of light-sport category aircraft have been developed by ASTM and accepted for use by FAA.[327] For example, in 2023, FAA reapproved (completed review with no

technical changes) ASTM F2724-14, Standard Specification for Pilot's Operating Handbook (POH) for Light Sport Airplane.

Regulations in part 23 cover airworthiness standards for normal category airplanes.[328] FAA amended its airworthiness standards for normal, utility, acrobatic, and commuter category airplanes in 2016 by replacing prescriptive design requirements with performance-based airworthiness standards (81 FR 96572). The standards provide risk-based divisions for airplanes with a maximum seating capacity of 19 passengers or less and a maximum takeoff weight of 19,000 pounds or less.

Regulations in part 36 establish the applicability, standards, and test methods for aircraft noise. FAA's noise certification process is entirely performance-based; there are no noise-reduction technologies defined in the noise regulations. Applicants are free to choose any methods or technologies that allows their aircraft to pass the noise limits. FAA sets the noise limits in the regulations so that aircraft with current technology pass those noise limits.

Currently, noise standards do not apply to previously defined special light-sport aircraft or experimental light-sport aircraft in the United States. Foreign light-sport aircraft manufacturers, however, may already be subject to noise testing and certification requirements. For example, EASA and Australia both require almost all aircraft operating in their airspace, including light-sport aircraft, to comply with the environmental noise protection requirements contained in the Standards of ICAO Annex 16, Volume I. Therefore, any domestic or foreign light-sport aircraft manufacturers in these markets that also export to the United States are already required to comply with accepted standards for noise.

b. Affected Entities

The rule may affect manufacturers, pilots, and repairmen of light-sport category aircraft and experimental light-sport category aircraft. This section describes these entities. The rule could also provide additional options for entities performing certain types of aerial work and those involved with space support vehicles.

i. Manufacturers

The rule may affect aircraft, aircraft engine, and aircraft parts manufacturers (North American Industry Classification 33641) to the extent that they design and manufacture the types of aircraft for which performance-based standards apply. For example, FAA maintains a listing of all known make/model combinations that have received, or may be eligible to receive, special airworthiness certificates as light-sport category aircraft.[329] Data from June 2022 show a total of 208 make/model combinations from 70 foreign and 59 US manufacturers. FAA Registry[330] data provide information to identify which of these models are being produced currently. Table 11 shows these data.

Table 11. Manufacturers of Light-Sport Category Aircraft[1]

Category	Manufacturers[2]	Models[3]
US	26	35
Foreign	28	38
Total	54	73

Source: FAA Registry.
1. Based on production from 2018-2022.
2. Includes manufacturers of previously defined special light-sport aircraft and experimental light-sport aircraft (drop down and kits).
3. Produced since 2020.

ii. Pilots

In 2023, there were over 7,000 active sport pilots (Table 12). For comparison, Table 12 also shows the number of pilots in other small aircraft categories.

Table 12. Estimated Active Airmen Certificates Held

Category	Number
Recreational (only)	71
Sport (only)	7,144
Private Airplane	167,711
Rotorcraft (only)	13,428
Glider (only)	21,292
Source: 2023 Active Civil Airman Statistics, Table 1, available at: https://www.faa.gov/data_research/aviation_data_statistics/civil_airmen_statistics	

FAA conducts a General Aviation Survey to estimate activity levels. Table 13 shows baseline estimates of hours flown in different aircraft types for recent years.

Table 13. Estimated Total Hours Flown

Category	2022	2021	2020
Gliders	75,574	92,002	50,352
Lighter-than-air	77,090	64,323	35,535
Experimental - Amateur	1,001,165	1,105,526	943,995
Experimental Light-sport[1]	138,874	148,963	117,529
Experimental - Exhibition	73,511	92,588	64,221
Other Experimental	65,265	46,616	50,177
Special Light-sport	231,068	245,156	201,615
1. Experimental light-sport includes aircraft with experimental airworthiness certification and light-sport aircraft for which airworthiness certificates are not final. Source: FAA General Aviation and Part 135 Activity Survey, Table 1.3 and 2.1. Available at: https://www.faa.gov/data_research/aviation_data_statistics/general_aviation.			

iii. Repairmen

In 2023, there were 283 light-sport aircraft repairmen.[331]

c. Risks

Existing safety and environmental risks include accidents and noise profiles of light-sport aircraft. Table 14 shows accidents and fatalities involving previously defined special light-sport aircraft. Table 15 shows accidents, fatalities, and serious injuries involving EAB aircraft.

Table 14. Accidents and Fatalities: Special Light-Sport Category Aircraft

Year	Fatal Accidents	Fatalities	Nonfatal Accidents
2023	3	4	53
2022	9	13	47

Table 14. Accidents and Fatalities: Special Light-Sport Category Aircraft

Year	Fatal Accidents	Fatalities	Nonfatal Accidents
2021	5	6	54
2020	4	4	63
2019	4	7	75
Source: FAA 2024 data.			

Table 15. Accidents, Fatalities, and Injuries: EAB Aircraft

Year	Fatal Accidents	Nonfatal Accidents	Fatalities	Serious Injuries
2023	34	141	39	35
2022	38	124	55	27
2021	37	117	46	38
2020	39	118	49	34
2019	38	141	47	32
Source: NTSB, 2024. Case Analysis and Reporting Online (CAROL). Accessed November.				

In 2012, NTSB found there are a disproportionate number of accidents involving EAB aircraft relative both to their proportion of the general aviation fleet and their share of general aviation flight activity. NTSB found the overall accident rate per 1,000 aircraft to be nearly twice that of comparable non-EAB aircraft, and the fatal accident rate between 2.5 and 3 times higher.[332]

FAA does not have data on the baseline noise profiles of light-sport category aircraft. FAA's noise certification regulations, however, are technology-following. This means that FAA intends to allow aircraft with current noise-reduction technology to successfully meet those requirements, but not aircraft with older or louder technology (e.g., two-stroke engines, unmuffled exhaust). FAA also intends for its noise certification requirements to provide a basis for comparing aircraft noise levels, but not as a method for determining how the noise of aircraft operations affects people. FAA treats the effects of aircraft noise in part 150 and 161. The rule does not modify or supplant part 150 and 161.

4. Benefits

The benefits of the rule include the value of changes in safety and environmental risks.

a. Safety Benefits

The rule could reduce risks associated with light-sport category aircraft to the extent that the relaxation of certain requirements spurs changes that make these aircraft safer to fly. For example, removing the specific weight limit provides greater flexibility for the inclusion of safety-enhancing technologies such as parachutes, ADS-B, and angle of attack displays. The performance-based rules could also enhance safety by enabling appealing alternatives to EAB aircraft that do not meet 14 CFR or consensus standards. FAA determined that removing the requirement to comply with safety directives issued by the aircraft manufacturer would not adversely affect safety because any safety-of-flight condition underlying such directive would need to be corrected for aircraft to be in airworthy condition.

For example, as shown in Table 15, in 2023 there were 39 fatalities and 35 serious injuries from 34 fatal and 141 nonfatal accidents involving EAB aircraft. FAA estimates the value of reducing the risk of fatalities and injuries using the value of statistical life (VSL)[333] and the Maximum Abbreviated Injury Scale (MAIS)[334]. For example, reduction in the risk of one fatality generates benefits equal to the VSL (approximately $13.7 million). Reduction in the risk of serious injury generates benefits equal to the fraction of the VSL associated with MAIS level 3 (.105), or approximately $1.4 million (0.105 × $13.7 million; Table 16).

Table 16. Values Associated with Levels of Injury Severity Based on the VSL

MAIS Level	Severity	Fraction of VSL	Value[1]
MAIS 1	Minor	0.003	$41,100

Table 16. Values Associated with Levels of Injury Severity Based on the VSL

MAIS Level	Severity	Fraction of VSL	Value[1]
MAIS 2	Moderate	0.047	$643,900
MAIS 3	Serious	0.105	$1,438,500
MAIS 4	Severe	0.266	$3,644,200
MAIS 5	Critical	0.593	$8,124,100
MAIS 6	Unsurvivable	1	$13,700,000

VSL = value of statistical life
1. Fraction of VSL multiplied by VSL.

Given the number of fatalities and serious injuries, relatively small reductions in risks enabled by the rule could generate substantial benefits (e.g., a 10 percent reduction in fatalities and serious injuries from the 2023 level for amateur-built aircraft would generate undiscounted benefits of $53 million and $5 million, respectively).[335] However, since these types of modifications and developments are yet to be available, FAA is not able to estimate the potential for risk reductions under the rule.

The rule will also enable larger light-sport category aircraft and higher airspeeds. However, because the accompanying performance-based design standards require predictable control and maneuverability through all phases of flight without requiring exceptional piloting skill, FAA does not anticipate that the increases will increase safety risks for sport pilots. The adjusted training requirements for sport pilots seeking these privileges, and light-sport repairmen maintaining these planes, also ensure against increased risks. Finally, the rule allows light-sport category aircraft to be used in limited aerial work. FAA determined these limited operations also will not negatively affect safety.

b. Environmental Benefits

FAA sets noise certification limits so that aircraft with current technology can meet those limits. As a result, FAA expects the rule will likely not lead to significant noise reductions. However, voluntary compliance with the standards could keep new

designs and modifications of existing aircraft from increasing noise above the limit. Because FAA cannot predict the amount of increase in noise that would occur in the absence of the rule, and compliance with noise standards is voluntary, it is unable to quantify these benefits.

The potential for adoption of new technologies such as electric motors also has the potential to reduce noise levels (as well as aircraft emissions). FAA also does not have an estimate of the extent of adoption of such technology with and without the rule to estimate potential benefits.

c. Uncertainty

There are several limitations in the analysis of benefits. Table 17 provides the limitations and the likely impact on the potential for benefits.

Table 17. Uncertainties in the Analysis of Benefits

Assumption or Uncertainty	Direction of Impact	Comments
Voluntary compliance with noise standards	+	There may be trade-offs required between desired performance and noise compliance.
Technological advances improving safety and the environment	+	The potential for benefits may directly relate to specific technological advances, and manufacturer incorporation of such improvements in new or modified designs.
Future activity levels	?	Different factors (e.g., unmanned activity, environmental or safety concerns) could influence activity in this sector in different directions.
'+' = Positive impact on benefits; '?' = uncertain impact on benefits		

5. Costs

The rule could result in incremental compliance costs for design and production of light-sport category aircraft. The sections below also discuss cost considerations

relevant to training and operations provisions, and voluntary compliance with noise certification.

a. Design and Production

The rule establishes performance-based design and production standards for light-sport category aircraft. As a result, most, if not all, existing consensus standards for the areas in subpart B of part 22 need revision. Manufacturers are not required to take advantage of the expanded design opportunities, but for those that do, the cost of conformance to revised consensus standards will be inherent in the new design.

There could be implications for continued production of existing light-sport category aircraft depending on the make and model design. Part 22 standards that may impact manufacturers most include fire protection and emergency evacuation.[336] Since current standards used to demonstrate compliance for current make and model aircraft designs represent minimum requirements, FAA does not have data on those designs that exceed current minimum standards to a degree that will meet revised standards.

There may also be opportunity costs (lost production) to the extent it takes longer than 12 months (the effective date of the standards) for industry to revise consensus standards and FAA to accept those standards.

The rule also expands the criteria for aircraft that may be certified as light-sport category aircraft through consensus standards. Because obtaining a special airworthiness certificate through conformance with consensus standards may be less costly compared to obtaining type certification under part 23, manufacturers may experience cost savings. FAA does not have data on the incremental difference in design cost under type certification compared to consensus standards.

b. Noise Certification

Manufacturers of light-sport category aircraft may voluntarily comply with the noise standards in part 36 and provide an SOC for their aircraft. Manufacturers can comply using consensus standards, once developed, in lieu of traditional noise measurement flight tests.

FAA expects costs for noise certification to be significantly less (minimal) using consensus standards compared to traditional testing. FAA is researching methods to support the industry in developing these consensus standards. The preliminary investigation shows that existing SAE standards for predicting light propeller-driven aircraft noise have potential for further development into a modeling-based consensus standard tool. Such a tool will also assist manufacturers in making design choices early in the development process.

Because consensus standards are not yet available, FAA also estimated an upper bound cost based on using the applicable part 36 appendix. This method entails developing a noise certification test plan, submitting the plan for approval by FAA, conducting the required noise measurements, and submitting the noise certification report for FAA's review and approval. Based on experience with type-certificated airplanes, FAA estimates that noise certification testing costs using Appendices J, G, and F (light helicopters and propeller driven aircraft) to part 36 is at most $20,000 per model.[337]

c. Sport Pilot Certification and Training

The rule revises the required training for a sport pilot or sport pilot instructor seeking to add another class privilege from training and a proficiency check to training and a practical test. This change is because these two privileges (airplane and helicopters with simplified flight controls) result in the operation of larger and heavier aircraft with

speeds up to 250 knots CAS and operation in Class B, C, and D airspace. The rule also adds training requirements to accommodate the expanded privileges (simplified flight controls model-specific endorsement, and endorsements for complex aircraft, night operations, and aircraft with retractable landing gear). FAA is facilitating these operations, which necessitates the endorsements, but these operations are not required and, therefore, do not impose any mandatory costs.

The rule does not impose increased training or testing costs on any pilots, though those seeking to add a sport pilot airplane or rotorcraft privilege to an existing pilot certificate will require the practical tests. Those who successfully complete the updated requirements will receive the privileges that were not previously available (though it is possible that some individuals could prefer the current unexpanded category, privileges, and training).

d. Repairmen Certification and Training

The rule replaces the minimum training course hour requirements for light-sport repairmen with performance-based standards. The rule requires that training courses must, at a minimum, include the knowledge, risk management, and skill elements for each subject contained in the Aviation Mechanic General, Airframe, and Powerplant Airman Certification Standards, as appropriate to the category, and class as applicable, of aircraft being taught.

Existing light-sport repairman training courses already contain the course content that a light-sport repairman must know to obtain the applicable rating and aircraft category privileges sought.[338] Therefore, these courses already contain and align with the applicable content of the Mechanic ACS. Removing the hours-based requirement may result in some time savings, depending on the course.

e. Cost Savings from Other Rule Provisions

The rule allows light-sport category aircraft to be used in certain aerial work. Some light-sport category aircraft may be less costly than the aircraft currently being used for this work such that there could be cost savings associated with switching. However, FAA does not have data to estimate the extent the rule will result in a switch to light-sport category aircraft for the limited types of work allowed or associated cost savings.

f. Uncertainty

Table 18 provides a summary of key uncertainties and assumptions and the likely direction of impact on the compliance cost estimates.

Table 18. Uncertainties in the Analysis of Compliance Costs

Assumption or Uncertainty	Impact on Costs	Comments
Design changes needed for revised consensus standards	+	Some changes may be needed in the areas of fire protection and emergency evacuation for some models. For noise, FAA does not have data concerning the impact of applying part 36 standards to current make and model designs.
Reduced design costs for models that could meet consensus standards rather than be type-certificated	-	The extent to which manufacturers pursue one certification path versus the other is not known.
No costs associated with aligning and conforming rule changes	?	Changes are largely enabling in nature.
'+' = positive impact on costs; '-' = negative impact on costs; '?' = uncertain impact on costs		

6. Summary

The rule largely expands opportunities in the light-sport aircraft sector. As such, benefits and costs depend on the extent to which affected entities pursue these opportunities and the specific results. These expansions may result in safety; there may also be associated design and production costs and cost savings. The rule also amends

part 36 to allow for voluntary compliance with noise standards by manufacturers in this sector. FAA expects the cost to comply voluntarily with the noise standards to be minimal using industry consensus standards. FAA does not anticipate more than minimal incremental costs for other provisions of the rule. FAA also does not have data to estimate any cost savings, such as could result from operating certain light-sport category aircraft in aerial work for compensation.

B. Regulatory Flexibility Act

The Regulatory Flexibility Act (RFA) of 1980, (5 U.S.C. 601–612), as amended by the Small Business Regulatory Enforcement Fairness Act of 1996 (Pub. L. 104–121) and the Small Business Jobs Act of 2010 (Pub. L. 111–240), requires Federal agencies to consider the effects of the regulatory action on small business and other small entities and to minimize any significant economic impact. The term "small entities" comprises small businesses and not-for-profit organizations that are independently owned and operated and are not dominant in their fields, and governmental jurisdictions with populations of less than 50,000.

This final rule largely expands opportunities for manufacturers of light-sport category aircraft. FAA does not anticipate more than minimal incremental costs to implement provisions of the rule. Also, compared to the proposed rule, this final rule enables manufacturers to voluntarily comply and state compliance with part 36 noise requirements. Given the voluntary compliance with noise standards, manufacturers will comply under circumstances beneficial to their business.

If an agency determines that a rulemaking will not result in a significant economic impact on a substantial number of small entities, the head of the agency may so certify under section 605(b) of the RFA. Therefore, as provided in section 605(b) and based on

the foregoing, the head of FAA certifies that this rulemaking will not result in a significant economic impact on a substantial number of small entities.

C. International Trade Impact Assessment

The Trade Agreements Act of 1979 (Pub. L. 96-39), as amended by the Uruguay Round Agreements Act (Pub. L. 103-465), prohibits Federal agencies from establishing standards or engaging in related activities that create unnecessary obstacles to the foreign commerce of the United States. Pursuant to these Acts, the establishment of standards is not considered an unnecessary obstacle to the foreign commerce of the United States, so long as the standard has a legitimate domestic objective, such as the protection of safety and does not operate in a manner that excludes imports that meet this objective. The statute also requires consideration of international standards and, where appropriate, that they be the basis for U.S. standards. FAA has assessed the potential effect of this proposed rule and determined it would respond to a domestic safety objective and would not be considered an unnecessary obstacle to trade.

D. Unfunded Mandates Assessment

The Unfunded Mandates Reform Act of 1995 (2 U.S.C. 1531-1538) governs the issuance of Federal regulations that require unfunded mandates. An unfunded mandate is a regulation that requires a State, local, or tribal government or the private sector to incur direct costs without the Federal government having first provided the funds to pay those costs. FAA determined that the rule will not result in the expenditure of $187,000,000 or more ($100,000,000 adjusted for inflation using the most current Implicit Price Deflator for the Gross Domestic Product) by State, local, or tribal governments, in the aggregate, or the private sector, in any one year.

E. Paperwork Reduction Act

The Paperwork Reduction Act of 1995 (44 U.S.C. 3507(d)) requires that FAA consider the impact of paperwork and other information collection burdens imposed on the public. According to the 1995 amendments to the Paperwork Reduction Act (5 CFR 1320.8(b)(2)(vi)), an agency may not collect or sponsor the collection of information, nor may it impose an information collection requirement unless it displays a valid OMB control number.

This action contains amendments to the existing information collection requirements approved under OMB Control Numbers 2120-0018, 2120-0022, 2120-0690, and 2120-0730. As required by the Paperwork Reduction Act of 1995 (44 U.S.C. 3507(d)), FAA has submitted these proposed information collection amendments to OMB for its approval.

Summary and Use: FAA is proposing to amend rules for the manufacture, certification, operation, maintenance, and alteration of light-sport category aircraft. Certificate holders required to comply would experience the following conforming revisions to existing information collection activities:

Table 19: Summary of Conforming Revisions

Control Number	Revisions
2120-0018	FAA Form 8130-6, Application for U.S. Airworthiness Certificate: • Update the "LIGHT-SPORT" field to accommodate any aircraft class • Update the "RESTRICTED" filed to add newly codified operations • Update the "EXPERIMENTAL" field to add new purpose for operating former military aircraft FAA Form 8130-15, Light Sport Aircraft Statement of Compliance:

Table 19: Summary of Conforming Revisions

Control Number	Revisions
	• Update the "Check applicable items" field to change the 14 CFR reference for kits, accommodate any aircraft class, and indicate whether the aircraft meets eligibility requirements in part 61 for a sport pilot • Update the "FAA Applicable Accepted Standard(s)" and corresponding "Manufacturer's Documentation" fields to reflect new requirements for manufacturer's training requirements, optional simplified flight controls, and optional aerial work • Add a statement concerning acceptable aerial work operations • Revise statement(s) to remove references to 14 CFR definition of light-sport aircraft and include new statements required by this rule • Include new requirements of § 21.190(f)(3), (4), and (5) for an amended statement of compliance • Update the certifying statement field to add training/certification credentials for the person signing the form • Add provision for the manufacturer of light-sport category aircraft to notify FAA and owners of aircraft it manufactured in advance of discontinuance of its continued operational safety program or transfer of its execution to another responsible party
2120-0022	FAA Form 8610-3, Airman Certificate and/or Rating Application – Repairman: • Change the certificate title from repairman certificate (light-sport aircraft) to repairman certificate (light-sport) • Use the term "Aircraft Category" in place of "LSA Class" and list the following aircraft categories: airplane, rotorcraft, glider, lighter-than-air, powered-lift, powered parachute, and weight-shift-control aircraft
2120-0690	FAA Form 8710-11, Airman Certificate and/or Rating Application (previously part of OMB Control Number 2120-0690): • Update the "Application Information" field to accommodate any aircraft class, and to specify whether the aircraft meets requirements for simplified flight controls • Update the "Record of Pilot Flight Time" field to accommodate any aircraft class
2120-0730	14 CFR 91.417, Maintenance Records - SLSA Safety Directive Recording: • Cancelled (compliance no longer mandatory)

Public Comments: FAA received three comments concerning FAA Form 8130-6, no comments concerning FAA Form 8130-15, one comment concerning FAA Form 8610-3, no comments concerning FAA Form 8710-11, and no comments concerning § 91.417.

Air Tractor, Inc., NAAA, and GAMA asked which uses and special purpose operations may be selected when applying for a special airworthiness certificate for restricted category aircraft. They also asked about the basis for determining eligibility for special purpose operations.

FAA notes that, per § 21.185, FAA issues an airworthiness certificate for restricted category aircraft for aircraft that were type certificated in the restricted category and that, per § 21.25(a), FAA issues "a type certificate for an aircraft in the restricted category for special purpose operations." That is, FAA Form 8130-6 merely reflects the requirements of these regulations. The revised form includes the uses and special purpose operations included in the NPRM and an applicant may select all uses and special purpose operations included on the applicable type certificate, including any design changes approved per subpart D of part 21.

As with any application for issuance of an airworthiness certificate, it is incumbent on the applicant to provide evidence of compliance with applicable requirements, including, in this case, eligibility issuance of a special airworthiness certificate for a restricted category aircraft for the special purpose operation under the applicable type certificate. FAA has responsibility for reviewing all such records and inspecting the aircraft to verify that the applicant met applicable requirements and the aircraft is airworthy.

One commenter asked if there will be changes to FAA Form 8610-3 related to the repairman certificate (light-sport) changes. As discussed in the NPRM, changes will be made to FAA Form 8610-3, which is a part of information collection 2120-0022, through the OMB approval process.

The revisions to the information collection instruments (i.e., forms) related to this rulemaking do not result in changes to the current OMB approved burden estimates in the affected collections.

Respondents (including number of): No change.

Frequency: No change.

Annual Burden Estimate: Changes to these forms, including those related to the dispositions of public comments, have no impacts on the burden estimates for paperwork burden for these collections.

F. International Compatibility

In keeping with U.S. obligations under the Convention on International Civil Aviation (Chicago Convention), it is FAA policy to conform to International Civil Aviation Organization (ICAO) standards and recommended practices to the maximum extent practicable. In the event this final rule differs with ICAO standards, the United States can address this issue with ICAO.

FAA notes that multiple aviation authorities have established provisions for the certification of light-sport category aircraft. Requirements among these authorities share similarities for enabling the certification of small aircraft for recreation. However, the specific eligibility parameters for certification as light-sport category aircraft; design, performance, and production requirements; and certification procedures are not harmonized among these authorities. FAA understands that EASA requires the use of the

noise standards in Annex 16 Volume I of the Chicago Convention. This rule would not require the use of Annex 16 Volume I for these aircraft. Regardless of differences among national civil aviation authorities for the certification of light-sport category aircraft, the final rule generally aligns with recent rulemaking in Brazil and the European Community in enabling increased safety and performance of these aircraft.

This final rule will enable specialty air services conducted pursuant to the United States-Mexico-Canada Agreement (USMCA). As required by the Chicago Convention Annex 2, persons conducting specialty air services must comply with the pertinent regulations of both their country of origin and the country in which they are operating.[339] When there is a variance in regulation between the two countries, the more stringent set of regulations controls the specialty air service operation.[340] By reducing the burden that the United States imposes on certain aerial work operations, this rule will enable specialty air services by reducing instances in which more stringent United States regulations impose undue costs on services.

G. Environmental Analysis

The National Environmental Policy Act of 1969 (NEPA), as amended (42 U.S.C. 4321-4336e), requires Federal agencies to consider the environmental impacts of their actions in the decision-making process. NEPA requires Federal agencies to assess the environmental effects of proposed Federal actions prior to making decisions and involve the public in the decision-making process. FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures*, establishes FAA's policies and procedures for the evaluation of environmental impacts under NEPA.[341] An environmental assessment (EA) is prepared for an action for which a categorical exclusion is not applicable and is either unlikely to have significant effects or when significance of the action is unknown. The

EA is a concise public document that provides sufficient evidence and analysis to determine whether to prepare an environmental impact statement or a finding of no significant impact (FONSI). The EA describes the proposed action, the purpose and need for the action, the alternatives considered, the environmental impacts of the action and alternatives, and a listing of the preparers and agencies and persons consulted. If, after reviewing the EA and public comments if applicable, in response to a draft EA, an agency determines that a proposed action will not have a significant impact on the human or natural environment, it can conclude the NEPA analysis with a FONSI. A programmatic environmental assessment may be used to assess the environmental effects of a program, policy, plan, or national level proposal that may lead to later individual actions.

