

# Industry Vets FAA's Powered-Lift SFAR

By Mike Hirschberg, VFS Director of Strategy

In June, the US Federal Aviation Administration (FAA) published its proposed Special Federal Aviation Regulation (SFAR) entitled, “Integration of Powered-Lift: Pilot Certification and Operations; Miscellaneous Amendments Related to Rotorcraft and Airplanes.” These rules will apply to pilot training requirements for electric vertical takeoff and landing (eVTOL) and other aircraft that take off and land like a helicopter but fly on wing lift — such as the Leonardo AW609 — but the SFAR also has some significant impact on aircraft design as well.

The 160-page SFAR requirements had such a broad scope because of the FAA’s surprise decision in May 2022 to categorize wingborne eVTOL aircraft as Part 21.17(b) powered-lift special class aircraft. For nearly a decade prior to this pivot, the agency had indicated that winged eVTOL aircraft could be certificated as Part 23 “small airplanes” with special conditions (see “Commentary: FAA Changes Course on eVTOL Certification,” *Vertiflite*, July/Aug 2022). In fact, the FAA’s published Fall 2021 Unified Agenda had stated that it would “remove reference to the term powered-lift and designate applicability of current airplane operating regulations for aircraft formerly referred to as powered-lift category aircraft. This action is necessary to resolve discrepancies within the regulations, where powered-lift had been introduced in airmen regulations but not introduced for any of the associated operating regulations.”

This U-Turn to “powered-lift” caused extensive additional paperwork and delays for the eVTOL developers that were already in the certification process. It also caused extensive additional work for the understaffed agency, including creating operational rules for aircraft that are now being defined as neither airplanes nor rotorcraft.

The FAA, therefore, created the SFAR to “certify initial groups of powered-lift pilots, as well as determine which operating rules apply to powered-lift on a temporary basis to enable the FAA to gather additional information and determine the most appropriate permanent rulemaking path for these aircraft.” If the SFAR is enacted as written, it would dampen the momentum of the advanced air mobility (AAM) industry, as it would cause unreasonable development and operations costs, rather than facilitating initial operations to gather the necessary data to determine what next-generation eVTOL aircraft and larger-scale operations should be.

VFS engaged with numerous individuals, companies and associations over the 60-day comment period that ended Aug.



## Federal Aviation Administration

14, and found unprecedented agreement on the strengths and weaknesses of the document as published. Upon review of the extensive submissions by the General Aviation Manufacturers Association (GAMA) and National Business Aircraft Association (NBAA), VFS has officially endorsed their comprehensive findings and recommendations.

The GAMA comments were endorsed by the Aerospace Industries Association (AIA), Aircraft Owners and Pilots Association (AOPA), Experimental Aircraft Association (EAA), Helicopter Association International (HAI), National Air Transportation Association (NATA), National Business Aviation Association (NBAA) and VFS. The NBAA submission was endorsed by GAMA, HAI, NATA and VFS. HAI and many other associations also submitted independent comments that were all in general alignment — with the notable exception of the Air Line Pilots Association (ALPA) — that are summarized in the areas below.

VFS found that the proposed SFAR as written would stymie the initial fielding of AAM vehicles and overlook more expedient, tailored alternative approaches that would be safer than the SFAR’s inflexible prescriptive solutions.

Specifically, VFS urged the FAA to adopt a practical pathway for pilot qualification and operations, including, to the maximum extent practicable, alignment of powered-lift pilot qualification pathways with the International Civil Aviation Organization (ICAO) Convention on International Civil Aviation, Annex 1 (Personnel Licensing), as well as the recommendations contained in ICAO Document 10103 for powered-lift operations.

### Pilot Certification

The SFAR would mandate that pilots have an additional powered-lift category rating, rather than allowing helicopter and airplane pilots to add a type rating to their existing certificate, in contradiction to the International Standards and Recommended Practices of ICAO Annex 1, which the SFAR purported to follow.

The SFAR also requires pilots to build hours flying any aircraft in the powered-lift category, rather than building proficiency in

the actual aircraft for which the pilot is earning a type-rating. GAMA noted that, “The economic realities of operating a large powered-lift will incentivize an applicant to build this time in a lower-cost aircraft that might not be relevant to the aircraft they intend to operate commercially.” Thus, without allowing alternative approaches (see below), the requirement may result in a less safe outcome.

Most eVTOL aircraft are planning to operate as Part 135 Air Carriers, so pilots will have to have at least a commercial certificate.

VFS recommended the FAA follow the ICAO guidance for increased efficiency, and improved proficiency and safety.

### Dual-Control Trainer

The SFAR would require 35 hours of training with a pilot-in-command in a type-certificated, dual-control, powered-lift aircraft — of which none currently exists. Training pilots on high-fidelity simulators to add a type rating, in addition to an existing airplane or helicopter pilot certificate, would be a much safer and efficient means to maximize pilot training