FAA prepared a draft Programmatic Environmental Assessment (draft PEA) to analyze and disclose potential environmental impacts for the NPRM consistent with NEPA and FAA Order 1050.1F. The NPRM amends regulations related to the certification and operation of light-sport category aircraft and other aircraft that hold special airworthiness certificates, establishes requirements for airmen who operate and maintain those aircraft, and provides other supporting rules. The proposed rule responds to the evolving needs of the light-sport sector and increases the availability of safe, modern, and affordable aircraft for recreational aviation, flight training, and certain aerial work.

The draft PEA considered the environmental effects of the NPRM and the effects of not issuing the proposed rule (no action alternative). In accordance with FAA Order 1050.1F, the draft PEA analyzed relevant environmental impact categories to the proposed action, including noise and noise-compatible land use, air quality, biological

resources, children's environmental health and safety risks, Department of Transportation Act section 4(f), farmlands, historical and cultural resources, and visual effects. The draft PEA evaluated the significance of environmental effects for each impact category using the significance thresholds and factors to consider from FAA Order 1050.1F. The draft PEA identifies the personnel and contractors involved in its preparation. FAA did not consult with other agencies or persons in preparing the draft PEA. Based on the analyses in the draft PEA, a draft finding of no significant impact (FONSI) was prepared.

FAA provided notice of availability of the draft PEA and draft FONSI for a thirty-day public comment period in the *Federal Register* on May 27, 2025.[342] The draft PEA and draft FONSI were posted to the docket for this rulemaking at FAA-2023-1377. After reviewing comments submitted on the draft PEA and draft FONSI, FAA prepared a final PEA, which is provided in the regulatory docket. The final PEA includes revisions to the analysis of noise effects to account for the change in the final rule to not require noise certification of aircraft that do not conform to a type certificate and to allow voluntary compliance with part 36 for non-type certificated aircraft.

1. Comments on Notice of Proposed Rulemaking – Noise and Environmental

The comments submitted on the NPRM focused on noise, air emissions, and other environmental effects.

a. Noise Effects

Several commenters expressed concern about the impacts of aviation noise, though many of the comments were general in nature and not specifically in reference to the aircraft types covered by the NPRM. One commenter noted GA noise is damaging to humans. Another commenter submitted multiple comments discussing the possible impacts of aviation noise on human health and well-being, including concerns about

flight training schools. One person stated FAA's data already shows a substantial increase in the percentage of people who are highly annoyed by aircraft noise over the range of aircraft noise levels considered, including at lower noise levels.

A few commenters focused on the MOSAIC rulemaking provisions and discussed whether implementation of the final rule might result in increased aviation noise levels, though these commenters said they could not easily draw conclusions based on the information in the NPRM. Concerned Residents of Palo Alto, AICA, and Groton Ayer Buzz commented that current high-performance aircraft are exceedingly loud. Groton Ayer Buzz noted communities have concerns about the expansion of privileges listed in the proposed rule and whether this could result in more aviation noise. The provisions mentioned include the proposed expansions to certain sport pilot privileges through training and endorsements for aircraft under MOSAIC, and to conduct night operations, in addition to the proposed changes to regulations affecting the privileges and limitations of a flight instructor certificate with a sport pilot rating.

AICA and Concerned Residents of Palo Alto commented that GA-impacted communities would find the noise impacts of the NPRM difficult to determine and insufficient information was shared in the NPRM. AICA stated the communities find the part 36 noise limits difficult to understand. Concerned Residents of Palo Alto, Groton Ayer Buzz, and AICA expressed concern that the proposed rule increases operating privileges for recreational pilots, which would further impact their communities already impacted by GA operations. Concerned Residents of Palo Alto also commented that FAA's current noise policy is inadequate and does not reflect the actual impacts experienced by residents and the NPRM similarly does not adequately disclose impacts.

On the other hand, some commenters stated the NPRM is likely to result in reduced noise levels in the NAS. One commenter stated using LSA would help solve the noise problem at a local municipal airport. Another commenter noted the use of LSA for glider towing under the NPRM would result in less noise emissions because most of the current towplane fleet are older, louder aircraft repurposed from crop-dusting roles. One person stated most LSA are powered by quieter engines.

In response to public comments about aviation noise impacts that are beyond the scope of the MOSAIC rulemaking, FAA acknowledges that aviation noise effects are widespread, and noise can impact human health and well-being. FAA maintains a range of programs and initiatives to reduce the impacts from aviation noise emissions, including the promotion and certification of noise-reducing technologies on aircraft, the abatement of high noise levels at noise-sensitive properties around certain airports, and continued implementation of the Noise Complaint Initiative and noise portal. In addition, as mentioned by a few commenters, FAA is currently considering updating its civil aircraft noise policy through the NPR.

In response to public comments that focused on the NPRM provisions, including the expanded LSA pilot privileges, FAA highlights that light-sport category aircraft make up approximately one percent of the overall GA fleet in the U.S. While FAA has not measured LSA for noise certification, commenters have provided supporting data that shows LSA typically generate lower noise levels than most other GA aircraft. FAA also reiterates that the final MOSAIC rulemaking will enable the safe implementation of technologies that could reduce noise emissions further, including noise-abatement equipment and electric-propulsion systems.

To help address some of the in-scope noise comments, including statements that the noise impacts of the NPRM are difficult to determine based on the NPRM, FAA prepared a Programmatic Environmental Assessment (PEA) analyzing the potential effects to the environment that may result from implementation of the MOSAIC final rule. FAA considered the potential for noise impacts based on the increased operating privileges for LSA pilots, the removal of the LSA definition, and other provisions in the rulemaking that could result in increased noise levels at noise-sensitive properties such as residential, educational, health, and religious structures. Based on the results of the PEA and the associated noise and air emissions technical studies, FAA determined that implementation of the MOSAIC rule provisions would not result in significant environmental impacts.

b. Air Emissions Effects

Two commenters raised concerns about air emissions from aircraft, though not specifically regarding the types of aircraft and regulatory provisions covered by the NPRM. The individual commenters mentioned lead (Pb) as the primary concern, as some GA aircraft use leaded fuel. One commenter stated lead and many other aviation pollutants cause adverse health impacts and reduce educational attainment. The commenter expressed further concerns with exposure to lead and other air pollutants resulting in impacts to health, human development, and behavior. Another commenter noted FAA has not addressed lead pollution as aviation operations have greatly increased.

In contrast, other commenters stated the proposed MOSAIC provisions would have a positive effect on air quality, since the rulemaking would enable the adoption of more efficient technologies and modern equipment. One commenter stated the adoption of experimental-grade fuel-injection systems would result in benefits such as cleaner fuel

burn and reduced fuel consumption that would benefit the environment and society. Another commenter stated the proposed MOSAIC provision for glider towing will displace the existing towplane fleet that are much older and generate lead pollution. The commenter noted the use of LSA for glider towing in Europe has proven to be a beneficial solution for many soaring groups there and advances in electric propulsion will lead to LSA operations that do not utilize aviation fuel.

In response to comments about air emissions, FAA acknowledges aircraft emissions can result in environmental impacts around the NAS, including from the use of leaded fuel. The MOSAIC PEA investigated whether promulgation of the rule has the potential to cause or contribute to any exceedance of emissions of six criteria pollutants covered under the Clean Air Act's National Ambient Air Quality Standards (NAAQS), including lead. Based on the results of the PEA and associated technical reports, FAA determined that implementation of the final rule would not violate air quality standards and would not result in any significant impacts to air quality, water quality, or ground resources.

Regarding lead emissions specifically, it is important to note that FAA, the Environmental Protection Agency (EPA), and industry are implementing ongoing programs to find a safe replacement for leaded fuel, including the Eliminate Aviation Gasoline Lead Emissions (EAGLE) Initiative and the Piston Aviation Fuel Initiative (PAFI), with the aim of eliminating leaded fuel across the NAS by 2030. FAA also notes that many current LSA are powered by Rotax engines that do not use leaded fuel, and the rule may facilitate other lead-free technologies, such as the development of battery-powered electric aircraft.

c. Other Environmental Comments

Two individual commenters raised concerns about the potential for adverse impacts to wildlife, though not specifically regarding the NPRM. One commenter urged that any increase in aircraft operations should not be considered and that GA aircraft noise is damaging to humans and wildlife. Another commenter stated a helicopter flight training school has the potential to harm trees, birds, wildlife, and humans. While referencing potential impacts to wildlife that could result from various aviation activities, the commenter did not mention LSA or the specific provisions or activities covered by the NPRM.

In response to comments expressing concern with negative impacts to wildlife, FAA emphasizes this rule does not authorize the harassment, harming, or killing of birds, mammals, or ocean-dwelling animals. These types of actions are prohibited by other laws and regulations such as the Migratory Bird Treaty Act (see 16 U.S.C. 703; 50 CFR part 21), the Endangered Species Act (ESA), and the Marine Mammal Protection Act (MMPA). FAA emphasizes that in addition to satisfying the provisions of this rule, LSA pilots will remain subject to all applicable laws, including environmental and wildlife laws. In addition, because the rule covers only a small subset of the overall GA fleet (light-sport category aircraft represent approximately one percent), and because any future growth in LSA operations and fleet size will occur gradually, incrementally, and dispersed across the NAS, FAA determined that implementation of this final rule would have no effect on wildlife populations.

2. Comments on Draft Programmatic Environmental Assessment

One comment was received on the draft PEA and draft FONSI. The comment recommended increasing the clean stall speed from 54 knots to 55 knots to allow the inclusion of Cessna C177 aircraft produced between 1968 and 1978. This comment does

not expressly identify environmental effects. The draft PEA and supporting analysis evaluated noise effects using the maximum stall speed that is adopted in the final rule. The revised noise analysis in the final PEA also uses the maximum stall speed that is adopted in the final rule. As described in the draft PEA and the final PEA, there are no significant noise effects associated with the issuance of the MOSAIC rule or its implementation.

3. Finding of No Significant Impact

Based on FAA's analysis of the MOSAIC rule provisions as described in the final PEA, FAA finds that codification and implementation of this rule will not result in a significant impact to the human environment. A copy of the Finding of No Significant Impact is provided in the regulatory docket.

H. Regulations Affecting Intrastate Aviation in Alaska

Section 1205 of the FAA Reauthorization Act of 1996 (110 Stat. 3213) requires the Administrator, when modifying 14 CFR regulations in a manner affecting intrastate aviation in Alaska, to consider the extent to which Alaska is not served by transportation modes other than aviation, and to establish appropriate regulatory distinctions.

Because this final rule will apply to issuance of airworthiness certificates for restricted category aircraft, light-sport category aircraft, and certain experimental aircraft; operating limitations for restricted category aircraft, light-sport category aircraft, and experimental aircraft; and sport pilot limitations and privileges, it could affect intrastate aviation in Alaska once adopted. This rulemaking generally expands privileges for small aircraft with special airworthiness certificates. Small aircraft are important to the economy of Alaska, and FAA anticipates this rule will make small aircraft more readily available to private consumers and small businesses. This rulemaking also codifies

special operating purposes for restricted category aircraft that are specific to operations in Alaska, simplifying the issuance of type, production, and airworthiness certificates for those aircraft. Therefore, FAA believes this regulation will have a generally positive impact on aviation in Alaska.

VI. Executive Order Determinations

A. Executive Order 13132, Federalism

FAA has analyzed this final rule under the principles and criteria of Executive Order 13132, Federalism. FAA has determined this action will not have a substantial direct effect on the States, or the relationship between the Federal Government and the States, or on the distribution of power and responsibilities among the various levels of government, and, therefore, will not have federalism implications.

B. Executive Order 13175, Consultation and Coordination with Indian Tribal Governments

Consistent with Executive Order 13175, Consultation and Coordination with Indian Tribal Governments,[343] and FAA Order 1210.20, American Indian and Alaska Native Tribal Consultation Policy and Procedures,[344] FAA ensures that Federally Recognized Tribes (Tribes) are given the opportunity to provide meaningful and timely input regarding proposed Federal actions that have the potential to have substantial direct effects on one or more Indian tribes, on the relationship between the Federal government and Indian tribes, or on the distribution of power and responsibilities between the Federal government and Indian tribes; or to affect uniquely or significantly their respective Tribes. At this point, FAA has not identified any unique or significant effects, environmental or otherwise, on tribes resulting from this final rule.

C. Executive Order 13211, Regulations that Significantly Affect Energy Supply, Distribution, or Use

FAA analyzed this final rule under Executive Order 13211, Actions Concerning Regulations that Significantly Affect Energy Supply, Distribution, or Use (May 18, 2001). FAA has determined that it is not a "significant energy action" under the executive order and is not likely to have a significant adverse effect on the supply, distribution, or use of energy.

D. Executive Order 13609, Promoting International Regulatory Cooperation

Executive Order 13609, Promoting International Regulatory Cooperation, promotes international regulatory cooperation to meet shared challenges involving health, safety, labor, security, environmental, and other issues and to reduce, eliminate, or prevent unnecessary differences in regulatory requirements. FAA has analyzed this action under the policies and agency responsibilities of Executive Order 13609 and has determined this action will have no effect on international regulatory cooperation.

VII. Additional Information

A. Electronic Access and Filing

A copy of the NPRM, all comments received, this final rule, and all background material may be viewed online at https://www.regulations.gov using the docket number listed above. A copy of this final rule will be placed in the docket. Electronic retrieval help and guidelines are available on the website. It is available 24 hours each day, 365 days each year. An electronic copy of this document may also be downloaded from the Office of the Federal Register's website at https://www.federalregister.gov and the Government Publishing Office's website at https://www.govinfo.gov. A copy may also be found at FAA's Regulations and Policies website at www.faa.gov/regulations_policies.

Copies may also be obtained by sending a request to the Federal Aviation Administration, Office of Rulemaking, ARM-1, 800 Independence Avenue S.W., Washington, D.C. 20591, or by calling (202) 267-9677. Commenters must identify the docket or notice number of this rulemaking.

All documents FAA considered in developing this final rule, including economic analyses and technical reports, may be accessed in the electronic docket for this rulemaking.

B. Incorporation by Reference Material

Approved incorporation by reference material may be viewed online at https://www.faa.gov/training_testing. For further information, contact the Training and Certification Group at 202-267-1100, acsptsinquiries@faa.gov, or 800 Independence Ave. S.W., Washington D.C. 20591.

C. Small Business Regulatory Enforcement Fairness Act

The Small Business Regulatory Enforcement Fairness Act (SBREFA) of 1996 requires FAA to comply with small entity requests for information or advice about compliance with statutes and regulations within its jurisdiction. A small entity with questions regarding this document may contact its local FAA official, or the person listed under the **FOR FURTHER INFORMATION CONTACT** heading at the beginning of the preamble. To find out more about SBREFA on the Internet, visit www.faa.gov/regulations_policies/rulemaking/sbre_act/.

Endnotes

[1] Light aircraft fatal accident trends are included on the docket at FAA-2023-1377.
[2] See, e.g., NPRM, *Revision of Airworthiness Standards for Normal, Utility, Acrobatic, and Commuter Category Airplanes*, 81 FR 13452 (Mar. 14, 2016) ("The FAA's safety continuum philosophy is that one level of safety may not be appropriate for all aviation. FAA accepts higher levels of risk, with correspondingly fewer requirements for the demonstration of compliance, when aircraft are used for personal transportation.").
[3] 81 FR 13463 (Mar 14, 2016).
[4] NPRM, *Modernization of Special Airworthiness Certification*, 88 FR 47651 (Jul. 24, 2023).
[5] Light aircraft fatal accident trends are included on the docket at FAA-2023-1377.
[6] The FAA roadmap can be found at: https://www.faa.gov/sites/faa.gov/files/aircraft/air_cert/design_approvals/small_airplanes/roadmapGAAgingAirplane.pdf.
[7] General Aviation (Tables 28-31); available at https://www.faa.gov/data_research/aviation/aerospace_forecasts.
[8] See 88 FR 47653 (Jul. 24, 2023).
[9] Comment from AEA/ARSA, FAA-2023-1377-1238 at 2.
[10] See Direct final rule, *Changes to the Definition of Certain Light-Sport Aircraft*, 72 FR 19661 (Apr. 19, 2007).
[11] MOSAIC Safety Continuum View 07242023, contained in U.S. DOT/FAA – Supplemental Documents, July 24, 2023, FAA-2023-1377-0002.
[12] Final rule, *Revision of Airworthiness Standards for Normal, Utility, Acrobatic, and Commuter Category Airplanes*, 81 FR 96572 (Dec. 30, 2016).
[13] Cirrus SR10, type certificate data sheet number A00021CH for up to 2 passengers. Tecnam P-Mentor, type certificate data sheet number A00067IB for up to 1 passenger. FAA is the certificating authority for the SR10 and the validating authority for the P-Mentor.
[14] Per 14 CFR 61.315(a) as amended, if you hold a sport pilot certificate, you may act as PIC of a light-sport aircraft, except under the circumstances in 14 CFR 61.315(c).
[15] After the effective date of 14 CFR 21.190 in this rule, gyroplanes will be eligible for airworthiness certification in the light-sport category under 14 CFR 21.190.
[16] Data from 2023 Active Civil Airman Statistics (MS Excel), available at https://www.faa.gov/data_research/aviation_data_statistics/civil_airmen_statistics.
[17] These annual reports are available at: https://www.faa.gov/aircraft/gen_av/light_sport.
[18] Data from FAA's 2022 *Special Light-Sport Category Aircraft Continued Operational Safety Report*.
[19] These limitations are contained 14 CFR 91.327 (occupant and aerial work). 14 CFR 91.327 restricts compensation and hire flights to towing gliders and ultralight vehicles, flight instruction, and aerial work operations.
[20] This rule removes the definition of light-sport aircraft from 14 CFR 1.1 on [INSERT DATE 365 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]. However, the light-sport aircraft requirements in that definition will be moved to 14 CFR 21.181 and continue to apply to aircraft certificated prior to [INSERT DATE 365 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]. The only exception is that the current 14 CFR 1.1 requirement that gyroplane have a fixed-pitch, semi-rigid, teetering, two-blade rotor system was not retained for the reasons discussed in section IV.F.3.g.
[21] Though this rule allows certain light-sport category aircraft to be used in aerial work operations, weight-shift-control aircraft and powered parachutes will be excluded from conducting aerial work operations because of commercial pilot requirements in 14 CFR 61.127 & 61.129. Flight training is not considered an aerial work operation and may be conducted per 14 CFR 91.327.

[22] 14 CFR 23.2005.
[23] 14 CFR 21.24.
[24] Survivable Accident: An accident in which the forces transmitted to the occupant through the seat and restraint system do not exceed the limits of human tolerance to abrupt accelerations. In addition, the structure in the occupant's immediate environment remains substantially intact to the extent that a livable volume is provided for the occupants throughout the crash sequence. Traditionally, whether or not an accident was survivable was based on an accident investigator's *opinion* regarding if the occupants should have survived. Design for crashworthiness places the responsibility on the designer to choose the level of survivability. Source: *Small Airplane Crashworthiness Design Guide*; AGATE-WP3.4-034043-036; Released April 12, 2002; available at https://www.regulations.gov/document/FAA-2015-1621-0019.
[25] See Terrafugia, Incorporated, Exemptions No. 16648, May 12, 2016 and 16648A, May 2, 2018.
[26] Per the FAA Registry as of March 20, 2024, 49 of the 53 primary category aircraft are gyroplanes.
[27] Accident data was from the 2022 *Special Light-Sport Category Continued Operational Safety Report*.
[28] Accident data was from the 2022 *Special Light-Sport Category Continued Operational Safety Report*.
[29] For airplanes designed without lift-enhancing devices such as flaps, $V_{S1} = V_{S0}$.
[30] 14 CFR § 21.24(a)(1)(i).
[31] Final rule, *Primary Category*, 57 FR 41360 (Sept. 9, 1992).
[32] The historical average adult passenger weights were taken from FAA Advisory Circular 120-27A, *Aircraft Weight and Balance Control* (May 14, 1980).
[33] Applicable to operators that are either required to have an approved weight and balance control program under parts 121 and 125 or that choose to use actual or average aircraft, passenger, or baggage weights when operating under part 91K or part 135.
[34] Though not developed for use with light-sport category airplanes, FAA Advisory Circular, AC 120-27F, *Aircraft Weight and Balance Control* (May 6, 2019), uses data derived from the National Health and Nutrition Examination Survey (NHANES), conducted by the Centers for Disease Control (CDC), to obtain a "standard average passenger weights." The data is located at https://www.cdc.gov/nchs/fastats/body-measurements.htm and https://www.cdc.gov/nchs/data/series/sr_03/sr03-046-508.pdffThe standard average passenger weights were obtained in September 2024.
[35] Advisory Circular 120-27F, *Aircraft Weight and Balance Control*, May 6, 2019. Advisory Circular 120-27F states that it would be unsafe for an aircraft operator to use standard average weights in single-engine piston-powered aircraft, multiengine piston-powered aircraft, and turbine-powered single-engine aircraft. Instead, operators of these types of aircraft should obtain and use actual passenger weights (including clothing) when calculating the weight and balance.
[36] Though undefined, the term "legacy aircraft" is commonly used in this context to refer to a type certificated normal category airplane subject to 14 CFR 23 or Civil Airworthiness Regulations (CAR) part 3 airworthiness standards.
[37] A 179.2 pounds difference is obtained by the formula: ((199.8 pounds current male passenger average weight – 160 pounds historical passenger weight) + 5 pounds summer clothing) x 4 passengers.
[38] Avgas weights approximately 6.01 pounds per gallon.
[39] United States accident data based on single reciprocating engine airplanes, available at: https://www.ntsb.gov/safety/StatisticalReviews/Pages/CivilAviationDashboard.aspx.
[40] FAA's *Pilot's Operating Handbook*, FAA-H-8083-25A, is available at: https://drs.faa.gov/browse/OTHER_PS_HANDBOOKS/doctypeDetails?modalOpened=true.
[41] Table 27, Defining Event for Accidents in 2022, US General Aviation (Personal Flying), 2003 – 2022 U.S. Civil Aviation Accident Statistics, https://www.ntsb.gov/safety/Pages/research.aspx. According to the Occurrence Category Definitions, https://www.intlaviationstandards.org/Documents/OccurrenceCategoryDefinitions.pdf, in-flight turbulence encounter could include clear air, mountain wave, mechanical, and/or cloud-associated turbulence; wake vortex encounters; and turbulence encountered by aircraft when operating around or at buildings, structures, and objects.

[42] *Airworthiness Standards: Normal, Utility, and Acrobatic Category Airplanes [New],* 29 FR 17955 (Dec. 18, 1964).
[43] Though FAA did not propose any crashworthiness requirements in this rule, FAA encourages consensus standards organizations for light-sport category airplanes to consider consensus standards like those in ASTM Standard F3083/F3083M-20A as a means to mitigate the increased kinetic energy of the 61 knot CAS V_{S0} in emergency landing conditions.
[44] For gliders designed without lift-enhancing devices such as flaps, $V_{S1} = V_{S0}$.
[45] CS-22 can be found at https://www.easa.europa.eu/en/document-library/certification-specifications/group/cs-22-sailplanes-and-powered-sailplanes#cs-22-sailplanes-and-powered-sailplanes.
[46] TCCA's Chapter 522 Subchapter B is available at: https://tc.canada.ca/en/corporate-services/acts-regulations/list-regulations/canadian-aviation-regulations-sor-96-433/standards/airworthiness-manual-chapter-522-gliders-powered-gliders/airworthiness-manual-chapter-522-subchapter-b-flight-canadian-aviation-regulations-cars#522_45.
[47] 45 knots = 83.34 km/h and 90 km/h = 48.6 knots.
[48] The V_{S1} limitation in this rule only applies to weight-shift-control aircraft.
[49] These lift-enhancing devices would be considered major alterations because they may appreciably affect the weight, balance, structural strength, performance, flight characteristics, or other qualities affecting airworthiness.
[50] Any stall speed changes as a result of a major alteration, approved by the manufacturer or a third party acceptable to FAA, will be provided in revised POH documentation that accompanies the alteration.
[51] FAA Aviation Safety, Special Airworthiness Information Bulletin 2024-07, *Stall Warning System, Angle of Attack Alerting Systems*, December 26, 2024; available at https://drs.faa.gov/browse/excelExternalWindow/DRSDOCID1170710096202412262142 36.0001.
[52] DOT/FAA/TC-TN19/11, "A Review of Angle-of-Attack Display Research from 1958-2014," October 2019, available at: https://rosap.ntl.bts.gov/view/dot/57876.
[53] NTSB's U.S. Civil Aviation Accident Dashboard: 2008 – 2022, available at https://www.ntsb.gov/safety/StatisticalReviews/Pages/CivilAviationDashboard.aspx.
[54] AC 43.13-1, *Acceptable Methods, Techniques, and Practices—Aircraft Inspection and Repair*, and 43.13-2, *Acceptable Methods, Techniques, and Practices—Aircraft Alterations*, available at: https://www.faa.gov/regulations_policies/advisory_circulars/.
[55] Definitions from Merriam-Webster dictionary; available at https://www.merriam-webster.com (last accessed 4 December 2024).
[56] Summarized from FAA's *Airplane Flying Handbook*, FAA-H-8083-3C, available at https://www.faa.gov/regulations_policies/handbooks_manuals/aviation/airplane_handbook.
[57] Applicable to light-sport category aircraft certificated prior to § 21.190 and part 22 in this final rule becoming effective.
[58] FAA Order 8130.2K, *Airworthiness Certification of Aircraft*.
[59] Proposed 14 CFR 22.180(a) in the NPRM was written as, "The aircraft allows the pilot to only control the flight path of the aircraft or intervene in its operation without direct manipulation of individual aircraft control surfaces or adjustment of the available power."
[60] Consensus standards for fixed and ground-adjustable propellers exist in ASTM Standard F2506-13, *Design and Testing of Fixed-Pitch or Ground Adjustable Propellers.*
[61] ASTM Standard F2245, ASTM Standard F2506, ASTM Standard F2746, ASTM Standard F2483, *Standard Practice for Maintenance and the Development of Maintenance Manuals for Light Sport Aircraft*, and ASTM Standard F3198, *Standard Specification for Light Sport Aircraft Manufacturer's Continued Operational Safety (COS) Program*.
[62] *Issuance of final airworthiness criteria, Airworthiness Criteria: Primary Category Airworthiness Design Criteria for the ICON Aircraft Inc., Model A5-8 Airplane*, 88 FR 83019 (Nov. 28, 2023).
[63] Per § 21.17(f) requirements for type certification of a primary category aircraft.
[64]14 CFR 61.321.

[65]14 CFR 61.413, 61.415. Conversely, a subpart H flight instructor may provide training and endorsements in pursuit of any pilot certificate.
[66]FAA notes new 14 CFR 61.315(c)(21) adopted in this final rule, as discussed in section IV.H.8.g of this preamble; however, this provision simply clarifies an existing limitation rather than making a change to an existing privilege or limitation.
[67] These requirements are currently set forth in paragraphs (10), (9), and (13) respectively, under the 14 CFR 1.1 light-sport aircraft definition.
[68] See section IV.E. of this preamble for additional discussion on FAA's approach to light-sport category aircraft certification.
[69] See 14 CFR 61.321.
[70] See 14 CFR 61.331 & 61.329.
[71] See 14 CFR 61.31(e) & (f).
[72] 88 FR 47682 (Jul. 24, 2023).
[73] Final rule, *Public Aircraft Logging of Flight Time, Training in Certain Aircraft Holding Special Airworthiness Certificates, and Flight Instructor Privileges*, 89 FR 80310 (Oct. 2, 2024).
[74] 14 CFR 61.315(c)(4).
[75] See FAA Order 2150.3C, *FAA Compliance and Enforcement Program*.
[76] See Final rule, *Certification of Aircraft and Airmen for the Operation of Light-Sport Aircraft*, 69 FR 44772 (Jul. 27, 2004).
[77] See section IV.H.4 of this preamble for further discussion on the operation of helicopters with simplified flight controls under this rulemaking.
[78]See discussion at IV.G.5.
[79] 88 FR 47683 (Jul. 24, 2023). FAA notes that the 14 CFR 61.316(h) reference in this NPRM section was a typographical error, and the correct subsection reference in the NPRM was 14 CFR 61.316(a)(7).
[80] In 14 CFR 61.1 Definitions, "Set of aircraft" means aircraft that share similar performance characteristics, such as similar airspeed and altitude operating envelopes, similar handling characteristics, and the same number and type of propulsion systems.
[81] See Docket ID: FAA-2023-1377, FAA's Office of Accident Investigation & Prevention (AVP), *Analytical Summary of VS1 Stall Related Accident Rates in Support of the Modernization of Special Airworthiness Certification Rule* (Apr. 29, 2024). AVP's analysis is published on the docket in tandem with this final rule.
[82] V_A means design maneuvering speed. See 14 CFR 1.2.
[83] 57 FR 41360 (Sept. 9, 1992).
[84] See https://www.ntsb.gov/safety/StatisticalReviews/Pages/CivilAviationDashboard.aspx and https://www.faa.gov/newsroom/general-aviation-safety. NTSB and FAA actively track accidents for all pilots; collect data; provide a detailed analysis to determine the cause of those accidents; determine whether regulatory and policy changes are needed to support safety in the NAS; and make that information available to the public.
[85] Calibrated airspeed (CAS) is indicated airspeed corrected for instrument and position error. *Pilot's Handbook of Aeronautical Knowledge (PHAK) Glossary* (faa.gov).
[86] 88 FR 47657.
[87] 14 CFR 61.315(c)(11).
[88] 14 CFR 91.211(a).
[89] 69 FR 44772 (Jul. 27, 2004).
[90] NPRM, *Certification of Aircraft and Airmen for the Operation of Light-Sport Aircraft; Modifications to Rules for Sport Pilots and Flight Instructors with a Sport Pilot Rating*, 73 FR 20181 at 20188 (Apr. 15, 2008*). Final Rule, Certification of Aircraft and Airmen for the Operation of Light-Sport Aircraft; Modifications to Rules for Sport Pilots and Flight Instructors with a Sport Pilot Rating*, 75 FR 5209 (Feb. 1, 2010).
[91] FAA guidance recommends pilots to consider using oxygen whenever they are operating above 10,000 feet MSL. See FAA Aeronautical Information Manual (AIM) Chapter 8 Section 1. Fitness for Flight, Effects of Altitude 8-1-2 a.5.

[92] See FAA-S-8081-29A, *Sport Pilot and Sport Pilot Flight Instructor Rating Practical Test Standards for Airplane Category, Gyroplane Category, and Glider Category*, I. Area of Operation: Preflight Preparation, Task G: Aeromedical Factors (ASEL and ASES), (Nov. 2023).
[93] See FAA-S-ACS-6C, *Private Pilot for Airplane Category Airman Certification Standards*, Area of Operation I. Preflight Preparation, Task H: Human Factors, (Nov. 2023).
[94] 14 CFR 61.3(e)(2) through (4) address when a pilot holds an ATP and the requirements for a glider and airship.
[95] See 14 CFR 61.93(a). 14 CFR 61.93(b) contains exceptions to this requirement.
[96] 14 CFR 61.93(e)(8), (f)(8), (g)(8), (h)(8), (i)(8), (j)(8), (k)(8), (l)(8), and (m)(8).
[97] 14 CFR 61.93(e)(12).
[98] A person is not required to meet the training and endorsement requirements to operate an airplane with a V_H of less than or equal to 87 knots CAS as set forth in 14 CFR 61.327(a) if the person logged flight time as PIC of an airplane with a V_H less than or equal to 87 knots CAS prior to April 2, 2010.
[99] 14 CFR 61.65(a).
[100] *Private Pilot for Airplane Category ACS*, FAA-S-ACS-6C (November 2023), Area of Operation VIII. Basic Instrument Maneuvers. FAA notes that these minimum requirements continue to apply when an applicant concurrently applies for a private pilot certificate with the associated instrument rating.
[101] Aerial work is discussed further in section IV.K.1.a, Operations, Operating Limitations for Light-Sport Category Aircraft, Aerial Work of this rule.
[102] See 14 CFR 119.1(e) and Final Rule, *Public Aircraft Logging of Flight Time, Training in Certain Aircraft Holding Special Airworthiness Certificates, and Flight Instructor Privileges*, 89 FR 80310 (Dec. 2, 2024).
[103] FAA recognizes that compensation for flight training is also not specifically enumerated in the subpart H flight instructor requirements; however, subpart H flight instructors are required to have an underlying commercial pilot certificate or an ATP certificate with an aircraft category and class rating appropriate to the flight instructor rating sought for subpart H flight instructor certificate eligibility (§ 61.183). Both a commercial pilot certificate and an ATP certificate facilitate operations for compensation or hire.
[104] Unlike the underlying commercial pilot certificate and ATP certificate that facilitate operations for compensation or hire for a subpart H instructor, the underlying sport pilot certificate specifically restricts compensation and hire. Therefore, FAA finds it necessary to except the restrictions from § 61.413(d).
[105] 69 FR 44792 (Jul. 27, 2004).
[106] I.e., pilots trained and endorsed in accordance with proposed 14 CFR 61.331.
[107] FAA notes that ground resonance is addressed in the helicopter simplified controls and PTS for sport pilots. However, FAA notes that helicopters tend to have more stability than gyroplanes and have the ability to timely correct for imbalances that three-blade gyroplanes may not be able to.
[108] 14 CFR 1.1 defines "night" as the time between the end of evening civil twilight and the beginning of morning civil twilight, as published in the Air Almanac, converted to local time.
[109] To qualify for BasicMed, a person must have held a FAA medical certificate after July 14, 2006, must hold a valid U.S. driver's license, and must also comply with any restrictions associated with that US issued driver's license. 14 CFR 61.23(c)(3). BasicMed qualification requirements include completion of online training course every two years and a physical examination with a state licensed physician every four years.
[110] See Advisory Circular (AC) 68-1A, *BasicMed*.
[111] E.g., 14 CFR 61.109.
[112] FAA notes that the night currency requirements specified in 14 CFR 61.57(b) will continue to be applicable for all pilots.
[113] Final rule, *Airman Certification Standards and Practical Test Standards for Airmen; Incorporation by Reference,* 89 FR 22503 (Apr. 1, 2024).
[114] 14 CFR 61.109.
[115] FAA notes that this section primarily discusses medical certificates in the context of third-class, as this is the lowest "grade" of medical certificate in part 67 and FAA did not receive comment on first- or second-class medical considerations.

[116] One commenter generally asserted that operating in a glider can be done safely without a medical certificate. FAA agrees and affirms there is currently no requirement to possess a FAA medical to operate a glider.
[117] FAA has an up-to-date listing of Aviation Medical Examiners searchable on its website, https://www.faa.gov/pilots/amelocator.
[118] BasicMed requires the pilot to have held a medical certificate issued under part 67 at any point since July 14, 2006.
[119] See *Guide for Aviation Medical Examiners*, updated 01/01/2025, https://www.faa.gov/ame_guide/media/ame_guide.pdf.
[120] Final Rule, *Alternative Pilot Physical Examination and Education Requirements*, 82 FR 3149 (Jan. 11, 2017).
[121] See Section IV.H.1.j.iv for a discussion of medical conditions and risk to night operations.
[122] See *Pilot's Handbook of Aeronautical Knowledge*, chapters 13 and 17 for more information about how medical deficiencies affect night vision.
www.faa.gov/regulations_policies/handbooks_manuals/aviation/phak.
[123] 14 CFR 61.23(c)(3)(i)(B).
[124] Congress mandated the regulatory framework of Basic Med in the *FAA Extension, Safety, and Security Act of 2016*, Pub. L. 114-190, July 15, 2016, section 2307. Congress amended these requirements in the *FAA Reauthorization Act of 2024*, Pub. L. 118-63, May 16, 2024, sections 815 and 828.
[125] For example, a private pilot who is exercising the privileges of a sport pilot certificate would be subject to the restriction of carrying one passenger pursuant to 14 CFR 61.315(c)(4).
[126] See 14 CFR 67.403 & 61.59, which address and restrict falsification, reproduction, alteration, and incorrect statements on applications, certificates, logbooks, reports, or records.
[127] Medical certificate deferral does not, in and of itself, disqualify an airman from meeting BasicMed requirements. See 14 CFR 61.23(c)(3).
[128] As stated in the NPRM, proposed § 61.316 would permit sport pilots to fly an airplane with a fixed or ground-adjustable propeller, but also allow those with an automated controllable-pitch propeller. See 88 FR 47661. FAA notes an inadvertent typographic error on that *Federal Register* page by citing to 14 CFR 61.316(e) instead of 14 CFR 61.316(a)(4).
[129] Hartzell Propellers provided a comment stating that the final rule should not limit the use of propeller automation. This final rule clarification responds to Hartzell's comment.
[130] See 14 CFR 1.1 (2004).
[131] See, e.g., Exemption No. 8823, issued January 17, 2007.
[132] 72 FR 19661 (Apr. 19, 2007).
[133] See section IV.C for discussion on retractable landing gear on an aircraft intended for operation on water.
[134] As described in section IV.H.4., FAA re-numbered 14 CFR 61.316(a) as a result of other changes to the proposed language.
[135] As defined in 14 CFR 61.1, a complex airplane means an airplane that has a retractable landing gear, flaps, and a controllable pitch propeller, including airplanes equipped with an engine control system consisting of a digital computer and associated accessories for controlling the engine and propeller, such as a full authority digital engine control; or, in the case of a seaplane, flaps and a controllable pitch propeller, including seaplanes equipped with an engine control system consisting of a digital computer and associated accessories for controlling the engine and propeller, such as a full authority digital engine control.
[136] See 88 FR 47685 (Jul. 24, 2023).
[137] See 72 FR 19661 (Apr. 19, 2007).
[138] See 88 FR 47685 (Jul. 24 2023).
[139] As discussed at length in the NPRM, instructor pilots generally develop and validate training for an aircraft for the manufacturer. Therefore, the duties of an instructor pilot establish intricate knowledge of the aircraft's systems and components, ensuring they are qualified to create the initial cadre of authorized instructors who may provide training under new 14 CFR 61.31(l). 88 FR 47686.
[140] 88 FR 47686 (Jul. 24, 2023).

[141] FAA notes this framework is currently utilized in 14 CFR 61.31 to obtain additional privileges (e.g., operation of tailwheel airplanes, high performance airplanes, etc.).
[142] USUA detailed the necessary regulatory text revisions necessary under this general framework affecting 14 CFR 61.31(l), 61.45(g)(2), 61.195(n)(2), 61.415(m), and 61.429(d); because this final rule does not implement USUA's recommendation, the regulatory text recommendations are summarized for brevity.
[143] See 69 FR 44772 (Jul. 27, 2004); 75 FR 5204 (Feb. 1, 2010).
[144] 14 CFR 61.31(e) and (f).
[145] 14 CFR 61.45(h)(2).
[146] 88 FR 47687 (Jul. 24, 2023).
[147] This final rule adds the applicability to an initial applicant for that category and class rating to address a potential situation where a person may have two category and class ratings (e.g., airplane single engine and rotorcraft helicopter) and adds a simplified flight controls privilege in one of those category and classes. Under the proposed regulatory text, the FAA identified ambiguity as to whether the person would be required to only receive training and endorsement to add a simplified flight controls privilege in the other category and class because the person would be seeking a different category and class of aircraft with simplified flight controls. Adding the applicability to initial applicants for that category and class rating serve to make clear that a practical test is only required for a different category and class if the person does not already have the base category and class ratings for the aircraft with simplified flight controls.
[148] FAA notes that the regulatory text adopted (as proposed) will contain an exception for the examiner's ability to assume control if the sport pilot practical test is conducted in an aircraft with a single seat. In this instance, 14 CFR 61.45(f) will control in lieu of 14 CFR 61.45(g)(3), only (i.e., 14 CFR 61.45(g)(1) and (2) will still apply).
[149]See 14 CFR 61.429(d).
[150] See Table 1, *Airman Certification Simplified Flight Controls Requirements*, 88 FR 47687 (Jul. 24, 2023).
[151] 88 FR 47688 (Jul. 24, 2023).
[152] In response to a commenter's recommendation that sport pilots should be permitted to operate helicopters with three blade rotors, FAA notes it does not limit the number of rotor blades for rotorcraft-helicopters that sport pilots may operate under this final rule.
[153] FAA recognizes a number of standing operations are inherently inapplicable to helicopters (e.g., soaring techniques); this final rule makes conforming amendments to except helicopters from those areas of operation in redesignated 14 CFR 61.311(g), (j), and (k).
[154]See 14 CFR 61.101(b).
[155] To note, FAA also proposed to permit sport pilot applicants to use a qualified FSTD or a FAA-approved ATD (basic or advanced) to meet some of the experience requirements for a sport pilot certificate. Adoption of that provision is discussed in section IV.H.7. of this preamble and renumbers current § 61.313(a) through (h) as § 61.313(a)(1) through (9).
[156] 88 FR 47690 (Jul. 24, 2023).
[157] FAA notes redesignation of current paragraphs 14 CFR 61.409(f) through (p) due to the addition of new paragraph (f), Hovering maneuvers (applicable only to helicopters).
[158] See 14 CFR 61.101, *Recreational pilot privileges and limitations*.
[159] 89 FR 22482 (May 31, 2024).
[160] FAA notes that the list of ACSs in § 61.14(b) are listed in numerical order by version number; therefore, FAA-S-ACS-26, *Sport Pilot for Helicopter—Simplified Flight Controls Airman Certification Standards*, will be new 14 CFR 61.14(b)(13), which will shift the subsequent numbers by one (i.e., current paragraph (b)(13) will become (b)(14), current paragraph (b)(14) will become (b)(15), current paragraph (b)(15) will become (b)(16)). FAA-S- FAA-S-ACS-31, *Sport Flight Instructor for Helicopter—Simplified Flight Controls Airman Certification Standards*, will be listed as new § 61.14(b)(17).
[161] FAA notes one conforming amendment in both sections; currently, each section only lists "Practical Test Standards" as applicable to sport pilots; because this final rule adopts two Airman Certification Standards, this final rule revises each paragraph to specify the "applicable Practical Test Standard or Airman Certification Standard."

[162] 5 U.S.C. 552(a), which states, "except to the extent that a person has actual or timely notice of the terms thereof, a person may not in any manner be required to resort to, or be adversely affected by, a matter required to be published in the *Federal Register* and not so published. For the purpose of this paragraph, matter reasonably available to the class of persons affected thereby is deemed published in the *Federal Register* when incorporated by reference therein with the approval of the Director of the Federal Register."
[163] 5 U.S.C. 552(a) requires that matter incorporated by reference be "reasonably available" as a condition of its eligibility. Further, 1 CFR 51.5(a)(2) requires that agencies seeking to incorporate material by reference discuss in the preamble of the proposed rule the ways that the material it proposes to incorporate by reference is reasonably available to interested parties and how interested parties can obtain the material.
[164] FAA-S-8081-29A, FAA-S-8081-30A, and FAA-S-8081-31A.
[165] 14 CFR 61.321. Under § 61.321, the person must also receive a logbook endorsement validating they received training on certain aeronautical knowledge and flight proficiency requirements, receive an endorsement certifying they are proficient in the applicable areas of operation and aeronautical knowledge areas, and complete an application. 14 CFR 61.419 contains mirrored requirements for a certificated flight instructor seeking to provide training in an additional category or class of aircraft.
[166] FAA notes, however, that to obtain the initial sport pilot certificate or flight instructor certificate with a sport pilot rating, a person must pass a practical test with an examiner in the category and class of aircraft for the initial privileges for that certificate.
[167] See 88 FR 47691 (Jul. 24, 2023).
[168] See FAA-S-8081-29A, *Sport Pilot and Sport Pilot Flight Instructor Rating Practical Test Standards for Airplane Category, Gyroplane Category and Glider Category*, November 2003 (stating that "[t]he FAA requires that all sport pilot and sport pilot flight instructor practical tests and proficiency checks be conducted in accordance with the appropriate sport pilot practical test standards and the policies set forth in this INTRODUCTION. Applicants must be evaluated in ALL TASKs included in each AREA OF OPERATION of the appropriate practical test standard, unless otherwise noted.").
[169] One commenter explained the number of weight shift control DPEs is limited and that removing that process would make it difficult to obtain a weight shift control privilege. FAA notes that using a proficiency check to add a weight shift control privilege to an existing sport pilot certificate is still permitted under 14 CFR 61.321.
[170] FAA notes one nonsubstantive amendment in 14 CFR 61.307 adopted in this final rule.
14 CFR 61.307(b) requires a logbook endorsement from the authorized instructor who provided flight training on the areas of operation specified in 14 CFR 61.309 and 61.311 in preparation for the practical test, later describing the endorsement as certification that a person meets the applicable aeronautical knowledge and experience requirements. While 14 CFR 61.309 sets forth aeronautical knowledge requirements (as referenced),14 CFR 61.311 sets forth flight proficiency requirements, not aeronautical experience. Therefore, this final rule revises 14 CFR 61.307(b) to correctly reference aeronautical knowledge and flight proficiency, aligning with and accurately describing the cross-referenced sections.
[171] See ARAC *DPEWG Final Recommendation Report* (June 2021), https://www.faa.gov/regulations_policies/rulemaking/committees/documents/media/ARAC%20DPEWG%20Final%20Recommendation%20Report%20June%202021.pdf.
[172] FAA Order 8000.95 (as amended) contains DPE policy, including initial qualification requirements.
[173] NPRM, *Certification of Aircraft and Airmen for the Operation of Light-Sport Aircraft, 67* FR 5368 (Feb. 5, 2002). The NPRM to the 2004 Final Rule explained that the sport pilot certificate would not list aircraft category and class ratings. FAA also noted logbook endorsements that provide sport pilots with additional category and class privileges do not constitute category and class ratings under part 61.
[174] Flight simulation training device includes flight training devices (FTD level 4-7) and full flight simulators (level A-D) as identified under part 60.
[175] 14 CFR 60.7.
[176] 69 FR 44820 (Jul. 27, 2004).
[177] FAA notes that this final rule separates light-sport aircraft certification from sport pilot certification requirements and privileges. In addition, this final rule does modify sport pilot privileges by allowing operation of certain expanded aircraft design and performance characteristics. However, the expanded aircraft characteristics do not inherently make the aircraft permitted under the rule more complex than what

is allowed under the current rule such that a sweeping increase to training hours is required. This final rule accounts for aircraft that may be more advanced by requiring additional training and endorsements when necessary (e.g., night operations). The additional training and endorsements supplement the checks that are already in place on the minimum experience requirements for a sport pilot. Therefore, FAA determined that changes to the baseline minimum experience requirements are unnecessary.

[178] 14 CFR 61.315(c)(19).

[179] For purposes of providing training for a solo cross-country endorsement under 14 CFR 61.93 of this chapter, a safety pilot may possess a flight instructor certificate with an appropriate sport pilot rating and meet the requirements of 14 CFR 61.412 of this chapter. See 14 CFR 91.109(c)(1)(ii).

[180] The *Integration of Powered-Lift* final rule also adopted the requirement for a person who acts as PIC to hold a type rating for that powered-lift. 14 CFR 61.31(a)(3). Final rule, *Integration of Powered-Lift: Pilot Certification and Operations; Miscellaneous Amendments Related to Rotorcraft and Airplanes*, 89 FR 92296 (Nov. 21, 2024).

[181] A discussion related to recreational pilot certificates and helicopters can be found in section IV.H.4.

[182] See 14 CFR 11.63 for information on petitions for rulemaking.

[183] 14 CFR 61.31(a)(2).

[184] NPRM, *Pilot Rating Requirements*, 29 FR 13038 (Sept. 17, 1964). Final rule, *Pilot Rating Requirements*, 30 FR 11903 (Sep. 17, 1965).

[185] See IV.F.7, Maximum Airspeed at Maximum Continuous Power (V_H), in this final rule for discussion on light-sport category aircraft eligibility criteria in 14 CFR 22.100.

[186] Given that the vast majority of light-sport category aircraft operations would occur below 10,000 feet MSL, where 14 CFR 91.117(a) limits airspeed below 250 knots indicated airspeed, the maximum 250 knot CAS limitation is appropriate for the light-sport category and for operation by sport pilots.

[187] For additional discussion, FAA has issued multiple legal interpretations on what constitutes compensation. These legal interpretations are available by searching the legal interpretations database in the FAA *Dynamic Regulatory System* at https://drs.faa.gov/browse/LEGAL_INTERPRETATIONS/doctypeDetails.

[188] See 14 CFR 61.51(f), *Pilot Logbooks*. Logging second-in-command flight time.

[189] See 14 CFR 61.99(b) & 61.109(l).

[190] 88 FR 43693.

[191] See section IV.I.3 of this preamble for discussion on the removal of the 14 CFR 1.1 definition of light-sport aircraft.

[192] https://amsrvs.registry.faa.gov/amsrvs/.

[193] As used with respect to certification of airman, “category” examples include: airplane, rotorcraft, glider, and lighter-than-air. See 14 CFR 1.1.

[194] As used with respect to certification of airman, “class” examples include: single engine; multiengine; land; water; gyroplane; helicopter; airship; and free balloon. See 14 CFR 1.1.

[195] See NPRM, 88 FR 47964 for a chart cataloging ”class” and ”category” changes.

[196] See 88 FR 47695 (Jul. 24, 2023).

[197] See 14 CFR 65.71 for mechanic eligibility requirements.

[198] It is incumbent upon the repairman certificate (light-sport) holders who are not citizens of the U.S. to ensure they remain in compliance with all applicable employment, immigration, or related laws necessary to work in the United States.

[199] FAA Order 8900.1, Volume 5, Chapter 5, Section 6.

[200] 14 CFR 65.107(a)(2)(ii) and 65.107(a)(3)(ii).

[201] Proposed as 14 CFR 65.107(b)(5).

[202] See Advisory Circular 65-32A, *Certification of Repairmen (Light Sport Aircraft)*, Sec. 2, Para. 113.f, on guidance on course test; see also FAA Order 8000.84B, paragraphs 7 and 8 for guidance for accepting training courses prior to this final rule.

[203] FAA requires documentary evidence to allow applicants the ability to provide documents other than a course completion certificate to demonstrate completing the training course and passing the written exam, in the event the course completion certificate is lost or not otherwise available for presentation. Documentary evidence should include the required information in 14 CFR 65.107(e)(3).

[204] Gyroplane privileges are an exception; Refer to section IV.I.8.
[205] 88 FR 47693 (Jul. 24, 2023).
[206] See 88 FR 47650, 47693 (Jul. 24, 2023).
[207] Incorporated by reference in 14 CFR 65.23(a)(3).
[208] The FAA interprets the commenters use of "type of aircraft" to mean category or class of aircraft.
[209] Final rule, *Certification of Aircraft and Airman for the Operation of Light-Sport Aircraft*, 69 FR 44772, 44849 (Jul. 27, 2004).
[210] At the time of this final rule, only the Rotorcraft and Lighter-than-Air categories include classes within the category.
[211] Credit for prior training is discussed in AC 65-32B, Chapter 3.
[212] See 14 CFR 65.95(a).
[213] In accordance with 14 CFR 91.409(c), annual inspections do not apply to all aircraft holding a standard airworthiness certificate.
[214] Current 14 CFR 65.107(a)(3)(ii) requires: (A) 120 hours for airplane privileges, (B) 104 hours for weight-shift-control privileges, (C) 104 hours for powered parachute privileges, (D) 80 hours for lighter than air privileges, and (E) 80 hours for glider privileges.
[215] 14 CFR 65.109(b), as adopted in this final rule defines the privileges of the maintenance rating, which include performing the annual condition inspection on experimental aircraft issued an airworthiness certificate in accordance with 14 CFR 21.191(g), (i), (k), or (l). Section IV.I.10.b. further discusses the adoption (and expansion) of these privileges.
[216] FAA notes that part 65 designation of category aligns with the aircraft category and classes as defined in 14 CFR 1.1 as applicable to airman certification.
[217] Further discussion regarding replacing the maintenance rating prescriptive hours-based training course with a performance-based training standard using the Mechanic ACS is found in 88 FR 47650, 47693 (Jul. 24, 2023).
[218] *Aviation Maintenance Technician Schools*, Interim Final Rule, 87 FR 31391 (May 24, 2022).
[219] See references to course content in 14 CFR 65.107(b)(4), 65.107(c), (d), and (e).
[220] See 88 FR 7650, 47696 (Jul. 24, 2023).
[221] Draft AC 65-32 found in docket, document ID FAA-2023-1377-0002.
[222]67 FR 5368 (Feb. 5, 2002).
[223] See *Aviation Maintenance Technician Schools*, 87 FR 31391, (May 24, 2022).
[224] See *Consolidated Appropriations Act*, 2021, Sec. 135, "Promoting Aviation Regulations for Technical Training" Public Law 116-260, 134 Stat. 1182. (Dec. 27, 2020).
[225] As evidenced by pilot, mechanic, and dispatcher practical test standards (PTS) and airman certification standards (ACS) historically and currently used to define knowledge and skills necessary to be issued one of these certificates.
[226] "Certificated repairmen (light-sport aircraft) would— (1) Meet minimum training and testing requirements, which would ensure that repairmen have the necessary skills to inspect (or maintain) light-sport aircraft and certify that they are safe to fly …," 67 FR 5368, 5374 (Feb. 5, 2002).
[227] "Draft AC 65-32 for MOSAIC NPRM Docket_06-26-23" found in Docket FAA-2023-1377, document folder with Document ID: FAA-2023-1377-0002. No comments were received on the draft AC. AC 65-32B is revised to reflect the final rule and is available at: https://www.faa.gov/regulations_policies/advisory_circulars/, as well as in the rulemaking docket.
[228] AC 65-32B, appendix B, *Maintenance Rating Training Course Content*.
[229] Advisory Circulars provide a method, but not the only method, of compliance a training course provider could use to meet the regulation.
[230] Guidelines and further guidance pertaining to determining "appropriate" training course content may be found in AC 65-32B, Chapter 3.
[231] See section IV.I.7.a of this preamble for further discussion specific to use of "accepted by the FAA."
[232] FAA Order 8000.84, *Procedures to Accept Industry-Developed Training for Light-Sport Repairmen*.
[233] 5 U.S.C. 552, 553.
[234] See *Aviation Maintenance Technician Schools*, 87 FR 31391 (May 24, 2022).
[235] See section IV.I.4.a of this preamble for additional discussion on "appropriate" content.

[236] Glider category training courses must be updated to include content on both unpowered and powered gliders. Refer to adopted 14 CFR 65.107(g) *Delayed Compliance*, and related discussion in section IV.I.5 of this preamble.
[237] 88 FR 47650, 47695 (Jul. 24, 2023).
[238] See 14 CFR 65.85.
[239] See 14 CFR 65.109(c).
[240] The 14 CFR regulations for operation (e.g. part 91), maintenance/inspection (e.g., parts 43 and 91), and airman certification (e.g. part 65), together, provide additional risk mitigation. For example, a light-sport category aircraft may only be operated if inspected at prescribed intervals (per 14 CFR 91.327) and discrepancies repaired (per 14 CFR 91.409). These aircraft must be maintained in accordance with 14 CFR 43.13, and meet additional requirements for inspections, repairs, and alterations (required by 14 CFR 91.327). That work may only be approved for return to service by certificated personnel under part 65, who are able to perform that work properly (per 14 CFR 65.81 or 14 CFR 65.109(c)).
[241] Parts 23, 25, 27, and 29 are examples of regulations that set forth design standards for various categories of aircraft. Part 23 permits using a consensus standard as a means of compliance for meeting the requirements of the part, in § 23.2010.
[242] In comparison, 14 CFR 65.81(a) and (b) contain limitations for mechanic certificate holders that are almost identical to the § 65.109(c) limitations. FAA has no evidence to suggest that these regulations are not producing the intended outcome that certificate holders have the knowledge and skill necessary to satisfactorily perform and approve for return to service work on an aircraft.
[243] Appendix B of AC 65-32 provides an example of using a module system to deliver the maintenance rating training courses.
[244] As an example, a training course provider could offer an independent course on ballistic parachute systems; if the training provided actual work experience (i.e., not just theory), a certificated repairman could complete the additional training offered and, in doing the work satisfactorily, would meet the requirements for adopted § 65.109 and could approve for return to service a ballistic parachute system after performing the specific work.
[245] In reference to how the proposed rule would create pre- and post-final rule training courses, one commenter stated the final rule should explicitly state that training courses approved prior to this rulemaking continue to be sufficient for obtaining a light-sport repairman certificate, and two commenters opined that more than 6 months should be provided for effectivity. FAA trusts this discussion responds to the commenter, as FAA has determined that all pre-final rule training courses, except for glider courses, already meet 14 CFR 65.107(d), as adopted, and no longer need a 6-month delayed effectivity.
[246] Though not considered under the proposed delayed compliance provision, FAA's review of all repairman (light-sport) training courses found the glider-specific inspection rating course also needed a delayed compliance period to update course content to include both powered and unpowered gliders.
[247] While no powered-glider courses exist, FAA found course content separation for glider powerplants was based on a note in guidance materials. FAA is reviewing related guidance materials and intends to update guidance as necessary to align with the regulations adopted in this rulemaking.
[248] See 14 CFR 1.1 definition of class, as applicable to airman certification.
[249] Glider training courses must include content on both unpowered and powered gliders because powerplants are applicable content, consistent with Mechanic ACS Subject Area III., *Powerplant*.
[250] Upon review of FAA guidance materials, FAA found directions to add an expiration date on training courses accepted by the FAA. Expiration dates for courses are not regulatorily supported and therefore are not enforceable and no longer will be added to course acceptances. FAA will review guidance materials and consider amending guidance to address this issue. As such, FAA considers FAA-acceptance of courses to be effective until the course is superseded or otherwise revised.
[251] FAA notes, holders of a repairman (light-sport) certificate with an inspection rating and glider category privileges must still comply with the operating limitations of the glider, issued in accordance with 14 CFR 91.319. These operating limitations require inspections to be performed per the scope and detail of part 43 appendix D, which would include inspecting the powerplants of powered gliders. Similarly, the holder of a repairman certificate (light-sport) with a maintenance rating and glider category privileges must perform inspections in accordance with inspection procedures developed by the manufacturer or a person

acceptable to the FAA, per 14 CFR 91.327(b)(2) and 91.327(c), which would include inspecting and maintaining the powerplants of powered gliders.
[252] FAA Order 8000.84.
[253] The FAA assumes the commenter is referring to exams such as the FAA-administered oral and practical exams required to be taken by applicants for a mechanic certificate under 14 CFR sections 65.75 and 65.79.
[254] See 88 FR 47653 (Jul 24, 2023).
[255] 14 CFR 65.77.
[256] 14 CFR 65.75.
[257] 14 CFR 65.79.
[258] That Notice explained that where the term "accepted by the FAA" is used, it means the item at issue must be submitted to the FAA for review and acceptance before use. Where the term "acceptable to the FAA" is used, it means the item is not normally privy to the FAA's active review and acceptance before its use, though the FAA will exercise its oversight responsibilities.
[259] FAA interprets "appropriate" facilities, equipment, and materials to mean those elements are sufficiently suited to instruct in the content the training course offered. In NPRM footnote 104, an illustration of appropriate equipment is provided.
[260] FAA interprets "appropriately qualified" instructors to mean an instructor is demonstrably qualified to teach the course content. This demonstration may include educational credentials, certifications, or practical experience that aligns with the subject matter that the instructor teaches.
[261] See NPRM, 88 FR 47697.
[262] 69 FR 44799. Prior to this final rule, 14 CFR 21.190 specifically excluded gyroplanes; therefore, 14 CFR 65.107 excluded gyroplane training course facilitation as unnecessary.
[263] 88 FR 47650, 47697-98. (Jul. 24, 2023).
[264] FAA maintains a list of FAA-accepted or -approved consensus standards at: https://www.faa.gov/aircraft/gen_av/light_sport.
[265] As stated in the *Integration of Powered-Lift* Final Rule, FAA found it was infeasible to create classes of powered-lift at that time, but did not foreclose the possibility in the future (i.e., after the 10 year period of the SFAR) when industry and the FAA could discern groups of similar operating characteristics. See 89 FR 92296.
[266] See 88 FR 47650, 47698 (Jul. 24, 2023).
[267] See *Repairman Certificate Portability Working Group Preliminary Recommendation Report*, https://www.faa.gov/media/73451.
[268] See *Repairman Certificate Portability Working Group Recommendation Report*, Preliminary Recommendations.
[269] See 88 FR 47650, 47698 (Jul. 24, 2023).
[270] Experimental airworthiness certificate issued with the purpose of "operating amateur-built aircraft."
[271] 14 CFR 65.107(c).
[272] 14 CFR 65.107(d).
[273] Final rule, *Exhibition, Air-Racing, and Amateur-Built Aircraft; Airworthiness Certificate and Repairman Certification* (44 FR 46778, Aug. 9, 1979).
[274] The Administrator may prescribe additional limitations that the Administrator considers necessary, including limitations on the persons that may be carried in the aircraft.
[275] Except large aircraft with a 12,500 pounds or more gross takeoff weight, turbine powered airplanes or rotorcraft or powered-lift aircraft.
[276] Refer to FAA Order 8130.2, Table D-1.
[277] For example, aircraft issued an experimental airworthiness certificate in accordance with former 14 CFR 21.191 (i)(2) (new 14 CFR 21.191(k)) and former 14 CFR 21.191(i)(3) (new 14 CFR 21.191(l)).
[278] Aircraft issued an experimental airworthiness certificate in accordance with former 14 CFR 21.191(i)(1) (amended 14 CFR 21.191(i)).
[279] An individual who shows to FAA evidence of building the major portion of an aircraft are eligible to obtain a repairman certificate (experimental aircraft builder), with privileges limited to the aircraft that person has built. FAA considers these individuals to have demonstrated acceptable knowledge of the

aircraft and able to perform a condition inspection because the individual built the major portion of an aircraft that was found safe for flight by FAA and subsequently issued an airworthiness certificate.
[280] 14 CFR 65.107(b)(5) requires that the applicant have the requisite sill to determine whether an aircraft is in a condition for safe operation, i.e., perform a condition inspection.
[281] Final rule, *Exhibition, Air-Racing, and Amateur-Built Aircraft; Airworthiness Certificate and Repairman Certification*, 44 FR 46778 (Aug. 9, 1979).
[282] FAA-certificated mechanics and repair stations are also permitted, in accordance with part 65 subpart D and part 145, respectively, to conduct a condition inspection on an experimental amateur-built aircraft.
[283] This final rule removes the definition of a light-sport aircraft in 14 CFR 1.1 and adopts, new 14 CFR 61.316, which describes the performance limits and design requirements for aircraft that a sport pilot may operate.
[284] 88 FR 47698 (Jul. 24, 2023).
[285] While new 14 CFR 65.109(c), in pertinent part, states that if that person has not previously performed work as described in that paragraph, the person may show the ability to do the work by performing it to the satisfaction of the FAA, or by performing it under the direct supervision of a certificated and appropriately rated mechanic, or a certificated repairman, who has had previous experience in the specific operation concerned, that paragraph is simply redesignated (with only editorial revision) from 14 CFR 65.107(d).
[286] 14 CFR 65.107(c) was 14 CFR 65.107(d) prior to [INSERT DATE 90 DAYS AFTER PUBLICATION OF THIS FINAL RULE IN FEDERAL REGISTER].
[287] *National Archives Document Drafting Handbook*, 2018 Edition, Paragraph 2.15 Asterisks. https://www.archives.gov/federal-register/write/ddh.
[288] The NPRM, as the notice to the public, contained the nature of the rulemaking proceedings, the authority under which the rule was proposed, and the terms and substance of the proposed rule, with a description of the subjects and issues involved, as required by 5 U.S.C. 553(b)(1)-(3).
[289] 14 CFR 65.77(b)(1) requires practical experience with the procedures, practices, materials, tools, machine tools, and equipment generally used in constructing, maintaining, or altering airframes or powerplants.
[290] FAA Order 8110.107, *Monitor Safety/Analyze Data*.
[291] Additional discussion regarding how FAA determines mandatory overhaul or maintenance intervals can be found in FAA Order 8900.1, Volume 3, Chapter 15, Section 1, *The Elements of Maintenance*, and Section 2, *Common Areas of Confusion in Maintenance*.
[292] This is referring to the statement of compliance submitted in accordance with 14 CFR 21.190(c)(1).
[293] F2483-18e1, *Standard Practice for Maintenance and the Development of Maintenance Manuals for Light Sport Aircraft*. Paragraphs 3.1.10. and 3.1.12 state that a major repair, alteration, or maintenance is "any repair, alteration, or maintenance for which instructions to complete the task excluded from the maintenance manual(s) supplied to the consumer are considered major", and that a minor repair, alteration, or maintenance is "any repair, alteration, or maintenance for which instructions provided for in the maintenance manual(s) supplied to the consumer of the product are considered minor.
[294] In discussing the removal of "to an aircraft product produced under a consensus standard" from 14 CFR 91.327(b)(6), the NPRM accidentally omitted the word "product" in the preamble discussion of what language is being removed, but the NPRM proposed regulatory text or reflected the correct revision for 14 CFR 91.327(b)(6).
[295] In the NPRM and final rule, FAA reworded language to separate the requirement to authorize the major repair or alteration from the performance and inspection requirement. Previous wording implied that the authorization was done in accordance with the maintenance and inspection procedures, which is not accurate. The maintenance and inspection procedures must only address performance and inspection of the major repair or major alteration, not the authorization of such work on an aircraft. No comments were received on the proposed language change therefore, it was adopted in the final rule language.
[296] Refer to section IV.J.3 for additional discussion on 14 CFR 1.1. definitions for major alterations and major repairs.
[297] This definition comports with the description in the 2004 final rule, which stated a third-party modifier included a licensee who built a product or part that was not part of the original design.
[298] 69 FR 44854 (Jul. 27, 2004).

[299] Minor repairs and minor alterations are not subject to the additional requirements of 14 CFR 91.327(b)(5) of this final rule; however, the requirements of 14 CFR 91.327(b)(1) (i.e., maintain the aircraft in accordance with the applicable provisions of part 43) continue to apply.
[300] FAA-S-ACS-6C, *Private Pilot for Airplane Category Airman Certification Standards*; dated November 2023; https://www.faa.gov/training_testing/testing/acs/private_airplane_acs_6.pdf.
[301] FAA-S-8081-29A, *Sport Pilot and Sport Pilot Flight Instructor Rating Practical Test Standards for Airplane Category, Gyroplane Category, and Glider Category*, dated November 2023; https://www.faa.gov/training_testing/testing/acs/sport_airplane_pts_29.pdf.
[302] 69 FR 44804 (Jul. 27, 2004).
[303] Holding a standard category airworthiness certificate subsequently requires these aircraft to have an annual inspection performed by, at least, a certificated mechanic holding an inspection authorization. In contrast, a condition inspection on an aircraft with an experimental airworthiness certificate can be performed by a mechanic that does not hold an inspection authorization or by the holder of a repairman certificate.
[304] AC 20-62, *Eligibility, Quality, and Identification of Aeronautical Replacement Parts*; AC 23-27, *Parts and Materials Substitutions for Vintage Aircrafts,* and Work Instruction (WI) Vintage Aircraft Replacements and Modification Article (VARMA) WI-51822.
[305] See*, e.g.,* Interpretation to James Richards (November 20, 2018) (stating "the FAA interprets § 119.1(e)(4) as containing only a partial list of examples of the exceptions meeting the definition of aerial work operations."); Interpretation to Angelina Shamborska (Feb. 5, 2010) ("While the regulation cites certain examples of aerial work operations, those examples are not all-inclusive.").
[306] See Interpretation to James Richards (November 20, 2018) ("The FAA has consistently interpreted the term 'aerial work' to mean work done from the air with the same departure and destination points, while no property of another is carried on the aircraft, and only persons essential to the operation are carried onboard the aircraft."); Interpretation to Jeffrey Hill (March 10, 2011) (stating "the aerial work provision of § 119.1(e)(4)(iii) is inapplicable if property "of another" is carried on the aircraft; the operation does not begin and end at the same location; or if passengers who are not essential to the operation are carried on board the airplane").
[307] See*, e.g.,* Interpretation to Tanabe (May 21, 2010) (explaining that to qualify for the aerial work exception, "each person on board the aircraft must be necessary to perform the operation" and opining that the carriage of passengers on board who are "not required for dispersal of remains" would disqualify the flight from the aerial work exception).
[308] See*, e.g.,* Interpretation to Double Eagle Aviation, May 5, 2015 ("We further note that the exception in § 119.1(e)(4) for certain 'aerial work operations,' such as banner towing, aerial photography or survey, and powerline or pipeline patrol, does not extend to air tour operations in which the primary purpose is sightseeing.").
[309] See IV.E.5.c. in this final rule.
[310] "Pattern work" is a term of art that generally refers to traffic pattern practice for proficiency, training, and competency.
[311] See*, e.g.,* Interpretation to Melvin O. Cintron (Aug. 18, 2012) ("Although these terms are not defined by regulation, there has been a long history stretching back over 40 years of using a case-by-case approach in determining how to apply those terms and how they relate to one another. This approach 'is well documented and supported by many legal opinions issued by the FAA, the National Transportation Board (NTSB) and federal courts.'").
[312] See section IV.M. of this rule for a discussion of the codification of special purpose operations for restricted category aircraft.
[313] As explained in the safety continuum discussion in this document, restricted category civil aircraft have traditionally been placed above aircraft with experimental airworthiness certificates on the safety continuum because they are required to be maintained continuously to meet standards prescribed in a type certificate data sheet (TCDS).
[314] 89 FR 92296 (Nov. 21, 2024).
[315] International Civil Aviation Organization. *Unmanned Aircraft Systems (UAS)*. ICAO Cir 328, 2011, p.15.

[316] 69 FR 44880 (Jul. 27, 2004).
[317] Civil Air Regulations, Part 8, *Aircraft Airworthiness Restricted Category*, § 8.10(2), effective October 11, 1950.
[318] The NPRM provided the opportunity to submit proprietary or confidential business information in a way so that FAA will not place it on the public docket and will treat it as confidential under the Freedom of Information Act (5 U.S.C. 552).
[319] *Proposal for a New Special Purpose Operation in the Restricted Category Under FAR 21.25(b)(7)--Space Vehicle Launching* 59 FR 2901 (Jan. 19, 1994).
[320] See Civil Aeronautics Manual, § 8.21 *Multiple airworthiness certification*, which limited eligibility for this provision to normal, utility, acrobatic, transport, and limited categories.
[321] A "Means of Compliance" is a detailed design standard that, if met, accomplishes the intent of the regulation and is used by an applicant to show compliance with the broad requirements of 14 CFR. A means of compliance is one method, but not the only method, to show compliance with a regulatory requirement. A "Method of Compliance" is a description of how compliance will be shown (e.g., ground test, flight test, analysis, similarity, etc.). The description of the method of compliance should be sufficient to determine that all necessary compliance-related data will be collected, and all findings can be made.
[322] 88 FR 47729 (Jul. 24, 2023).
[323] https://www.regulations.gov/docket/FAA-2023-0855/comments.
[324] The fundamental difference between these two classifications of airworthiness certification is that the standard airworthiness certificate includes a finding of compliance to International Civil Aviation Organization airworthiness standards, enabling international air navigation without having to obtain permission before entering another country.
[325] Johnson, Dan and Roy Beisswenger, 2018, *Modernizing Rules for Sport Pilots and Light Sport Aircraft*.
[326] The report is available online at:
https://www.faa.gov/sites/faa.gov/files/aircraft/gen_av/light_sport/2021_SLSA_COS.pdf.
[327] FAA provides a list at: FAA Accepted ASTM Consensus Standards - LSA.
[328] The FAA's noise certification process is entirely performance-based; there are no noise-reduction technologies defined in the noise regulations. Applicants are free to choose any methods or technologies. The FAA sets the noise limits at levels that aircraft with current technology will pass.
[329] See
https://view.officeapps.live.com/op/view.aspx?src=https%3A%2F%2Fwww.faa.gov%2Faircraft%2Fgen_av%2Flight_sport%2Fmedia%2Fslsa_directory.xlsx&wdOrigin=BROWSELINK.
[330] Available at https://registry.faa.gov/aircraftinquiry/.
[331] See 2023 U.S. Civil Airmen Statistics
(https://www.faa.gov/data_research/aviation_data_statistics/civil_airmen_statistics), Table 16.
[332] National Transportation Safety Board (NTSB), 2012, *The Safety of Experimental Amateur-Built Aircraft*. NTSB/SS-12/01. https://www.ntsb.gov/investigations/AccidentReports/Reports/SS1201.pdf.
[333] U.S. Department of Transportation. 2025. https://www.transportation.gov/office-policy/transportation-policy/revised-departmental-guidance-on-valuation-of-a-statistical-life-in-economic-analysis.
[334] U.S. Department of Transportation. 2021. *Treatment of the Value of Preventing Fatalities and Injuries in Preparing Economic Analyses*. https://www.transportation.gov/resources/value-of-a-statistical-life-guidance.
[335] The calculations are 3.9 × $13.7 million and 3.5 × $1.4 million.
[336] For example, 14 CFR 22.155, fire protection, requires incorporating design features to sustain static and dynamic deceleration loads without structural damage to fuel or electrical system components or their attachments that could leak fuel to an ignition source or allow electrical power to become an ignition source. The consensus standard does not address low wing airplane designs where the fuel is abeam or forward of the occupants if fuel is in tanks built into the leading edge of the wing. 14 CFR 22.165, emergency evacuation, requires all occupants can rapidly conduct an emergency evacuation and to account for all conditions likely to occur following an emergency landing. The consensus standards don't account for all conditions, such as if the aircraft were inverted.

[337] Estimate from an acoustic Designated Engineering Representative.
[338] As noted in section IV.I.5, two glider-specific training courses will need to be updated to include content covering both unpowered and powered gliders.
[339] See AC 00-60B, § 11(a)(1).
[340] *Id.*
[341] On June 30, 2025, FAA rescinded FAA Order 1050.1F and issued FAA Order 1050.1G, *FAA National Environmental Policy Act Implementing Procedures*, to update FAA's NEPA implementing procedures. See *Notice of Rescission of FAA Order 1050.1F, Availability of FAA Order 1050.1G*, *Request for Comments*, 90 FR 29615 (July 3, 2025). The revision to FAA Order 1050.1 does not change the analysis of environmental effects for the issuance and implementation of this rule, and it is appropriate to continue reference to FAA Order 1050.1F in evaluating environmental effects for this rule.
[342] *Notice of Availability of the Draft Programmatic Environmental Assessment and Finding of No Significant Impact for Implementation of the Modernization of Special Airworthiness Certification Rule*, 90 FR 22437 (May 27, 2025).
[343] 65 FR 67249 (Nov. 6, 2000).
[344] FAA Order No. 1210.20 (Jan. 28, 2004), available at https://www.faa.gov/documentLibrary/media/1210.pdf.

List of Subjects

14 CFR Part 1

Air Transportation.

14 CFR Part 21

Aircraft, Aviation safety, Exports, Imports, Reporting and recordkeeping requirements, Voluntary standards.

14 CFR Part 22

Aircraft, Aviation safety, Voluntary standards.

14 CFR Part 36

Agriculture, Aircraft, Noise control.

14 CFR Part 43

Aircraft, Aviation safety, Reporting and recordkeeping requirements.

14 CFR Part 45

Aircraft, Signs and symbols.

14 CFR Part 61

Aircraft, Airmen, Aviation safety, Incorporation by reference, Recreation and recreation areas, Reporting and recordkeeping requirements, Teachers.

14 CFR Part 65

Air traffic controllers, Aircraft, Airmen, Airports, Aviation safety, Incorporation by reference, Reporting and recordkeeping requirements.

14 CFR Part 91

Air carriers, Air taxis, Air traffic control, Aircraft, Airmen, Airports, Aviation safety, Noise control, Reporting and recordkeeping requirements, Transportation.

14 CFR Part 119

Administrative practice and procedure, Air carriers, Aircraft, Aviation safety, Reporting and recordkeeping requirements.

14 CFR Part 147

Aircraft, Airmen, Educational facilities, Incorporation by reference, Reporting and recordkeeping requirements, Schools.

The Amendment

In consideration of the forgoing, the Federal Aviation Administration amends chapter I of title 14, Code of Federal Regulations as follows:

PART 1—DEFINITIONS AND ABBREVIATIONS

1. The authority citation for part 1 continues to read as follows:

Authority: 49 U.S.C. 106(f), 40113, 44701.

2. Amend § 1.1 by removing the definition for “Consensus standard”.

3. Effective [INSERT DATE 365 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER], amend § 1.1 by removing the definition for ‘‘Light-sport aircraft,’’ and adding the definitions for ‘‘Space support vehicle’’ and ‘‘Space support vehicle flight’’ in alphabetical order to read as follows:

§ 1.1 General definitions.

* * * * *

Space support vehicle means an aircraft that is a launch vehicle, reentry vehicle, or a component of a launch or reentry vehicle.

Space support vehicle flight means a flight in the air that is not a launch or reentry, but is conducted by a space support vehicle.

* * * * *

PART 21—CERTIFICATION PROCEDURES FOR PRODUCTS AND ARTICLES

4. The authority citation for part 21 is revised to read as follows:

Authority: 42 U.S.C. 7572; 49 U.S.C. 106(f), 40105, 40113, 44701-44702, 44704, 44707, 44709, 44711, 44713, 44715, 45303; Sec. 102, Pub. L. 116-260, 134 Stat. 2309.

5. Revise § 21.25 to read as follows:

§ 21.25 Issue of type certificate: restricted category aircraft.

(a) An applicant is entitled to a type certificate for an aircraft in the restricted category for special purpose operations if the applicant shows compliance with the applicable noise requirements of part 36 of this chapter, and if the applicant shows that no feature or characteristic of the aircraft makes it unsafe when it is operated under the limitations prescribed for its intended use, and that aircraft—

(1) Meets the airworthiness requirements of an aircraft category, other than primary category or light-sport category, except those requirements that the FAA finds inappropriate for the special purpose operation for which the aircraft is to be used; or

(2) Is of a type that—

(i) Has been manufactured in accordance with the requirements of, and accepted for use by, the U.S. Armed Forces;

(ii) Has a service history with the U.S. Armed Forces acceptable to the FAA; and

(iii) Has been found capable by the FAA of performing, or has been modified to perform, the special purpose operation for which the aircraft is to be used.

(b) Restricted category aircraft can be approved for:

(1) Agricultural use, for one or more of the following special purpose operations, including—

(i) Spraying, dusting, and seeding;

(ii) Livestock and predatory animal control;

(iii) Insect control;

(iv) Dust control; or

(v) Fruit drying and frost control.

(2) Forest and wildlife conservation, for one or more of the following special purpose operations, including—

(i) Aerial dispensing of firefighting materials;

(ii) Fish spotting;

(iii) Wild animal survey; or

(iv) Oil spill response.

(3) Aerial surveying, for one or more of the following special purpose operations, including—

(i) Aerial imaging and mapping;

(ii) Oil, gas, and mineral exploration;

(iii) Atmospheric survey and research;

(iv) Geophysical and electromagnetic survey;

(v) Oceanic survey; or

(vi) Airborne measurement of navigation signals.

(4) Patrolling, for one or more of the following special purpose operations, including—

(i) Pipelines;

(ii) Powerlines;

(iii) Data transmission lines and towers;

(iv) Railroads;

(v) Canals; or

(vi) Harbors.

(5) Weather control, including the special purpose operation of cloud seeding.

(6) Aerial advertising, for one or more of the following special purpose operations, including—

(i) Skywriting;

(ii) Banner towing;

(iii) Displaying airborne signs; or

(iv) Public address systems.

(7) Other special purpose operations, including—

(i) Rotorcraft external-load operations conducted under part 133 of this chapter;

(ii) Carriage of cargo incidental to the owner's or operator's business;

(iii) Target towing;

(iv) Search and rescue operations;

(v) Glider towing;

(vi) Alaskan fuel hauling;

(vii) Alaskan fixed-wing external load operations;

(viii) Space vehicle launch; or

(ix) Any other special purpose operation specified by the FAA.

6. Revise § 21.175 to read as follows:

§ 21.175 Airworthiness certificates: classification.

(a) Standard airworthiness certificates are airworthiness certificates issued for aircraft type certificated:

(1) In the normal, utility, acrobatic, commuter, or transport category;

(2) As manned free balloons; or

(3) As special classes of aircraft.

(b) Special airworthiness certificates are airworthiness certificates issued for:

(1) Aircraft type-certificated in the primary, restricted, provisional, or limited category;

(2) Aircraft certificated in the light-sport category;

(3) Aircraft operating for an experimental purpose; or

(4) Aircraft operating under a special flight permit.

7. Amend § 21.181 by revising paragraph (a) to read as follows:

§ 21.181 Duration.

(a) Unless sooner surrendered, suspended, revoked, or a termination date is otherwise established by the FAA, airworthiness certificates are effective as long as the aircraft is registered in the United States and as follows:

(1) Standard airworthiness certificates and special airworthiness certificates issued for aircraft certificated in the primary, restricted, or limited category are effective as long as the maintenance, preventive maintenance, and alterations are performed in accordance with parts 43 and 91 of this chapter.

(2) A special flight permit is effective for the period of time specified in the permit.

(3) A special airworthiness certificate in the light-sport category is effective as long as—

(i) The aircraft meets the definition of a light-sport aircraft;

(ii) The aircraft conforms to its original configuration, except for those alterations performed in accordance with an applicable consensus standard and authorized by the aircraft's manufacturer or a person acceptable to the FAA; and

(iii) The aircraft has no unsafe condition and is not likely to develop an unsafe condition.

(4) The duration of an experimental airworthiness certificate issued for research and development, showing compliance with regulations, crew training, or market survey is effective for 3 years from the date of issue or renewal unless the FAA prescribes a shorter period.

(5) The duration of an experimental airworthiness certificate issued for exhibition, air-racing, operating amateur-built aircraft, operating primary kit-built aircraft, operating

light-sport aircraft, operating light-sport category kit-built aircraft, operating former light-sport category aircraft is unlimited, unless the FAA establishes a specific period for good cause.

* * * * *

8. Effective [INSERT DATE 365 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER], amend § 21.181 by revising paragraph (a) to read as follows:

§ 21.181 Duration.

(a) Unless sooner surrendered, suspended, revoked, or a termination date is otherwise established by the FAA, airworthiness certificates are effective as long as the aircraft is registered in the United States and as follows:

(1) Standard airworthiness certificates and special airworthiness certificates issued for aircraft certificated in the primary, restricted, or limited category are effective as long as the maintenance, preventive maintenance, and alterations are performed in accordance with parts 43 and 91 of this chapter.

(2) A special flight permit is effective for the period of time specified in the permit.

(3) A special airworthiness certificate in the light-sport category is effective as long as all of the following conditions are met.

(i) Except as specified in paragraph (a)(3)(iv) of this section, the aircraft meets the eligibility criteria for the issuance of an airworthiness certificate in the light-sport category specified in § 21.190(b).

(ii) The aircraft conforms to its original or properly altered configuration.

(iii) The aircraft has no unsafe condition and is not likely to develop an unsafe condition.

(iv) For aircraft originally certificated prior to [INSERT DATE 365 DAYS AFTER DATE OF PUBLICATION IN THE FEDRAL REGISTER], the aircraft meets all of the following conditions:

(A) A maximum takeoff weight of not more than 1,320 pounds (600 kilograms) for aircraft not intended for operation on water or 1,430 pounds (650 kilograms) for an aircraft intended for operation on water.

(B) A maximum airspeed in level flight with maximum continuous power (V_H) of not more than 120 knots CAS under standard atmospheric conditions at sea level.

(C) A maximum never-exceed speed (V_{NE}) of not more than 120 knots CAS for a glider.

(D) A maximum stalling speed or minimum steady flight speed without the use of lift-enhancing devices (V_{S1}) of not more than 45 knots CAS at the aircraft's maximum certificated takeoff weight and most critical center of gravity.

(E) A maximum seating capacity of no more than two persons, including the pilot.

(F) A single, reciprocating engine, if powered.

(G) A fixed or ground-adjustable propeller if a powered aircraft other than a powered glider.

(H) A fixed or feathering propeller system if a powered glider.

(I) A nonpressurized cabin, if equipped with a cabin.

(J) Fixed landing gear, except for an aircraft intended for operation on water or a glider.

(K) Fixed or retractable landing gear, or a hull, for an aircraft intended for operation on water.

(L) Fixed or retractable landing gear for a glider.

(4) The duration of an experimental airworthiness certificate issued for research and development, showing compliance with regulations, crew training, or market survey is effective for 3 years from the date of issue or renewal unless the FAA prescribes a shorter period.

(5) The duration of an experimental airworthiness certificate issued for exhibition, air-racing, operating amateur-built aircraft, operating primary kit-built aircraft, operating light-sport aircraft, operating light-sport category kit-built aircraft, and operating former light-sport category aircraft, and operating former military aircraft is unlimited, unless the FAA establishes a specific period for good cause.

* * * * *

9. Effective [INSERT DATE 365 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER], amend § 21.182 by revising paragraphs (a) and (b)(2) to read as follows:

§ 21.182 Aircraft identification.

(a) Except as provided in paragraph (b) of this section, each applicant for an airworthiness certificate under this subpart must show that his aircraft is identified as prescribed in § 45.11 of this chapter.

(b) * * *

(2) An experimental airworthiness certificate issued for the purposes of research and development, showing compliance with regulations, crew training, exhibition, air racing, market surveys, or operating former military aircraft.

* * * * *

10. Amend § 21.183 by:

a. Removing the word ‘‘or’’ at the end of paragraph (d)(2)(iii);

b. Removing the word ‘‘and’’ and adding ‘‘or’’ in its place at the end of paragraph (d)(2)(iv); and

c. Adding paragraph (d)(2)(v).

The addition reads as follows:

§ 21.183 Issue of standard airworthiness certificates for normal, utility, acrobatic, commuter, and transport category aircraft; manned free balloons; and special classes of aircraft.

* * * * *

(d) * * *

(2) * * *

(v) A foreign maintenance organization appropriately certificated by an exporting authority with whose country the United States has a bilateral agreement that includes acceptance of this aircraft category by the United States for import. An acceptable inspection must have been completed while the aircraft was operated on the registry of the exporting authority and within 60 days of submitting the application for a United States airworthiness certificate.

* * * * *

11. Amend § 21.185 by revising paragraphs (a) and (b) to read as follows:

§ 21.185 Issue of airworthiness certificates for restricted category aircraft

(a) *Aircraft manufactured under a production certificate or type certificate*. An applicant for a restricted category airworthiness certificate for an aircraft type certificated

in the restricted category, that was not previously type certificated in any other category, must comply with § 21.183(a) or (b), as applicable. A used aircraft must conform to its type certificate and be in a condition for safe operation.

(b) *Other aircraft.* An applicant for an airworthiness certificate in the restricted category is entitled to an airworthiness certificate if—

(1) The aircraft is type certificated for a special purpose operation in the restricted category;

(2) The aircraft was –

(i) Manufactured in accordance with the requirements of, and accepted for use by, the U.S. Armed Forces and has a service history with the U.S. Armed Forces acceptable to the FAA; or

(ii) Previously type certificated in another category; and

(3) The aircraft has been inspected by the FAA and found by him to be in a good state of preservation and repair and in a condition for safe operation.

* * * * *

§ 21.187 Issue of multiple airworthiness certifications for restricted category aircraft.

12. Amend § 21.187 by revising the section heading to read as set forth above.

13. Effective [INSERT DATE 365 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER], revise § 21.190 to read as follows:

§ 21.190 Issue of a special airworthiness certificate for a light-sport category aircraft.

(a) *Purpose.* The FAA issues a special airworthiness certificate in the light-sport category to operate an aircraft, other than an unmanned aircraft, that meets the requirements of this section.

(b) *Eligibility.* To be eligible for a special airworthiness certificate in the light-sport category, an aircraft must meet the applicable requirements of § 22.100 of this chapter.

(c) *Application for special airworthiness certificate in the light-sport category.* Except as provided in paragraph (e) of this section, an applicant for a special airworthiness certificate under this section must provide the FAA with:

(1) The manufacturer's statement of compliance as described in paragraph (d) of this section.

(2) A pilot's operating handbook that includes:

(i) Operating instructions and limitations to safely accommodate all environmental conditions and normal, abnormal, and emergency procedures likely to be encountered in the aircraft's intended operations.

(ii) A flight training supplement to enable safe operation of the aircraft within the intended flight envelope under all likely conditions.

(iii) A listing of any aerial work operations that may be safely conducted using the aircraft and any instructions and limitations that are necessary to safely conduct those operations.

(iv) Any instructions or limitations necessary to safely conduct towing operations.

(3) A maintenance and inspection program containing procedures necessary to ensure continued safe operation of the aircraft.

(d) *Manufacturer's statement of compliance*. The manufacturer's statement of compliance specified in paragraph (c)(1) of this section must –

(1) Be signed by the manufacturer's authorized representative who is certified and trained on the requirements associated with the issuance of a statement of compliance by an organization that certifies and trains quality assurance staff in accordance with a consensus standard that has been accepted by the FAA;

(2) Identify the aircraft by make, model, serial number, class, and date of manufacture;

(3) Specify towing and any aerial work operations the manufacturer has determined may be safely conducted, and state that the aircraft has been ground and flight tested to ensure that it can be operated to safely conduct those operations in accordance with the instructions and limitations provided by the manufacturer;

(4) State whether the aircraft meets the requirements of § 22.180 of this chapter for simplified flight controls;

(5) Specify the consensus standards used to determine the aircraft's compliance with subpart B of part 22 of this chapter and state that the aircraft meets the eligibility, design, production, and airworthiness requirements of subpart B of part 22 of this chapter in accordance with those consensus standards. The specified consensus standards must be accepted or approved by the FAA for the airworthiness certification of light-sport category aircraft;

(6) State that the aircraft conforms to the manufacturer's design data, using the manufacturer's quality assurance system that meets the specified consensus standard;

(7) State that the manufacturer will make available to any interested person the documents specified in paragraph (c) of this section;

(8) State that the manufacturer will support the aircraft by implementing and maintaining a documented continued operational safety program that—

(i) Addresses monitoring and resolving in-service safety of flight issues;

(ii) Includes provisions for the issuance of safety directives;

(iii) Includes a process for notifying the FAA and all owners of all safety of flight issues; and

(iv) Includes a process for advance notice to the FAA and all owners of a continued operational safety program discontinuance or provider change.

(9) State that the manufacturer will monitor and correct safety-of-flight issues through the issuance of safety directives and a continued operational safety program that meets the specified consensus standard;

(10) State that at the request of the FAA, the manufacturer will provide unrestricted access to its facilities and to all data necessary to determine compliance with this section or other applicable requirements of this chapter; and

(11) State that the manufacturer has established and maintains a quality assurance system that meets the requirements of § 22.185 of this chapter.

(e) *Special provisions for aircraft certificated in the light-sport category before* [INSERT DATE 365 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]. The owner of an aircraft issued a light-sport category airworthiness certificate before [INSERT DATE 365 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER] may submit an amended manufacturer's statement of compliance to the FAA listing those aerial work operations that may be conducted using the aircraft. The amended statement of compliance must –

(1) Identify the aircraft by make, model, serial number, and date of manufacture.

(2) Be made by the original manufacturer of the aircraft.

(3) Reference and reaffirm the statements made in the original manufacturer's statement of compliance.

(4) State that the design and construction of the aircraft provides sufficient structural integrity to enable safe operation of the aircraft during the performance of the specified aerial work operations and that the aircraft is able to withstand any likely flight and ground loads.

(5) Specify the FAA-accepted consensus standard used to make the determination required by paragraph (e)(4) of this section.

(6) Is accompanied by revisions to the aircraft's operating instructions to indicate those aerial work operations that may be conducted using the aircraft, and any applicable revisions to the aircraft's maintenance and inspection procedures, and flight training supplement.

14. Amend § 21.191 by:

a. Revising the section heading, introductory text, and paragraph (i);

b. Adding and reserving paragraph (j), and

c. Adding paragraphs (k) and (l).

The revisions and additions read as follows:

§ 21.191 Issue of experimental airworthiness certificates.

Experimental airworthiness certificates are issued for the following experimental purposes:

* * * * *

(i) *Operating light-sport aircraft.* Operating a light-sport aircraft that—

(1) Has not been issued a U.S. or foreign airworthiness certificate and does not meet the provisions of § 103.1 of this chapter. An experimental airworthiness certificate will not be issued under this paragraph for these aircraft after January 31, 2008;

(2) Has been assembled—

(i) From an aircraft kit; and

(ii) In accordance with manufacturer's assembly instructions that meet an applicable consensus standard; and

(iii) An experimental airworthiness certificate will not be issued under paragraph (i)(2) for these aircraft after [INSERT DATE 90 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]; or

(3) Has been previously issued a special airworthiness certificate in the light-sport category under § 21.190. An experimental airworthiness certificate will not be issued under this paragraph for these aircraft after [INSERT DATE 90 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

* * * * *

(k) *Operating light-sport category kit-built aircraft.* Operating an aircraft of a type that has been certificated under § 21.190 and assembled from an aircraft kit in accordance with manufacturer's assembly instructions that meet an applicable FAA-accepted consensus standard.

(l) *Operating former light-sport category aircraft*. Operating an aircraft that previously has been issued a special airworthiness certificate in the light-sport category under § 21.190.

15. Effective [INSERT DATE 365 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER], amend § 21.191 by adding paragraph (j) to read as follows:

§ 21.191 Issue of experimental airworthiness certificates.

* * * * *

(j) *Operating former military aircraft*. Operating a former military aircraft that meets the following requirements:

(1) The aircraft is not an unmanned aircraft;

(2) The aircraft was manufactured by, purchased by, modified by, or on the registry of the U.S. Armed Forces or a foreign military.

(3) The aircraft is operated for one of the following purposes:

(i) Flying the aircraft to a base where repairs, alterations, or maintenance are to be performed and for check flights following those repairs, alterations, or maintenance;

(ii) Flying to a point of storage; or

(iii) Repositioning the aircraft for operation as a public aircraft.

16. Amend § 21.193 by revising the section heading and paragraph (e) introductory text to read as follows:

§ 21.193 Experimental airworthiness certificates: General.

* * * * *

(e) In the case of a light-sport aircraft assembled from a kit to be certificated in accordance with § 21.191(k), an applicant must provide the following:

* * * * *

17. Effective [INSERT DATE 365 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER], revise § 21.193 to read as follows:

§ 21.193 Application for special airworthiness certificates issued for experimental purposes.

An applicant for an experimental airworthiness certificate must submit the following information in a form and manner prescribed by the FAA:

(a) The experimental purpose for which the aircraft is to be used.

(b) Enough information to describe the operation, equipment, or test as applicable.

(c) The estimated time or number of flights required for the operation, for an applicant seeking issuance of an experimental airworthiness certificate for those experimental purposes specified in § 21.191(a) through (f).

(d) The areas over which flights will be conducted.

(e) Enough data to identify the aircraft.

(f) Except for a previously type certificated aircraft without an appreciable change in its external configuration, three-view drawings or three-view dimensional photographs of the aircraft.

(g) Upon inspection of the aircraft, any pertinent information found necessary by the FAA to safeguard the general public.

(h) In the case of a light-sport category aircraft assembled from a kit to be certificated in accordance with § 21.191(k), an applicant must provide the following:

(1) Evidence that an aircraft of the same make and model was manufactured and assembled by the aircraft kit manufacturer and issued a special airworthiness certificate in the light-sport category under § 21.190.

(2) The pilot's operating handbook that includes a flight training supplement.

(3) The aircraft's maintenance and inspection procedures.

(4) The manufacturer's statement of compliance for the aircraft kit used in the aircraft assembly that meets the applicable requirements of § 21.190 in effect at the time the aircraft kit was manufactured, except the statement need not indicate compliance with § 22.195 of this chapter. The statement must identify assembly instructions for the aircraft that meet an applicable consensus standard.

(5) For an aircraft kit manufactured outside the United States, evidence that the aircraft kit was manufactured in a country with which the United States has a Bilateral Airworthiness Agreement concerning airplanes or a Bilateral Aviation Safety Agreement with associated Implementation Procedures for Airworthiness concerning airplanes, or an equivalent airworthiness agreement.

18. Revise § 21.195 to read as follows:

§ 21.195 Experimental airworthiness certificates: Aircraft to be used for market surveys, sales demonstrations, and customer crew training.

(a) A manufacturer of aircraft manufactured within the United States may apply for an experimental airworthiness certificate for an aircraft that is to be used for market surveys, sales demonstrations, or customer crew training.

(b) A manufacturer of an aircraft engine manufactured by him within the United States, that has altered a type certificated aircraft by installing an engine it has manufactured, may apply for an experimental airworthiness certificate for that aircraft to be used for market surveys, sales demonstrations, or customer crew training, if the basic aircraft, before alteration, was type certificated in the normal, utility, acrobatic, commuter, transport, primary, or restricted category.

(c) A person who has altered the design of a type certificated aircraft may apply for an experimental airworthiness certificate for an altered aircraft to be used for market surveys, sales demonstrations, or customer crew training, if the basic aircraft, before alteration, was type certificated in the normal, utility, acrobatic, commuter, transport, primary, or restricted category.

(d) An applicant for an experimental airworthiness certificate under paragraphs (a), (b), or (c) of this section is entitled to that certificate if, in addition to meeting the requirements of § 21.193—

(1) He has established an inspection and maintenance program for the continued airworthiness of the aircraft; and

(2) The applicant shows that the aircraft has been flown for at least 50 hours, or for at least 5 hours if it is a type certificated aircraft which has been altered. FAA may reduce these operational requirements if the applicant provides adequate justification.

19. Revise § 21.327 to read as follows:

§ 21.327 Application.

(a) Any owner of a U.S.-registered aircraft (or the agent of the owner) may apply for an export certificate of airworthiness for that aircraft.

(b) Any person may apply for an export airworthiness approval for an aircraft engine, propeller, or article.

(c) Each applicant must apply in a form and manner prescribed by the FAA.

20. Amend § 21.329 by revising paragraph (a)(1) introductory text to read as follows:

§ 21.329 Issuance of export certificates of airworthiness.

(a) * * *

(1) A new or used aircraft manufactured under subpart F or G of this part meets the requirements under subpart H of this part for a —

* * * * *

21. Effective [INSERT DATE 365 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER], add part 22 to read as follows:

PART 22—DESIGN, PRODUCTION, AND AIRWORTHINESS REQUIREMENTS FOR NON-TYPE CERTIFICATED AIRCRAFT

Sec.

Subpart A: General
22.1 Applicability

Subpart B: Light-Sport Category Aircraft
22.100 Eligibility.
22.105 Control and maneuverability.
22.110 Structural integrity.
22.115 Powered-lift: minimum safe speed.
22.125 Environmental conditions.
22.130 Suitability and durability of materials.
22.135 Instruments and equipment.
22.140 Controls and displays.
22.145 Propulsion system.
22.150 Fuel system.
22.155 Fire protection.
22.160 Visibility.
22.165 Emergency evacuation.
22.170 Placards and markings.
22.175 [Reserved]
22.180 Special requirements for light-sport category aircraft with simplified flight controls.
22.185 Quality assurance system.
22.190 Finding of compliance by trained compliance staff.
22.195 Ground and flight testing.
y 44707, 44709, 44711, 44713, 44715, 45303.

Subpart A—General

§ 22.1 Applicability.

(a) Except as provided in paragraph (c) of this section, this part prescribes design, production, and airworthiness requirements for the issue of special airworthiness certificates, and changes to those certificates, for non-type certificated aircraft.

(b) Each person who applies under part 21 of this chapter for such a certificate or change must comply with the applicable requirements in this part.

(c) This part does not apply to:

(1) Aircraft issued an experimental airworthiness certificate, except for light-sport category kit-built aircraft;

(2) Aircraft operating under a special flight permit; or

(3) Unmanned aircraft.

Subpart B: Light-Sport Category Aircraft

§ 22.100 Eligibility.

(a) To be eligible for a special airworthiness certificate in the light-sport category issued under § 21.190 of this chapter, an aircraft must –

(1) Except for an airplane, have a maximum seating capacity of not more than two persons, including the pilot.

(2) For an airplane, have a maximum seating capacity of not more than four persons, including the pilot.

(3) Have a maximum stalling speed or minimum steady flight speed at the aircraft's maximum takeoff weight and most critical center of gravity of 61 knots CAS V_{S0} for an airplane, 45 knots CAS V_{S0} for a glider, or 45 knots CAS without the use of lift-enhancing devices, V_{S1}, for a weight-shift-control aircraft.

(4) Have a maximum speed of 250 knots CAS in level flight with maximum continuous power (V_H) under standard atmospheric conditions at sea level.

(5) Have a non-pressurized cabin, if equipped with a cabin.

(6) Not have been previously issued a standard, primary, restricted, limited, or provisional airworthiness certificate, or an equivalent airworthiness certificate by a foreign civil aviation authority.

(7) Meet the design, production, and airworthiness requirements specified in this subpart using a means of compliance consisting of consensus standards accepted or approved by the FAA.

(8) Be inspected by the FAA and found to be in a condition for safe operation.

(b) For aircraft manufactured outside the United States, an applicant must also provide the FAA evidence that—

(1) The aircraft was manufactured in a country with which the United States has a Bilateral Airworthiness Agreement concerning airplanes or Bilateral Aviation Safety Agreement with associated Implementation Procedures for Airworthiness concerning airplanes, or an equivalent airworthiness agreement; and

(2) The aircraft is eligible for an airworthiness certificate, flight authorization, or other similar certification in its country of manufacture.

§ 22.105 Control and maneuverability.

A light-sport category aircraft must –

(a) Be consistently and predictably controllable and maneuverable at all loading conditions during all phases of flight; and,

(b) Not have a tendency to inadvertently depart controlled flight or require exceptional piloting skill, alertness, or strength.

§ 22.110 Structural integrity.

(a) The design and construction of the aircraft must provide sufficient structural integrity to enable safe operations within the aircraft's flight envelope throughout the aircraft's intended life cycle; and

(b) The aircraft must be able to withstand all likely flight and ground loads, including towing and any aerial work operation, when operated within its operational limits.

§ 22.115 Powered-lift: minimum safe speed.

To be certificated in the light-sport category, powered-lift must have a known minimum safe speed for each flight condition encountered in normal operations, including applicable sources of lift and phases of flight, to maintain controlled safe flight. The minimum safe speed determination must account for the most adverse conditions for each configuration.

§ 22.125 Environmental conditions.

The aircraft must have design characteristics to safely accommodate all environmental conditions likely to be encountered during its intended operations.

§ 22.130 Suitability and durability of materials.

The suitability and durability of materials used for products and articles must account for the likely environmental conditions expected in service, the failure of which could prevent continued safe flight and landing.

§ 22.135 Instruments and equipment.

(a) The aircraft must have all instruments and equipment necessary for safe flight, to include those instruments necessary for systems control and management.

(b) The aircraft must include all instruments and equipment required for the kinds of operations for which it is authorized.

(c) The aircraft's, instruments, equipment, and systems must perform their intended functions under all operating conditions specified in the pilot's operating handbook. Likely failure or malfunction of equipment or a system must not cause loss of control of the aircraft. Equipment and systems must be considered separately and in relation to each other.

§ 22.140 Controls and displays.

The aircraft must be designed and constructed so that the pilot has the ability to reach controls and displays in a manner that provides for smooth and positive operation of the aircraft.

§ 22.145 Propulsion system.

The aircraft propulsion system must—

(a) Have controls that are simple, intuitive and not confusing;

(b) Be designed so that the failure of any product or article does not prevent continued safe flight and landing or, if continued safe flight and landing cannot be ensured, the hazard has been minimized;

(c) Not exceed safe operating limits under normal operating conditions; and

(d) Have the necessary reliability, durability, and endurance for safe flight without failure, malfunction, excessive wear, or other anomalies.

§ 22.150 Fuel system.

The aircraft fuel system must—

(a) Provide a means to safely remove or isolate the fuel stored in the system from the aircraft; and

(b) Be designed to retain fuel under all likely operating conditions.

§ 22.155 Fire protection.

The hazards of fuel or electrical fires following a survivable emergency landing must be minimized by incorporating design features to sustain static and dynamic deceleration loads without structural damage to fuel or electrical system components or their attachments that would leak fuel to an ignition source or allow electrical power to become an ignition source.

§ 22.160 Visibility.

The aircraft must be designed and constructed so that the pilot has—

(a) Sufficient visibility of controls, instruments, equipment, and placards; and

(b) Sufficient visibility outside the aircraft necessary to conduct safe aircraft operations.

§ 22.165 Emergency evacuation.

(a) The aircraft must be designed and constructed—

(1) So that all occupants have the ability to rapidly conduct an emergency evacuation; and

(2) Except as provided in paragraph (b) of this section, to account for conditions likely to occur following an emergency landing.

(b) Aircraft not intended for operation on water are not required to account for ditching in an emergency landing.

§ 22.170 Placards and markings.

The aircraft must display all placards and instrument markings necessary for safe operation and occupant warning. Markings or graphics must clearly indicate the function of each control, other than primary flight controls.

§ 22.175 [Reserved]

§ 22.180 Special requirements for light-sport category aircraft with simplified flight controls.

An aircraft that meets the following requirements may be designated by the manufacturer as having simplified flight controls—

(a) The aircraft's flight path and available power are automated, allowing the pilot to only intervene without the availability of primary flight controls.

(b) The aircraft is designed to inherently prevent loss of control under likely circumstances, regardless of pilot input; and

(c) The aircraft has a means to enable the pilot to quickly and safely discontinue or alter the flight and prevent any inadvertent activation of these functions.

§ 22.185 Quality assurance system.

The aircraft must have been designed, produced, and tested under a documented quality assurance system to ensure each product and article conforms to its design and is in a condition for safe operation.

§ 22.190 Finding of compliance by trained compliance staff.

The aircraft must have been found compliant with the provisions of the applicable FAA-accepted or approved consensus standards by individuals who have been trained on determining compliance with those consensus standards.

§ 22.195 Ground and flight testing.

The aircraft must have been ground and flight tested under documented production acceptance test procedures to–

(a) Verify aircraft performance data;

(b) Ensure the aircraft has no hazardous operating characteristics;

(c) Ensure the aircraft is in a condition for safe operation; and

(d) Ensure the aircraft can safely conduct towing and any aerial work operation designated by the manufacturer.

PART 36—NOISE STANDARDS: AIRCRAFT TYPE AND AIRWORTHINESS CERTIFICATION

22. The authority citation for part 36 is revised to read as follows:

Authority: 42 U.S.C. 4321 et seq.; 49 U.S.C. 106(f), 40113, 44701–44702, 44704, 44715; sec. 305, Pub. L. 96–193, 94 Stat. 50, 57; E.O.11514, 35 FR 4247, 3 CFR, 1966–1970 Comp., p. 902.

23. Effective [INSERT DATE 365 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER], add § 36.0 to read as follows:

§ 36.0 Applicability and statements of compliance for aircraft that do not conform to a type certificate.

(a) *General applicability.* This part may be used by persons seeking to show compliance with noise standards for aircraft described in §§ 21.190, 21.191(k), or 21.191(l), of this chapter that do not conform to a type certificate.

(b) *Compliance requirements.* A person seeking to comply with this part for an aircraft described in (a) must meet one of the following requirements.

(1) *Use of a noise consensus standard*. An aircraft described in (a) may demonstrate compliance using a noise consensus standard that meets the following conditions:

(i) The noise consensus standard has been approved by the FAA, and

(ii) The noise consensus standard has been determined by the FAA to be appropriate for the aircraft.

(2) *Use of noise procedures available for type certificated aircraft.* An aircraft described in (a) may demonstrate compliance through the procedures available for type certificated aircraft, including:

(i) A demonstration that the applicable noise limits specified in this part are not exceeded for any configuration, flight profile, or reference condition required for an aircraft to demonstrate compliance; and,

(ii) When applicable, a demonstration that any test procedures and analyses contained in a related appendix to this part have been met for any configuration, flight profile, or reference condition required.

(3) *Use of alternative means of compliance.* An aircraft described in (a) may demonstrate compliance through one of these alternative means:

(i) *Aircraft similar to a type-certificated aircraft.* An aircraft that is determined by the FAA for noise purposes to be the same as or sufficiently similar in design to a type certificated aircraft described in § 36.1 may demonstrate compliance with this part by:

(A) Using the same testing requirements as the type certificated aircraft that FAA has determined for noise purposes is the same or sufficiently similar in design to the aircraft for which a person seeks to show compliance with this part; or

(B) Adopting the noise levels of the type certificated aircraft that FAA has determined for noise purposes is the same or sufficiently similar in design.

(ii) *Aircraft with no similar type-certificated aircraft.* A person may demonstrate compliance with this part using the noise requirements determined by the FAA to be appropriate for the aircraft.

(c) *Statement of compliance*. Persons seeking to show compliance with this part must meet the requirements of (b) and must submit a statement of compliance to the agency.

(1) The statement of compliance must:

(i) State that the aircraft has demonstrated compliance with the applicable provisions of this part;

(ii) Include the noise levels of the aircraft, and procedures, aircraft configurations, aircraft weights, and other information employed for obtaining the demonstrated noise levels; and

(iii) Include the following statement: "No determination has been made by the Federal Aviation Administration whether the noise levels of this aircraft are or should be acceptable or unacceptable for operation in any location."

(2) After stating compliance with the part per paragraph (c)(1) of this section, any subsequent alteration of the aircraft that increases noise would render invalid any previous statement of compliance to this part for that aircraft.

24. Effective [INSERT DATE 365 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER], amend § 36.1 by:

a. Adding and reserving paragraph (a)(6); and

b. Adding paragraph (a)(7).

The addition reads as follows:

§ 36.1 Applicability and definitions.

(a) * * *

(7) Aircraft that do not conform to a type certificate, in accordance with § 36.0.

* * * * *

25. Effective [INSERT DATE 365 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER], revise § 36.3 to read as follows:

§ 36.3 Compatibility with airworthiness requirements.

(a) Each applicant for certification under this part must demonstrate that:

(1) For type certificated aircraft, that the aircraft complies with the airworthiness regulations in this chapter that constitute the type certification basis of the aircraft under all conditions in which compliance with this part is shown; or

(2) For aircraft without a type certificate, that the aircraft complies with all airworthiness requirements applicable to the design of the aircraft under all conditions in which compliance with this part is shown.

(b) Each applicant for certification under this part must show that any procedure used to demonstrate compliance with this part, and any procedure and information for the flight crew developed under this part, are consistent with the requirements of paragraph (a)(1) or (2) of this section.

26. Effective [INSERT DATE 365 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER], amend § 36.1501 by revising paragraph (a) to read as follows:

§ 36.1501 Procedures, noise levels, and other information

(a) All procedures, weights, configurations, and other information or data employed for obtaining the certified noise levels prescribed by this part, including equivalent procedures used for flight, testing, and analysis, must:

(1) For type certificated aircraft, be developed by the applicant and approved by the FAA. Noise levels achieved during type certification must be included in the aircraft's approved flight manual.

(2) For aircraft without a type certificate, be provided by the applicant to the FAA.

* * * * *

PART 43—MAINTENANCE, PREVENTIVE MAINTENANCE, REBUILDING, AND ALTERATION

27. The authority citation for part 43 continues to read as follows:

Authority: 42 U.S.C. 7572; 49 U.S.C. 106(f), 106(g), 40105, 40113, 44701-44702, 44704, 44707, 44709, 44711, 44713, 44715, 45303.

28. Amend § 43.1 by revising paragraph (b)(1) and (b)(2) to read as follows:

§ 43.1 Applicability.

* * * * *

(b) * * *

(1) Any aircraft for which the FAA has issued an experimental airworthiness certificate, unless the FAA has previously issued a different kind of airworthiness certificate for that aircraft;

(2) Any aircraft for which the FAA has issued an experimental airworthiness certificate under the provisions of § 21.191(i)(3) or (l) of this chapter, and the aircraft was previously issued a special airworthiness certificate in the light-sport category under the provisions of § 21.190 of this chapter; or

* * * * *

29. Amend § 43.13 by revising paragraphs (a) and (c) to read as follows:

§ 43.13 Performance rules (general).

(a) Each person performing maintenance, alteration, or preventive maintenance on an aircraft, engine, propeller, or appliance shall use the methods, techniques, and

practices prescribed in the current manufacturer's maintenance manual or Instructions for Continued Airworthiness prepared by its manufacturer, or other methods, techniques, and practices acceptable to the Administrator, except as noted in § 43.16. That person shall use the tools, equipment, and test apparatus necessary to assure completion of the work in accordance with accepted industry practices. If special equipment or test apparatus is recommended by the manufacturer involved, that person must use that equipment or apparatus or its equivalent acceptable to the Administrator.

* * * * *

(c) Unless otherwise notified by the Administrator, the methods, techniques, and practices contained in the maintenance manual or the maintenance part of the manual of the holder of an air carrier operating certificate or an operating certificate under part 121 or 135 of this chapter and operators under part 129 of this chapter holding operations specifications (that is required by its operating specifications to provide a continuous airworthiness maintenance and inspection program) constitute acceptable means of compliance with this section.

PART 45— IDENTIFICATION AND REGISTRATION MARKING

30. The authority citation for part 45 continues to read as follows:

Authority: 49 U.S.C. 106(f), 106(g), 40103, 40113–40114, 44101–44105, 44107–44111, 44504, 44701, 44708–44709, 44711–44713, 44725, 45302–45303, 46104, 46304, 46306, 47122.

31. Amend § 45.23 by revising paragraph (b) to read as follows:

§ 45.23 Display of marks; general.

* * * * *

(b) Except for unmanned aircraft, when marks include only the Roman capital letter "N" and the registration number is displayed on limited, restricted, experimental, or provisionally certificated aircraft, the operator must also display on that aircraft near each entrance to the cabin, cockpit, or pilot station, in letters not less than 2 inches nor more than 6 inches high, the words "limited," "restricted," "experimental," or "provisional," as applicable.

32. Amend § 45.29 by revising paragraph (b)(1)(iii) to read as follows:

§ 45.29 Size of marks.

* * * * *

(b) * * *

(1) * * *

(iii) Marks at least 3 inches high may be displayed on an aircraft for which the FAA has issued an experimental airworthiness certificate under § 21.191(d), (g), (i), (k), or (l) of this chapter to operate as an exhibition aircraft, an amateur-built aircraft, or a former or kit-built light-sport category aircraft when the maximum cruising speed of the aircraft does not exceed 180 knots CAS; and

* * * * *

PART 61—CERTIFICATION: PILOTS, FLIGHT INSTRUCTORS, AND GROUND INSTRUCTORS

33. The authority citation for part 61 continues to read as follows:

Authority: 49 U.S.C. 106(f), 40113, 44701-44703, 44707, 44709-44711, 44729, 44903, 45102-45103, 45301-45302; Sec. 2307 Pub. L. 114-190, 130 Stat. 615 (49 U.S.C. 44703 note); sec. 318, Pub. L. 115-254, 132 Stat. 3186 (49 U.S.C. 44703 note); sec. 820, Pub. L.

118-63, 138 Stat. 1330 (49 U.S.C. 44939 note); secs. 815 and 828, Pub. L. 118-63, 138 Stat. 1328, 1336 (49 U.S.C. 44703 note).

Part 61 – [Amended]

34. Amend § 61.3 by revising the section heading and adding paragraph (m) to read as follows:

§ 61.3 Requirement for certificates, ratings, privileges, and authorizations.

* * * * *

(m) *For a person who possesses a sport pilot certificate*. No person may exercise sport pilot privileges under § 61.313 unless that person receives a qualifying logbook endorsement under § 61.317 or § 61.321 of this part for the appropriate category and class privilege. The requirement in this paragraph (m) does not apply to a person who already holds the appropriate category and class rating on their pilot certificate.

35. Add § 61.9 to read as follows:

§ 61.9 Inapplicability of simplified flight controls aircraft experience credit.

Notwithstanding the requirements specified in § 61.51(c), any pilot time acquired while operating an airplane or helicopter with a simplified flight controls designation may not be used to satisfy the following aeronautical experience requirements for a private, commercial, or airline transport pilot certificate, except for private pilot applicants who present an aircraft with the simplified flight controls designation to conduct the practical test—

(a) The solo flight time requirements in § 61.109(a)(5) or (c)(4);

(b) The PIC flight time requirements in § 61.129(a)(2)(i) and (c)(2)(i);

(c) The PIC flight time requirements in § 61.159(a)(5); and

(d) The PIC flight time requirements in § 61.161(a)(3).

36. Amend § 61.14 by:

a. Redesignating paragraphs (b)(13) through (b)(15) as paragraphs (b)(14) through (b)(16);

b. Adding new paragraph (b)(13) and paragraph (b)(17).

The additions read as follows:

§ 61.14 Incorporation by Reference.

* * * * *

(b) * * *

(13) FAA-S-ACS-26, Sport Pilot for Rotorcraft Category Helicopter—Simplified Flight Controls Privilege Airman Certification Standards, July 2025, IBR approved for §§ 61.43, 61.321, and appendix A to this part.

* * *

(17) FAA-S-ACS-31, Flight Instructor with a Sport Pilot Rating for Rotorcraft Category Helicopter—Simplified Flight Controls Privilege Airman Certification Standards, July 2025, IBR approved for §§ 61.43, 61.419, and appendix A to this part.

37. Amend § 61.23 by redesignating paragraphs (c)(1)(vi) and (c)(1)(vii) as (c)(1)(vii) and (c)(1)(viii) and adding new paragraph (c)(1)(vi) to read as follows:

§ 61.23 Medical certificates: Requirement and duration.

* * * * *

(c)(1)(vi) Notwithstanding paragraphs (b)(1), (b)(2), and (b)(6) of this section, exercising the privileges of sport pilot certificate at night under the conditions and limitations set forth in § 61.113(i);

38. Amend § 61.31 by

a. Redesignating paragraph (l) as paragraph (m);

b. Adding new paragraph (l); and

c. Revising newly redesignated paragraph (m)(2)(vi).

The addition and revision read as follows:

§ 61.31 Type rating requirements, additional training, and authorization requirements.

* * * * *

(l) *Additional aircraft model-specific flight training.* No person may act as pilot in command of an aircraft with a simplified flight controls designation unless that person has -

(1) Received and logged model-specific flight training from an authorized instructor in that aircraft, or in a full flight simulator or flight training device that is representative of that model-specific aircraft with the simplified flight controls designation; and

(2) Received a logbook endorsement from an authorized instructor who has found the person proficient in the safe operation of that model-specific aircraft and the associated simplified flight controls.

(m) * * *

(2) * * *

(vi) The holder of a sport pilot certificate when operating an aircraft meeting the performance limits and design requirements of § 61.316.

39. Amend § 61.45 by:

a. Revising paragraphs (f) introductory text and paragraph (f)(3); and

b. Adding paragraphs (g) and (h).

The revisions and additions read as follows:

§ 61.45 Practical tests: Required aircraft and equipment.

* * *

(f) *Conduct of a sport pilot practical test in an aircraft with a single seat*. A practical test for a sport pilot certificate may be conducted in an aircraft having a single seat provided that the –

* * * * *

(3) Pilot certificate of an applicant successfully passing the test is issued with a limitation "No passenger carriage and flight in a single-seat aircraft only."

(g) *Aircraft with a simplified flight controls designation*. An applicant for a pilot certificate, rating, or privilege may use an aircraft with a simplified flight controls designation for a practical test if -

(1) The examiner agrees to conduct the test;

(2) The examiner holds the appropriate category and class rating or privilege, the simplified flight controls model-specific aircraft endorsement, and an appropriate FAA designation to conduct the test;

(3) The examiner is able to assume control of the aircraft at any time, except if paragraph (f) of this section applies; and

(4) Upon successful completion of the practical test, the applicant is issued one of the following:

(i) A pilot certificate with the appropriate category, class, and specific make and model limitation in which the pilot is authorized to act as pilot in command; or

(ii) A sport pilot certificate with a logbook endorsement for the category and class of aircraft and a model specific limitation in which the pilot is authorized to act as pilot in command.

(h) *Simplified flight controls limitation.* A person who receives a category and class rating or privilege with a simplified flight controls limitation may operate only the specified make and model of aircraft set forth by the limitation unless the person satisfies the following requirements, as applicable:

(1) If seeking to operate another make and model of aircraft with a simplified flight controls designation in the same category and class, the person must receive training and an endorsement in accordance with § 61.31(l) of this part.

(2) Except as provided in § 61.321(a), if seeking to operate a different category and class of aircraft with a simplified flight controls designation as an initial applicant for that category and class rating or any aircraft without a simplified flight controls designation, the person must successfully complete a practical test for that category and class of aircraft.

40. Amend § 61.195 by adding paragraphs (m) and (n) to read as follows:

§ 61.195 Flight instructor limitations and qualifications.

* * * * *

(m) *Training in an aircraft with a simplified flight controls designation.* A flight instructor may not conduct instruction in a simplified flight control designation aircraft unless they hold the appropriate category and class rating prior to adding the make and model endorsement required by § 61.31(l).

(n) *Initial cadre training in an aircraft with a simplified flight controls designation.*

(1) For purposes of this paragraph (n), instructor pilot means a pilot employed or used by a manufacturer of an aircraft with a simplified flight controls designation to conduct operations of that aircraft for the purpose of providing crew training.

(2) A flight instructor may conduct flight training in an aircraft with a simplified flight controls designation without satisfying the training and endorsement requirements under § 61.31(l), provided the flight instructor—

(i) Holds a flight instructor certificate with the appropriate aircraft category and class, (if a class is required);

(ii) Has received and logged model-specific training in that aircraft from an instructor pilot for the manufacturer of the aircraft; and

(iii) Has received a logbook or training record endorsement from the instructor pilot certifying that the flight instructor is proficient in the safe operation of that model-specific aircraft and the associated simplified flight controls.

(3) Notwithstanding the requirements in § 61.3(d)(2)(ii), an instructor pilot may provide the training and endorsement specified in paragraph (n)(2) of this section in lieu of an authorized instructor.

41. Amend § 61.303 by revising the section heading and paragraphs (a) and (b)(4) to read as follows:

§ 61.303 If I want to operate an aircraft that satisfies the limitations identified in § 61.316, what operating limits and endorsement requirements in this subpart must I comply with?

(a) Use the following table to determine what operating limits and endorsement requirements in this subpart, if any, apply to you when you operate an aircraft that satisfies the limitations identified in § 61.316. The medical certificate specified in this table must be in compliance with § 61.2 in regard to currency and validity. If you hold a recreational pilot certificate, but not a medical certificate, you must comply with cross country requirements in § 61.101(c), even if your flight does not exceed 50 nautical miles

from your departure airport. You must also comply with requirements in other subparts of this part that apply to your certificate and the operation you conduct. In the following table, when the word "aircraft" is used, it refers to aircraft that satisfy the limitations identified in § 61.316.

If you hold	And you hold	Then you may operate	And
(1) A medical certificate	(i) A sport pilot certificate,	Any aircraft for which you hold the endorsements required for its category and class,	You must hold any other endorsements required by this subpart, and comply with the limitations in § 61.315.
	(ii) At least a recreational pilot certificate with a category and class rating,	Any aircraft in that category and class,	You do not have to hold any of the endorsements required by this subpart, nor do you have to comply with the limitations in § 61.315.
	(iii) At least a recreational pilot certificate but not a rating for the category and class of the aircraft you operate,	That aircraft, only if you hold the endorsements required for § 61.321 for its category and class,	You must comply with the limitations in § 61.315, except § 61.315(c)(14) and, if a private pilot or higher, § 61.315(c)(7).
(2) Only a U.S. driver's license	(i) A sport pilot certificate,	Any aircraft for which you hold the endorsements required for its category and class.	You must hold any other endorsements required by this subpart, and comply with the limitations in § 61.315.
	(ii) At least a recreational pilot certificate with a category and class rating,	Any aircraft in that category and class,	You do not have to hold any of the endorsements required by this subpart, but you must comply with the limitations in § 61.315.

	(iii) At least a recreational pilot certificate but not a rating for the category and class of aircraft you operate,	That aircraft, only if you hold the endorsements required in § 61.321 for its category and class,	You must comply with the limitations in § 61.315, except § 61.315(c)(14) and, if a private pilot or higher, § 61.315(c)(7).
(3) Neither a medical certificate nor a U.S. driver's license	(i) A sport pilot certificate,	Any glider or balloon for which you hold the endorsements required for its category and class,	You must hold any other endorsements required by this subpart, and comply with the limitations in § 61.315.
	(ii) At least a private pilot certificate with a category and class rating for glider or balloon,	Any glider or balloon in that category and class	You do not have to hold any of the endorsements required by this subpart, nor do you have to comply with the limitations in § 61.315.
	(iii) At least a private pilot certificate but not a rating for glider or balloon,	Any glider or balloon, only if you hold the endorsements required in § 61.321 for its category and class.	You must comply with the limitations in § 61.315, except § 61.315(c)(14) and, if a private pilot or higher, § 61.315(c)(7).

(b) * * *

(4) Not know or have reason to know of any medical condition that would make that person unable to operate an aircraft in a safe manner.

42. Revise § 61.305 to read as follows:

§ 61.305 What are the age and language requirements for a sport pilot certificate?

To be eligible for a sport pilot certificate you must:

(a) Be at least 17 years old (or 16 years old if you are applying to operate a glider or balloon).

(b) Be able to read, speak, write, and understand English. If you cannot read, speak, write, and understand English because of medical reasons, the FAA may place limits on your certificate as are necessary for the safe operation of an aircraft.

43. Amend § 61.307 by revising paragraph (b) to read as follows:

§ 61.307 What tests do I have to take to obtain a sport pilot certificate?

* * * * *

(b) *Practical test.* You must pass a practical test on the applicable areas of operation listed in §§ 61.309 and 61.311. Before you may take the practical test for a sport pilot certificate, you must receive a logbook endorsement from the authorized instructor who provided you with flight training on the areas of operation specified in §§ 61.309 and 61.311 in preparation for the practical test. This endorsement certifies that you meet the applicable aeronautical knowledge and flight proficiency requirements and are prepared for the practical test.

44. Revise § 61.311 to read as follows:

§ 61.311 What flight proficiency requirements must I meet to apply for a sport pilot certificate?

To apply for a sport pilot certificate, you must receive and log ground and flight training from an authorized instructor on the following areas of operation, as appropriate, for airplane single-engine land or sea, glider, gyroplane, helicopter, airship, balloon, powered parachute land or sea, weight-shift-control aircraft land or sea privileges:

(a) Preflight preparation.

(b) Preflight procedures.

(c) Airport, heliport, seaplane base, and gliderport operations, as applicable.

(d) Hovering maneuvers (applicable only to helicopters).

(e) Takeoffs (or launches), landings, and go-arounds.

(f) Performance maneuvers and, for gliders, performance speeds.

(g) Ground reference maneuvers (not applicable to gliders**,** helicopters, and balloons).

(h) Soaring techniques (applicable only to gliders).

(i) Navigation.

(j) Slow flight (not applicable to lighter-than-air aircraft**,** helicopters, and powered parachutes).

(k) Stalls (not applicable to lighter-than-air aircraft, gyroplanes**,** helicopters, and powered parachutes).

(l) Emergency operations.

(m) Post-flight procedures.

45. Revise § 61.313 to read as follows:

§ 61.313 What aeronautical experience must I have to apply for a sport pilot certificate?

(a) *Aeronautical experience*. Use the following table to determine the aeronautical experience you must have to apply for a sport pilot certificate:

If you are applying for a sport pilot certificate with…	Then you must log at least…	Which must include at least…
(1) Airplane category and single-engine land or sea class privileges,	20 hours of flight time, including at least 15 hours of flight training from an authorized instructor in a single-engine airplane and at least 5 hours of solo flight training in the areas of operation listed in § 61.311,	(i) 2 hours of cross-country flight training; (ii) 10 takeoffs and landings to a full stop (with each landing involving a flight in the traffic pattern) at an airport;

		(iii) One solo cross-country flight of at least 75 nautical miles total distance, with a full-stop landing at a minimum of two points and one segment of the flight consisting of a straight-line distance of at least 25 nautical miles between the takeoff and landing locations; and (iv) 2 hours of flight training with an authorized instructor on those areas of operation specified in § 61.311 in preparation for the practical test within the preceding 2 calendar months from the month of the test.
(2) Glider category privileges, and you have not logged at least 20 hours of flight time in a heavier-than-air aircraft,	10 hours of flight time in a glider, including 10 flights in a glider receiving flight training from an authorized instructor and at least 2 hours of solo flight training in the areas of operation listed in § 61.311,	(i) Five solo launches and landings; and (ii) at least 3 training flights with an authorized instructor on those areas of operation specified in § 61.311 in preparation for the practical test within the preceding 2 calendar months from the month of the test.
(3) Glider category privileges, and you have logged at least 20 hours of flight time in a heavier-than-air aircraft,	3 hours of flight time in a glider, including five flights in a glider while receiving flight training from an authorized instructor and at least 1 hour of solo flight training in the areas of operation listed in § 61.311,	(i) Three solo launches and landings; and (ii) at least 3 training flights with an authorized instructor on those areas of operation specified in § 61.311 in preparation for the practical test within the preceding 2 calendar months from the month of the test.
(4) Rotorcraft category and gyroplane class privileges,	20 hours of flight time, including 15 hours of flight training from an authorized instructor in a gyroplane and at least 5 hours of solo flight training in the areas of operation listed in § 61.311,	(i) 2 hours of cross-country flight training; (ii) 10 takeoffs and landings to a full stop (with each landing involving a flight in the traffic pattern) at an airport; (iii) One solo cross-country flight of at least 50 nautical

		miles total distance, with a full-stop landing at a minimum of two points, and one segment of the flight consisting of a straight-line distance of at least 25 nautical miles between the takeoff and landing locations; and (iv) 2 hours of flight training with an authorized instructor on those areas of operation specified in § 61.311 in preparation for the practical test within the preceding 2 calendar months from the month of the test.
(5) Lighter-than-air category and airship class privileges,	20 hours of flight time, including 15 hours of flight training from an authorized instructor in an airship and at least 3 hours performing the duties of pilot in command in an airship with an authorized instructor in the areas of operation listed in § 61.311,	(i) 2 hours of cross-country flight training; (ii) Three takeoffs and landings to a full stop (with each landing involving a flight in the traffic pattern) at an airport; (iii) One cross-country flight of at least 25 nautical miles between the takeoff and landing locations; and (iv) 2 hours of flight training with an authorized instructor on those areas of operation specified in § 61.311 in preparation for the practical test within the preceding 2 calendar months from the month of the test.
(6) Lighter-than-air category and balloon class privileges,	7 hours of flight time in a balloon, including three flights with an authorized instructor and one flight performing the duties of pilot in command in a balloon with an authorized instructor in the areas of operation listed in § 61.311,	(i) 2 hours of cross-country flight training; and (ii) 1 hour of flight training with an authorized instructor on those areas of operation specified in § 61.311 in preparation for the practical test within the preceding 2 calendar months from the month of the test.

(7) Powered parachute category land or sea class privileges,	12 hours of flight time in a powered parachute, including 10 hours of flight training from an authorized instructor in a powered parachute, and at least 2 hours of solo flight training in the areas of operation listed in § 61.311,	(i) 1 hour of cross-country flight training; (ii) 20 takeoffs and landings to a full stop in a powered parachute with each landing involving flight in the traffic pattern at an airport; (iii) 10 solo takeoffs and landings to a full stop (with each landing involving a flight in the traffic pattern) at an airport; (iv) One solo flight with a landing at a different airport and one segment of the flight consisting of a straight-line distance of at least 10 nautical miles between takeoff and landing locations; and (v) 1 hour of flight training with an authorized instructor on those areas of operation specified in § 61.311 in preparation for the practical test within the preceding 2 calendar months from the month of the test.
(8) Weight-shift-control aircraft category land or sea class privileges,	20 hours of flight time, including 15 hours of flight training from an authorized instructor in a weight-shift-control aircraft and at least 5 hours of solo flight training in the areas of operation listed in § 61.311,	(i) 2 hours of cross-country flight training; (ii) 10 takeoffs and landings to a full stop (with each landing involving a flight in the traffic pattern) at an airport; (iii) One solo cross-country flight of at least 50 nautical miles total distance, with a full-stop landing at a minimum of two points, and one segment of the flight consisting of a straight-line distance of at least 25 nautical miles between takeoff and landing locations; and (iv) 2 hours of flight training with an authorized instructor on those areas of operation

		specified in § 61.311 in preparation for the practical test within the preceding 2 calendar months from the month of the test.
(9) Rotorcraft category and helicopter class, only if that helicopter is certificated under § 21.190 and obtains the simplified flight controls designation,	30 hours of helicopter flight time, including at least 15 hours of flight training from an authorized instructor in a helicopter, and at least 5 hours of solo flight training in the areas of operation listed in § 61.311, as appropriate,	(i) 2 hours of cross-country flight training; (ii) 10 takeoffs and landings to a full stop (with each landing involving a flight in the traffic pattern) at an airport; (iii) One solo cross-country flight of at least 50 nautical miles total distance, with a full-stop landing at a minimum of two points, and one segment of the flight consisting of a straight-line distance of at least 25 nautical miles between the takeoff and landing locations; and (iv) 2 hours of flight training with an authorized instructor on those areas of operation specified in § 61.311 in preparation for the practical test within the preceding 2 calendar months from the month of the test.

(b) *Flight simulation training device and aviation training device credit*. (1) Sport pilot applicants can use up to 2.5 hours of training credit in a qualified flight simulation training device and aviation training device representing the appropriate category and class of aircraft to meet the experience requirements of this part.

(2) The training must be provided by an authorized instructor who possesses the appropriate aircraft rating or privilege sought by the applicant.

46. Amend § 61.315 by revising paragraphs (a), (c) introductory text, and (c)(5), and adding paragraph (c)(20) to read as follows:

§ 61.315 What are the privileges and limits of my sport pilot certificate?

(a) If you hold a sport pilot certificate you may act as pilot in command of an aircraft that meets the provisions of § 61.316, except as specified in paragraph (c) of this section.

* * * * *

(c) You may not act as pilot in command of an aircraft:

* * *

(5) At night, except as provided in § 61.329 of this part.

* * *

(20) If the aircraft—

(i) Has retractable landing gear, unless you have met the requirements of § 61.331(a); or

(ii) Is an airplane with a manual controllable pitch propeller, unless you have met the requirements of § 61.331(b).

(21) That requires a pilot to hold a type rating in accordance with § 61.31(a).

47. Add § 61.316 to read as follows:

§ 61.316 What are the performance limits and design requirements for the aircraft that a sport pilot may operate?

(a) If you hold a sport pilot certificate, you may act as pilot in command of an aircraft that, since its original certification, meets the following requirements:

(1) A maximum stalling speed or minimum steady flight speed without the use of lift-enhancing devices (V_{S1}) of not more than 45 knots CAS, except for airplanes, which must have a V_{S1} speed of not more than 59 knots CAS at the aircraft's maximum certificated takeoff weight and most critical center of gravity.

(2) A maximum seating capacity of two persons, except for airplanes, which may have a maximum seating capacity of four persons.

(3) A non-pressurized cabin, if equipped with a cabin.

(4) For gyroplanes, a fixed-pitch, semi-rigid, teetering, two-blade rotor system.

(5) For powered aircraft other than balloons or airships, the loss of partial power would not adversely affect directional control of the aircraft and the aircraft design must allow the pilot the capability of establishing a controlled descent in the event of a partial or total powerplant failure.

(6) For helicopters, they must be certificated with the simplified flight controls designation.

(7) For gliders, fixed or retractable landing gear.

(8) For powered-aircraft other than a glider, fixed landing gear except as provided in paragraph (b) of this section.

(9) For powered-aircraft other than a glider, a fixed, ground-adjustable, or an automated controllable pitch propeller except as provided in paragraph (b) of this section.

(b) If you hold a sport pilot certificate, you may act as pilot in command of an aircraft that has retractable landing gear or an airplane with a manual controllable pitch propeller if you have met the training and endorsement requirements specified in § 61.331.

48. Revise § 61.321 to read as follows:

§ 61.321 How do I obtain privileges to operate an additional category or class of aircraft?

(a) If you hold a sport pilot or higher grade certificate and seek to operate an additional category or class of aircraft meeting the performance limits and design

requirements of § 61.316 under this subpart, other than an airplane single-engine land or sea or a rotorcraft-helicopter, you must—

(1) Receive a logbook endorsement from the authorized instructor who trained you on the applicable aeronautical knowledge areas specified in § 61.309 and areas of operation specified in § 61.311. The endorsement certifies you have met the aeronautical knowledge and flight proficiency requirements for the additional aircraft privilege you seek;

(2) Successfully complete a proficiency check from an authorized instructor, other than the instructor who trained you, consisting of the tasks in the appropriate areas of operation contained in the applicable Practical Test Standards or Airman Certification Standards (incorporated by reference, see § 61.14) as listed in appendix A of this part for the additional sport pilot privilege you seek;

(3) Complete an application for those privileges on a form and in a manner acceptable to the FAA and present this application to the authorized instructor who conducted the proficiency check specified in paragraph (a)(2) of this section; and

(4) Receive a logbook endorsement from the authorized instructor who conducted the proficiency check specified in paragraph (a)(2) of this section certifying you are proficient in the applicable areas of operation and aeronautical knowledge areas, and that you are authorized for the additional category and class aircraft privilege.

(b) If you hold a sport pilot or higher grade certificate and seek to operate an airplane single-engine land or sea or a rotorcraft-helicopter meeting the performance limits and design requirements of § 61.316, you must successfully accomplish a practical test for that category and class privilege as specified in § 61.307(b).

49. Add §§ 61.329 and 61.331 to subpart J to read as follows:

§ 61.329 How do I obtain privileges to operate an aircraft at night?

You may act as pilot in command with a sport pilot certificate during night operations if you:

(a) Receive 3 hours of night flight training in the specific category and class from an authorized instructor that includes--

(1) Conduct at least one cross-country flight during the flight training under paragraph (a) of this section at night, with a landing at an airport of at least 25 nautical miles from the departure airport, except for powered parachutes; and

(2) Accomplish at least 10 takeoffs and 10 landings to a full stop at night;

(b) Either hold a medical certificate issued under part 67 of this chapter or meet the conditions of § 61.113(i) and the operation is conducted consistent with this section. Where the requirements of § 61.316 conflict with § 61.113(i), a sport pilot must comply with § 61.316; and

(c) Receive a logbook endorsement from an authorized instructor certifying that you meet the training requirements in paragraph (a) of this section and are proficient in the operation of the aircraft at night in the category and class which the sport pilot seeks privileges.

§ 61.331 How do I obtain privileges to operate an aircraft with retractable landing gear or an airplane with a manual controllable pitch propeller?

(a) If you hold a sport pilot certificate and seek privileges to operate an aircraft with retractable landing gear, you must either—

(1) Satisfy the training and endorsement requirements specified in § 61.31(e), or

(2) Receive and log ground and flight training from an authorized instructor in an aircraft that has retractable landing gear and receive an endorsement from the instructor certifying that you are proficient to operate the aircraft.

(b) If you hold a sport pilot certificate and seek privileges to operate an airplane with a manual controllable pitch propeller, you must either—

(1) Satisfy the training and endorsement requirements specified in § 61.31(e), or

(2) Receive and log ground and flight training from an authorized instructor in an airplane that has a manual controllable pitch propeller and receive an endorsement from the instructor certifying that you are proficient to operate the airplane.

(c) The training and endorsement required by paragraph (a) of this section is not required for pilots seeking to operate aircraft intended for operation on water with retractable landing gear if the person logged pilot-in-command time in such an aircraft before [INSERT DATE 90 DAYS AFTER FINAL RULE PUBLICATION].

50. Revise § 61.409 to read as follows:

§ 61.409 What flight proficiency requirements must I meet to apply for a flight instructor certificate with a sport pilot rating?

You must receive and log ground and flight training from an authorized instructor on the following areas of operation for the aircraft category and class in which you seek flight instructor privileges:

(a) Technical subject areas.

(b) Preflight preparation.

(c) Preflight lesson on a maneuver to be performed in flight.

(d) Preflight procedures.

(e) Airport, heliport, seaplane base, and gliderport operations, as applicable.

(f) Hovering maneuvers (applicable only to helicopters).

(g) Takeoffs (or launches), landings, and go-arounds.

(h) Fundamentals of flight.

(i) Performance maneuvers and, for gliders, performance speeds.

(j) Ground reference maneuvers (except for gliders, helicopters, and lighter-than-air).

(k) Soaring techniques (gliders only).

(l) Slow flight (not applicable to lighter-than-air, helicopters, and powered parachutes).

(m) Stalls (not applicable to lighter-than-air, powered parachutes, helicopters, and gyroplanes).

(n) Spins (applicable to airplanes and gliders).

(o) Emergency operations.

(p) Tumble entry and avoidance techniques (applicable to weight-shift-control aircraft).

(q) Special operations (helicopter only).

(r) Post-flight procedures.

51. Amend § 61.411 by adding paragraph (h) to read as follows:

§ 61.411 What aeronautical experience must I have to apply for a flight instructor certificate with a sport pilot rating?

* * * * *

If you are applying for a flight instructor certificate with a sport pilot rating for…	Then you must log at least…	Which must include at least…
* * * * * * *		
(h) Rotorcraft category and helicopter class, only if that helicopter is certificated under § 21.190 and obtains the simplified flight controls designation,	(1) 150 hours of flight time as a pilot,	(i) 100 hours of flight time as pilot in command in powered aircraft; (ii) 50 hours of flight time in a helicopter; (iii) 25 hours of cross-country flight time; (iv) 10 hours of cross-country flight time in a helicopter; and (v) 15 hours of flight time as pilot in command in a helicopter.

52. Amend § 61.413 by adding paragraph (d) to read as follows:

§ 61.413 What are the privileges of my flight instructor certificate with a sport pilot rating?

* * * * *

(d) Notwithstanding § 61.315(c)(2) and (3), a person who holds a flight instructor certificate issued under this subpart K of this part may receive compensation for providing flight training in accordance with this subpart.

53. Amend § 61.415 by adding paragraphs (k) through (n) to read as follows:

§ 61.415 What are the limits of a flight instructor certificate with a sport pilot rating?

If you hold a flight instructor certificate with a sport pilot rating, you may only provide flight training in an aircraft meeting the performance limits and design requirements of § 61.316 and are subject to the following limits:

* * * * *

(k) You cannot carry more than one person.

(l) You may not provide training in an airplane with a manual controllable pitch propeller or an aircraft with a retractable landing gear unless you have received training and an instructor endorsement validating proficiency in the safe operation of these types of aircraft.

(m) You may not provide training in an aircraft that has the simplified flight controls designation unless you have received the model-specific flight training and an endorsement from an authorized instructor validating proficiency in the safe operation of these aircraft.

(n) You may not provide training in an aircraft at night unless you have completed the night experience and instructor endorsement requirements listed in § 61.329 for the category and class you seek to provide training in.

54. Amend § 61.419 by:

a. Revising the section heading, introductory text, and paragraph (b); and

b. Adding paragraph (e).

The revisions and addition read as follows:

§ 61.419 How do I obtain privileges to provide training in an additional category or class of aircraft?

If you hold a flight instructor certificate issued under subpart H of this part or a flight instructor certificate with a sport pilot rating and seek privileges to provide training under subpart K in an additional category or class of aircraft meeting the performance limits and design requirements of § 61.316, you must—

* * * * *

(b) Except as provided in paragraph (e) of this section, successfully complete a proficiency check from an authorized instructor, other than the instructor who trained you, consisting of the tasks in the appropriate areas of operation contained in the applicable Practical Test Standards or Airman Certification Standards (incorporated by reference, see § 61.14) as listed in appendix A of this part for the additional category and class flight instructor privilege you seek;

* * * * *

(e) If you are seeking to add an airplane single-engine land or sea or a rotorcraft-helicopter with simplified flight controls designation privilege to your flight instructor certificate, successfully accomplish a practical test for that category and class privilege as specified in § 61.405.

55. Amend § 61.429 by revising paragraph (c) and adding paragraph (d) to read as follows:

§ 61.429 May I exercise the privileges of a flight instructor certificate with a sport pilot rating if I hold a flight instructor certificate with another rating?

* * * * *

(c) If you want to exercise the privileges of your flight instructor certificate in a category or class of aircraft for which you are not currently rated, you must meet all applicable requirements to provide training in an additional category or class of aircraft specified in § 61.419.

(d) If you want to exercise the privileges of your flight instructor certificate in a model-specific aircraft that has a simplified flight controls designation, you must meet the training and endorsement requirements specified in § 61.31(l) prior to providing any flight training in that aircraft.

56. Revise appendix A to read as follows:

Appendix A to Part 61—Airman Certification Standards and Practical Test Standards

If you are seeking this certificate, rating, and/or privilege . . .	**Then this ACS/PTS (incorporated by reference, see § 61.14) is applicable:**
Airline Transport Pilot Certificate; Airplane Category—Single-Engine Land Rating, Airplane Category—Single-Engine Sea Rating, Airplane Category—Multiengine Land Rating, Airplane Category—Multiengine Sea Rating	FAA-S-ACS-11A, Airline Transport Pilot and Type Rating for Airplane Category Airman Certification Standards, November 2023.
Airline Transport Pilot Certificate; Rotorcraft Category—Helicopter Rating	FAA-S-8081-20A, Airline Transport Pilot and Aircraft Type Rating Practical Test Standards for Rotorcraft Category Helicopter Rating, November 2023.
Airline Transport Pilot Certificate; Powered-Lift Category	FAA-S-ACS-17, Airline Transport Pilot and Type Rating for Powered-Lift Category Airman Certification Standards, November 2023.
Commercial Pilot Certificate; Airplane Category—Single-Engine Land Rating, Airplane Category—Single-Engine Sea Rating, Airplane Category—Multiengine Land Rating, Airplane Category—Multiengine Sea Rating	FAA-S-ACS-7B, Commercial Pilot for Airplane Category Airman Certification Standards, November 2023.
Commercial Pilot Certificate; Rotorcraft Category—Helicopter Rating	FAA-S-ACS-16, Commercial Pilot for Rotorcraft Category Helicopter Rating Airman Certification Standards, November 2023.
Commercial Pilot Certificate; Rotorcraft Category—Gyroplane Rating	FAA-S-8081-16C, Commercial Pilot Practical Test Standards for Rotorcraft Category Gyroplane Rating, November 2023.
Commercial Pilot Certificate; Powered-Lift Category	FAA-S-ACS-2, Commercial Pilot for Powered-Lift Category Airman Certification Standards, November 2023.
Commercial Pilot Certificate; Glider Category	FAA-S-8081-23B, Commercial Pilot Practical Test Standards for Glider Category, November 2023.
Commercial Pilot Certificate; Lighter-Than-Air Category—Airship Rating,	FAA-S-8081-18A, Commercial Pilot Practical Test Standards for Lighter-Than-Air Category, November 2023.

Lighter-Than-Air Category—Balloon Rating	
Private Pilot Certificate; Airplane Category—Single-Engine Land Rating, Airplane Category—Single-Engine Sea Rating, Airplane Category—Multiengine Land Rating, Airplane Category—Multiengine Sea Rating	FAA-S-ACS-6C, Private Pilot for Airplane Category Airman Certification Standards, November 2023.
Private Pilot Certificate; Rotorcraft Category—Helicopter Rating	FAA-S-ACS-15, Private Pilot for Rotorcraft Category Helicopter Rating Airman Certification Standards, November 2023.
Private Pilot Certificate; Rotorcraft Category—Gyroplane Rating	FAA-S-8081-15B, Private Pilot Practical Test Standards for Rotorcraft Category Gyroplane Rating, November 2023.
Private Pilot Certificate; Powered-Lift Category	FAA-S-ACS-13, Private Pilot for Powered-Lift Category Airman Certification Standards, November 2023.
Private Pilot Certificate; Glider Category	FAA-S-8081-22A, Private Pilot Practical Test Standards for Glider Category, November 2023.
Private Pilot Certificate; Lighter-Than-Air Category—Airship Rating, Lighter-Than-Air Category—Balloon Rating	FAA-S-8081-17A, Private Pilot Practical Test Standards for Lighter-Than-Air Category, November 2023.
Private Pilot Certificate; Powered Parachute Category—Land Rating, Powered Parachute Category—Sea Rating, Weight-Shift-Control Aircraft Category—Land Rating, Weight-Shift-Control Aircraft Category—Sea Rating	FAA-S-8081-32A, Private Pilot Practical Test Standards for Powered Parachute Category and Weight-Shift-Control Category, November 2023.
Recreational Pilot Certificate; Airplane Category—Single-Engine Land Rating, Airplane Category—Single-Engine Sea Rating, Rotorcraft Category—Helicopter Rating, Rotorcraft Category—Gyroplane Rating	FAA-S-8081-3B, Recreational Pilot Practical Test Standards for Airplane Category and Rotorcraft Category, November 2023.
Sport Pilot Certificate; Airplane Category—Single-Engine Land Privileges, Airplane Category—Single-Engine Sea Privileges, Rotorcraft Category—Gyroplane Privileges, Glider Category	FAA-S-8081-29A, Sport Pilot and Sport Pilot Flight Instructor Rating Practical Test Standards for Airplane Category, Rotorcraft Category, and Glider Category, November 2023.
Flight Instructor Certificate with a Sport Pilot Rating; Airplane Category—Single-Engine Privileges, Rotorcraft Category—Gyroplane Privileges, Glider Category	

Sport Pilot Certificate; Rotorcraft Category – Helicopter Privilege—Simplified Flight Controls	FAA-S-ACS-26, Sport Pilot for Rotorcraft Category Helicopter—Simplified Flight Controls Privilege Airman Certification Standards, July 2025.
Flight Instructor Certificate with a Sport Pilot Rating; Rotorcraft Helicopter—Simplified Flight Controls	FAA-S-ACS-31, Flight Instructor with a Sport Pilot Rating for Rotorcraft Category Helicopter—Simplified Flight Controls Privilege Airman Certification Standards, July 2025.
Sport Pilot Certificate; Lighter-Than-Air Category—Airship Privileges, Lighter-Than-Air Category—Balloon Privileges	FAA-S-8081-30A, Sport Pilot and Sport Pilot Flight Instructor Rating Practical Test Standards for Lighter-Than-Air Category, November 2023.
Flight Instructor Certificate with a Sport Pilot Rating; Lighter-Than-Air Category—Airship Privileges, Lighter-Than-Air Category—Balloon Privileges	
Sport Pilot Certificate; Powered Parachute Category—Land Privileges, Powered Parachute Category—Sea Privileges, Weight-Shift-Control Aircraft Category—Land Privileges, Weight-Shift-Control Aircraft Category—Sea Privileges	FAA-S-8081-31A, Sport Pilot and Sport Pilot Flight Instructor Rating Practical Test Standards for Powered Parachute Category and Weight-Shift-Control Category, November 2023.
Flight Instructor Certificate with a Sport Pilot Rating; Powered Parachute Category Privileges, Weight-Shift-Control Aircraft Category Privileges.	
Instrument Rating—Airplane Instrument Proficiency Check—Airplane	FAA-S-ACS-8C, Instrument Rating—Airplane Airman Certification Standards, November 2023.
Instrument Rating—Helicopter Instrument Proficiency Check—Helicopter	FAA-S-ACS-14, Instrument Rating—Helicopter Airman Certification Standards, November 2023.
Instrument Rating—Powered-Lift Instrument Proficiency Check—Powered-Lift	FAA-S-ACS-3, Instrument Rating—Powered-Lift Airman Certification Standards, November 2023.
Flight Instructor Certificate; Airplane Category—Single Engine Rating Airplane Category—Multiengine Rating	FAA-S-ACS-25, Flight Instructor for Airplane Category Airman Certification Standards, November 2023.
Flight Instructor Certificate; Rotorcraft Category—Helicopter Rating	FAA-S-ACS-29, Flight Instructor for Rotorcraft Category Helicopter Rating Airman Certification Standards, November 2023.
Flight Instructor Certificate; Rotorcraft Category—Gyroplane Rating	FAA-S-8081-7C, Flight Instructor Practical Test Standards for Rotorcraft

	Category Gyroplane Rating, November 2023.
Flight Instructor Certificate; Powered-lift Category	FAA-S-ACS-27, Flight Instructor for Powered-Lift Category Airman Certification Standards, November 2023.
Flight Instructor Certificate; Glider Category	FAA-S-8081-8C, Flight Instructor Practical Test Standards for Glider Category, November 2023.
Flight Instructor Certificate; Instrument—Airplane Rating, Instrument—Helicopter Rating	FAA-S-8081-9E, Flight Instructor Instrument Practical Test Standards for Airplane Rating and Helicopter Rating, November 2023.
Flight Instructor Certificate; Instrument—Powered-Lift Rating	FAA-S-ACS-28, Flight Instructor—Instrument Rating Powered-Lift Airman Certification Standards, November 2023.
Aircraft Type Rating—Airplane	FAA-S-ACS-11A, Airline Transport Pilot and Type Rating for Airplane Category Airman Certification Standards, November 2023.
Aircraft Type Rating—Helicopter	FAA-S-8081-20A, Airline Transport Pilot and Aircraft Type Rating Practical Test Standards for Rotorcraft Category Helicopter Rating, November 2023.
Aircraft Type Rating—Powered-Lift	FAA-S-ACS-17, Airline Transport Pilot and Type Rating for Powered-Lift Category Airman Certification Standards, November 2023.
Pilot-in-Command Proficiency Check—Airplane	FAA-S-ACS-11A, Airline Transport Pilot and Type Rating for Airplane Category Airman Certification Standards; November 2023.
Pilot-in-Command Proficiency Check—Helicopter	FAA-S-8081-20A, Airline Transport Pilot and Aircraft Type Rating Practical Test Standards for Rotorcraft Category Helicopter Rating, November 2023.
Pilot-in-Command Proficiency Check—Powered-Lift	FAA-S-ACS-17, Airline Transport Pilot and Type Rating for Powered-Lift Category Airman Certification Standards, November 2023.

57. In addition to the preceding, amend part 61 by using the following table and, for each section in the left column, removing the text in the middle column wherever it appears, and adding in its place, the text in the right column:

14 CFR	**Remove**	**Replace**
a. § 61.1(b) *Student pilot seeking a sport pilot certificate (ii)*; b. § 61.89(c)(5); c. § 61.113(h) introductory text; d. § 61.327 section heading; e. § 61.412 section heading; f. § 61.415(e); g. § 61.415(f); h. § 61.415(g); i. § 61.423(a)(2)(iii)(C); and j. § 61.423(a)(2)(iii)(D); and	"a light sport aircraft"	"an aircraft"
a. § 61.23(c)(1)(i) through (iv); b. § 61.23(c)(2)(iv); c. § 61.89(c)(1); d. § 61.325 introductory text;	"a light-sport aircraft"	"an aircraft meeting the performance limits and design requirements of § 61.316"

e. § 61.327(a) introductory text and (b) introductory text; and f. § 61.411(a)(1)(v), (b)(1), (c)(1)(v), (d)(1)(v), (e)(1)(iii), (f)(1)(v) and (g)(1)(v); and		
a. § 61.317; b. § 61.325 section heading; c. § 61.327(a)(2) and (b)(2); d. § 61.403(b); e. 61.417; and f. § 61.423(a)(2)(iii)(A), (a)(2)(iv), and (b).	"light-sport"	

PART 65—CERTIFICATION: AIRMEN OTHER THAN FLIGHT CREWMEMBERS

58. The authority citation for part 65 continues to read as follows:

Authority: 49 U.S.C. 106(f), 40113, 44701-44703, 44707, 44709-44711, 45102-45103, 45301-45302.

59. Amend § 65.15 by revising paragraphs (a), (b), and (d) to read as follows:

§ 65.15 Duration of certificates.

(a) Except for repairman certificates issued in accordance with § 65.101, a certificate or rating issued under this part is effective until it is surrendered, suspended, or revoked.

(b) Unless it is sooner surrendered, suspended, or revoked, a repairman certificate issued in accordance with § 65.101 is effective until the holder is relieved from the duties for which the holder was employed and certificated.

* * * * *

(d) Except for temporary certificates issued under § 65.13, the holder of a paper certificate issued under this part may not exercise the privileges of that certificate.

60. Amend § 65.23 by revising the introductory text and paragraph (a)(3) to read as follows:

§ 65.23 Incorporation by reference.

Certain material is incorporated by reference into this part with the approval of the Director of the Federal Register under 5 U.S.C. 552(a) and 1 CFR part 51. This material is available for inspection at the Federal Aviation Administration (FAA) and at the National Archives and Records Administration (NARA). Contact FAA, Training and Certification Group, 202-267-1100, ACSPTSinquiries@faa.gov. For information on the availability of this material at NARA, email fr.inspection@nara.gov, or go to www.archives.gov/federal-register/cfr/ibr-locations. The material may be obtained from the source in the following paragraph of this section.

(a) * * *

(3) FAA–S–ACS–1, Aviation Mechanic General, Airframe, and Powerplant Airman Certification Standards, November 1, 2021; IBR approved for §§ 65.75, 65.79, and 65.107.

* * * * *

61. Revise § 65.81 to read as follows:

§ 65.81 General privileges and limitations.

(a) A certificated mechanic may perform or supervise the maintenance, preventive maintenance or alteration of an aircraft or appliance, or a part thereof, for which that person is rated (but excluding major repairs to, and major alterations of, propellers, and any repair to, or alteration of, instruments), and may perform additional duties in accordance with §§ 65.85, 65.87, and 65.95. However, a certificated mechanic may not supervise the maintenance, preventive maintenance, or alteration of, or approve for return to service, any aircraft or appliance, or part thereof, for which that person is rated unless that person has satisfactorily performed the work concerned at an earlier date. If that person has not so performed that work at an earlier date, that person may show the ability to do it by performing it to the satisfaction of the Administrator or under the direct supervision of a certificated and appropriately rated mechanic, or a certificated repairman, who has had previous experience in the specific operation concerned.

(b) A certificated mechanic may not exercise the privileges of that person's certificate and rating unless that person understands the current instructions of the manufacturer, and the maintenance manuals, for the specific operation concerned.

62. Revise § 65.85 to read as follows:

§ 65.85 Airframe rating; additional privileges.

(a) Except as provided in paragraph (b) of this section, a certificated mechanic with an airframe rating may approve for return to service an airframe, or any related part or appliance, after that person has performed, supervised, or inspected its maintenance or alteration (excluding major repairs and major alterations). In addition, a certificated mechanic with an airframe rating may perform the 100-hour inspection required by part 91 of this chapter on an airframe, or any related part or appliance, and approve for return to service.

(b) A certificated mechanic with an airframe rating can approve for return to service an airframe, or any related part or appliance, of an aircraft with a special airworthiness certificate in the light-sport category after performing and inspecting a major repair or major alteration for products that are not produced under an FAA approval provided the major repair or major alteration was authorized by, and performed in accordance with instructions developed by, the manufacturer or a person acceptable to the FAA.

63. Revise § 65.87 to read as follows:

§ 65.87 Powerplant rating; additional privileges.

(a) Except as provided in paragraph (b) of this section, a certificated mechanic with a powerplant rating may approve for return to service a powerplant or propeller or any related part or appliance, after that person has performed, supervised, or inspected its maintenance or alteration (excluding major repairs and major alterations). In addition, a certificated mechanic with a powerplant rating may perform the 100-hour inspection required by part 91 of this chapter on a powerplant or propeller, or any part thereof, and approve for return to service.

(b) A certificated mechanic with a powerplant rating can approve for return to service a powerplant or propeller, or any related part or appliance, of an aircraft with a special airworthiness certificate in the light-sport category after performing and inspecting a major repair or major alteration for products that are not produced under an FAA approval, provided the major repair or major alteration was authorized by, and performed in accordance with instructions developed by, the manufacturer or a person acceptable to the FAA.

64. Amend § 65.103 by revising paragraph (c) to read as follows:

§ 65.103 Repairman certificate: Privileges and limitations.

* * * * *

(c) This section does not apply to the holder of a repairman certificate (experimental aircraft builder) issued in accordance with § 65.104 or to the holder of a repairman certificate (light-sport) issued in accordance with § 65.107, while that repairman is performing work under that certificate.

65. Revise § 65.107 to read as follows:

§ 65.107 Repairman certificate (light-sport): Eligibility and training courses

(a) Ratings. The following ratings may be issued on a repairman certificate (light-sport) under this section:

(1) Inspection rating.

(2) Maintenance rating.

(b) Eligibility requirements: General. To be eligible for a repairman certificate (light-sport), a person must:

(1) Be at least 18 years old;

(2) Be able to read, speak, write, and understand English;

(3) Complete a training course pursuant to paragraph (c) or (d) of this section, as applicable to the rating sought;

(4) Pass a written test administered by the training course provider that covers the contents of the course pursuant to paragraph (c) or (d) of this section, as applicable to the rating sought; and

(5) Present documentary evidence of completion of the FAA-accepted training course required by paragraph (b)(3) and passage of the written test required by paragraph (b)(4) of this section, to the Administrator.

(c) Inspection rating training course. To obtain an inspection rating on a repairman certificate (light-sport), a person must complete a 16-hour training course accepted by the Administrator on inspecting the category, and class as applicable, of experimental aircraft for which the person intends to exercise the privileges of the rating.

(d) Maintenance rating training course. To obtain a maintenance rating on a repairman certificate (light-sport), a person must complete a training course accepted by the Administrator that includes content on, at a minimum, the knowledge, risk management, and skill elements for each subject contained in the Aviation Mechanic General, Airframe, and Powerplant Airman Certification Standards (incorporated by reference, see § 65.23), that are appropriate to the category, and class as applicable, of aircraft for which the person intends to exercise the privileges of the rating.

(e) Training course providers. Training course providers must:

(1) Deliver the training course described in paragraphs (c) and (d) of this section using facilities, equipment, and materials appropriate to the training course content taught;

(2) Use instructors that are appropriately qualified to teach the course content; and

(3) After a student completes the training course as required by paragraph (b)(3) of this section and passes the written test as required by paragraph (b)(4) of this section, provide a certificate of completion to the student indicating the:

(i) Name of the training provider;

(ii) FAA course acceptance number;

(iii) Rating applicable to the training course;

(iv) Aircraft category, and class as applicable, the training was based on; and

(v) Date of training completion.

(f) Certificate issuance and equivalency.

(1) A repairman certificate (light-sport) will be issued with category privileges, and may be issued with class limitations within the category sought pursuant to the completed training required by paragraph (b)(3) of this section.

(2) A repairman certificate (light-sport aircraft) that was issued before and was valid on [INSERT DATE 90 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER] is equivalent to a repairman certificate (light-sport) with the same ratings.

(3) Aircraft class privileges issued on a repairman certificate (light-sport aircraft) before and valid on [INSERT DATE 90 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER] are equivalent to aircraft category privileges, except as provided in paragraph (f)(4) of this section.

(4) A repairman certificate (light-sport aircraft) with an inspection rating and gyroplane class privileges issued before and valid on [INSERT DATE 90 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER] is equivalent to a

repairman (light-sport) certificate with an inspection rating and rotorcraft category privileges limited to the gyroplane class.

(g) Delayed Compliance. Inspection and maintenance rating training courses designed for glider class privileges and accepted prior to [INSERT DATE 90 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER] may not be offered by a training course provider after [INSERT DATE 365 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

66. Add § 65.109 to subpart E to read as follows:

§ 65.109 Repairman certificate (light-sport): Privileges and limitations.

(a) The holder of a repairman certificate (light-sport) with an inspection rating may perform the annual condition inspection on an aircraft:

(1) That is owned by the holder;

(2) That has an experimental airworthiness certificate issued in accordance with § 21.191(g), (i), (k), or (l) of this chapter; and

(3) That is in the same category, and class as applicable, of aircraft for which the holder has completed the training course specified in § 65.107(c) of this part.

(b) The holder of a repairman certificate (light-sport) with a maintenance rating may -

(1) Approve for return to service an aircraft that has a special airworthiness certificate in the light-sport category under § 21.190 of this chapter, or any part thereof, after performing or inspecting maintenance (to include the annual condition inspection and the 100-hour inspection required by § 91.327 of this chapter), preventive maintenance, or an alteration (excluding a major repair or a major alteration on a product produced under an FAA approval);

(2) Perform the annual condition inspection on an aircraft that has an experimental airworthiness certificate issued in accordance with § 21.191 (g), (i), (k), or (l) of this chapter; and

(3) Only perform maintenance, preventive maintenance, and an alteration on an aircraft that is in the same category, and class as applicable, of aircraft for which the holder has completed the training specified in § 65.107(d) of this part. Before performing a major repair, the holder must complete additional training acceptable to the FAA and appropriate to the repair performed.

(c) The holder of a repairman certificate (light-sport) with a maintenance rating may not approve for return to service any aircraft or part thereof unless that person has previously performed the work concerned satisfactorily. If that person has not previously performed that work, the person may show the ability to do the work by performing it to the satisfaction of the FAA, or by performing it under the direct supervision of a certificated and appropriately rated mechanic, or a certificated repairman, who has had previous experience in the specific operation concerned. The repairman may not exercise the privileges of the certificate unless the repairman understands the current instructions of the manufacturer and the maintenance manuals for the specific operation concerned.

PART 91—GENERAL OPERATING AND FLIGHT RULES

67. The authority citation for part 91 is revised to read as follows:

Authority: 49 U.S.C. 106(f), 40101, 40103, 40105, 40113, 40120, 44101, 44111, 44701, 44704, 44709, 44711, 44712, 44715,44716, 44717, 44722, 44740, 46306, 46315, 46316, 46504, 46506–46507, 47122, 47508,47528–47531, 47534; Pub. L. 112–95, 126 Stat. 11; Pub. L. 114–190, 130 Stat. 615 (49 U.S.C. 44703 note); Sec. 828 of Pub. L. 118-63, 138

Stat. 1330 (49 U.S.C. 44703 note); articles 12 and 29 of the Convention on International Civil Aviation, 61 Stat. 1180.

68. Amend § 91.113 by revising paragraphs (d)(2) through (4) to read as follows:

§ 91.113 Right-of-way rules: Except water operations.

* * * * *

(d) * * *

(2) A glider has the right-of-way over powered aircraft.

(3) An airship has the right-of-way over all other powered aircraft, except for an aircraft towing or refueling other aircraft.

(4) An aircraft towing or refueling other aircraft has the right-of-way over all other powered aircraft.

* * * * *

69. Amend § 91.126 by revising paragraphs (b)(1) and (2) to read as follows:

§ 91.126 Operating on or in the vicinity of an airport in Class G airspace.

* * * * *

(b) * * *

(1) Each pilot of a powered fixed-wing aircraft must make all turns to the left unless the airport displays approved light signals or visual markings indicating that turns should be made to the right, in which case the pilot must make all turns to the right; and

(2) Each pilot of any other powered aircraft must avoid the flow of the aircraft specified in paragraph (b)(1) of this section.

* * * * *

70. Amend § 91.309 by revising paragraph (a)(2) to read as follows:

§ 91.309 Towing: Gliders and unpowered ultralight vehicles.

(a) * * *

(2) The towing aircraft has:

(i) A standard airworthiness certificate and is equipped with a tow-hitch of a kind, and installed in a manner, that is approved by the Administrator;

(ii) A special airworthiness certificate for which a type certificate has been issued, and is equipped with a tow-hitch of a kind, and installed in a manner, that is approved or otherwise authorized by the Administrator; or

(iii) A special airworthiness certificate, for which the aircraft has not been previously issued a type certificate, and is equipped with a tow-hitch of a kind that is approved or otherwise acceptable to, and is installed in a manner acceptable to, the Administrator;

* * * * *

71. Effective [INSERT DATE 365 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER], amend § 91.313 by revising paragraphs (b)(3) and (e) introductory text to read as follows:

§ 91.313 Restricted category civil aircraft: Operating limitations.

* * * * *

(b) * * *

(3) Flights conducted to relocate the aircraft for delivery, repositioning, maintenance, or exhibition.

* * * * *

(e) Except when operating in accordance with the terms and conditions of a certificate of waiver or unless otherwise authorized by the Administrator in operating

limitations, no person may operate a restricted category civil aircraft within the United States—

* * * * *

72. Effective [INSERT DATE 365 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER], amend § 91.319 by revising paragraphs (a) introductory text, (b) introductory text, (c), (d) introductory text, (e), (f) introductory text, and (j), and adding paragraph (k) to read as follows:

§ 91.319 Aircraft having experimental airworthiness certificates: Operating Limitations:

(a) Except as provided in paragraph (k) of this section and § 91.326, no person may operate an aircraft that has an experimental airworthiness certificate—

* * * * *

(b) No person may operate an aircraft that has an experimental airworthiness certificate outside of an area assigned by the Administrator until it is shown that—

* * * * *

(c) Unless otherwise authorized by the Administrator in operating limitations, no person may operate an aircraft that has an experimental airworthiness certificate issued under § 21.191 of this chapter over a densely populated area or in a congested airway.

(d) Each person operating an aircraft that has an experimental airworthiness certificate shall—

* * * * *

(e) No person may operate an aircraft that is issued an experimental airworthiness certificate under § 21.191(i), (k), or (l) of this chapter for compensation or hire, except:

(1) A person may operate an aircraft issued an experimental airworthiness certificate under § 21.191(i)(1) of this chapter to tow a glider that is a light-sport category aircraft or unpowered ultralight vehicle in accordance with § 91.309; or

(2) A person may operate an aircraft issued an experimental airworthiness certificate under § 21.191(i), (k), or (l) of this chapter to conduct operations authorized under § 91.326.

(f) No person may lease an aircraft that is issued an experimental airworthiness certificate under § 21.191(i), (k), or (l) of this chapter, except –

* * * * *

(j) No person may operate an aircraft that has an experimental airworthiness certificate under § 61.113(i) of this chapter unless the aircraft is carrying not more than 7 occupants.

(k) A person may operate an aircraft issued an experimental airworthiness certificate to conduct a space support vehicle flight carrying persons or property for compensation or hire provided the operation is conducted in accordance with § 91.331 of this chapter.

73. Amend § 91.319 by revising paragraph (g) to read as follows:

§ 91.319 Aircraft having experimental airworthiness certificates: Operating Limitations:

* * * * *

(g) No person may operate an aircraft issued an experimental airworthiness certificate under § 21.191(i)(1) of this chapter to tow a glider that is a light-sport category aircraft or unpowered ultralight vehicle for compensation or hire or to conduct flight

training for compensation or hire in an aircraft which that person provides unless within the preceding 100 hours of time in service the aircraft has—

(1) Been inspected by a certificated repairman (light-sport) with a maintenance rating, an appropriately rated mechanic, or an appropriately rated repair station in accordance with inspection procedures developed by the aircraft manufacturer or a person acceptable to the FAA; or

(2) Received an inspection for the issuance of an airworthiness certificate in accordance with part 21 of this chapter.

* * * * *

74. Amend § 91.327 by revising the section heading and paragraphs (b), (c) introductory text, and (c)(1) to read as follows:

§ 91.327 Aircraft issued a special airworthiness certificate in the light-sport category: Operating limitations.

* * * * *

(b) No person may operate an aircraft that has a special airworthiness certificate in the light-sport category unless—

(1) The aircraft is maintained by a certificated repairman (light-sport) with a maintenance rating, an appropriately rated mechanic, or an appropriately rated repair station in accordance with the applicable provisions of part 43 of this chapter and maintenance and inspection procedures developed by the aircraft manufacturer or a person acceptable to the FAA;

(2) A condition inspection is performed once every 12 calendar months by a certificated repairman (light-sport) with a maintenance rating, an appropriately rated

mechanic, or an appropriately rated repair station in accordance with inspection procedures developed by the aircraft manufacturer or a person acceptable to the FAA;

(3) The owner or operator complies with all applicable airworthiness directives;

(4) Each repair or alteration to an aircraft meets the applicable and current FAA-accepted or approved consensus standards specified in the statement of compliance submitted to the FAA for the aircraft.

(5) Each major repair or major alteration to an aircraft product produced under a consensus standard is authorized by the manufacturer or a person acceptable to the FAA, and is performed and inspected in accordance with maintenance and inspection procedures developed by the manufacturer or a person acceptable to the FAA; and

(6) The owner or operator complies with the requirements for the recording of major repairs and major alterations performed on type-certificated products in accordance with § 43.9(d) of this chapter, and with the retention requirements in § 91.417.

(c) No person may operate an aircraft issued a special airworthiness certificate in the light-sport category to tow a glider or unpowered ultralight vehicle for compensation or hire or conduct flight training for compensation or hire in an aircraft which that person provides unless within the preceding 100 hours of time in service the aircraft has—

(1) Been inspected by a certificated repairman (light-sport) with a maintenance rating, an appropriately rated mechanic, or an appropriately rated repair station in accordance with inspection procedures developed by the aircraft manufacturer or maintenance and inspection procedures acceptable to the FAA and been approved for return to service in accordance with part 43 of this chapter; or

* * * * *

75. Effective [INSERT DATE 365 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER], amend § 91.327 by:

a. Revising paragraph (a);

b. Redesignating paragraph (f) as paragraph (g); and

c. Adding new paragraph (f).

The revisions and addition read as follows:

§ 91.327 Aircraft issued a special airworthiness certificate in the light-sport category: Operating limitations.

(a) No person may operate an aircraft that has a special airworthiness certificate in the light-sport category for compensation or hire except—

(1) To conduct any glider or an unpowered ultralight vehicle towing operations in accordance with § 91.309, that are specified in the aircraft's pilot operating handbook or operating limitations, as applicable, and specified in the manufacturer’s statement of compliance for the aircraft, in accordance with § 21.190 of this chapter;

(2) To conduct flight training, checking, and testing; or

(3) To conduct any aerial work operations specified in the aircraft’s pilot operating handbook or operating limitations, as applicable, and specified in the manufacturer’s statement of compliance for the aircraft, in accordance with § 21.190 of this chapter.

* * * * *

(f) No person may operate an aircraft issued a special airworthiness certificate in the light-sport category to carry –

(1) More than four occupants, including the pilot, if the aircraft is an airplane; or

(2) More than two occupants, including the pilot, if the aircraft is other than an airplane.

* * * * *

76. Effective [INSERT DATE 365 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER], add § 91.331 to subpart D to read as follows:

§ 91.331 Space support vehicle flights: Operating limitations.

(a) A person may operate an aircraft to conduct a space support vehicle flight carrying persons or property for compensation or hire provided—

(1) The aircraft has a special airworthiness certificate issued under § 21.191 of this chapter.

(2) The aircraft conducting the space support vehicle flight —

(i) Takes flight and lands at a single launch or reentry site that is operated by an entity licensed to operate the launch or reentry site under 51 U.S.C. chapter 509;

(ii) Is owned or operated by a launch or reentry vehicle operator licensed under 51 U.S.C. chapter 509, or on behalf of a launch or reentry vehicle operator licensed under 51 U.S.C. chapter 509;

(iii) Is a launch vehicle, a reentry vehicle, or a component of a launch or reentry vehicle licensed for operations pursuant to 51 U.S.C. chapter 509; and

(iv) Is used only to simulate space flight conditions in support of —

(A) Training for potential space flight participants, government astronauts, or crew (as those terms are defined in 51 U.S.C. chapter 509);

(B) The testing of hardware to be used in space flight; or

(C) Research and development tasks, which require the unique capabilities of the aircraft conducting the flight.

(b) The Administrator may prescribe additional operating limitations that the Administrator considers necessary in the interest of safety.

77. Amend § 91.409 by revising paragraph (c)(1) to read as follows:

§ 91.409 Inspections

* * * * *

(c) * * *

(1) An aircraft that carries a special flight permit, a current experimental airworthiness certificate, a special airworthiness certificate in the light-sport category, or provisional airworthiness certificate;

* * * * *

78. Amend § 91.417 by revising paragraph (a)(2)(v) to read as follows:

§ 91.417 Maintenance records.

(a) * * *

(2) * * *

(v) The current status of applicable airworthiness directives (AD) including, for each, the method of compliance, the AD number and revision date. If the AD involves recurring action, the time and date when the next action is required.

* * * * *

PART 119—CERTIFICATION: AIR CARRIERS AND COMMERCIAL OPERATIONS

79. The authority citation for part 119 is revised to read as follows:

Authority: 49 U.S.C. 106(f), 40101, 40102, 40103, 40113, 44105, 44106, 44111, 44701-44717, 44722, 44901, 44903, 44904, 44906, 44912, 44914, 44936, 44938, 46103, 46105; sec. 215, Pub. L. 111-216, 124 Stat. 2348.

80. Effective [INSERT DATE 365 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER], amend § 119.1 by:

a. Removing the word ‘‘or’’ at the end of paragraph (e)(10);

b. Removing the period at the end of paragraph (e)(11) and adding ‘‘; or’’ in its place; and

c. Adding paragraph (e)(12).

The addition reads as follows:

§ 119.1 Applicability.

* * * * *

(e) * * *

(12) Space support vehicle flights conducted under the provisions of § 91.331 of this chapter.

PART 147—AVIATION MAINTENANCE TECHNICIAN SCHOOLS

81. The authority citation for part 147 is revised to read as follows:

Authority: 49 U.S.C. 106(f), 40113, 44701-44702, 44707-44709; Sec. 135, Public Law 116-120, 134 Stat. 1182.

82. Amend § 147.17 by revising paragraph (b) to read as follows:

§ 147.17 Training requirements.

* * * * *

(b) FAA-S-ACS-1, Aviation Mechanic General, Airframe, and Powerplant Airman Certification Standards, November 1, 2021, is incorporated by reference into this section with the approval of the Director of the Federal Register under 5 U.S.C. 552(a) and 1 CFR part 51. This material is available for inspection at the Federal Aviation Administration (FAA) and the National Archives and Records Administration (NARA).

For information on the availability of this material at FAA, contact Training and Certification Group, 202-267-1100, ACSPTSinquiries@faa.gov. For information on the availability of this material at NARA, email: fr.inspection@nara.gov, or go to www.archives.gov/federal-register/cfr/ibr-locations. This material may be obtained from FAA, 800 Independence Avenue SW, Washington, DC 20591, 866-835-5322, www.faa.gov/training_testing.

Issued under authority provided by 49 U.S.C. 106(f), 44701(a), and 44703 in Washington, D.C.

Bryan K. Bedford,

Administrator.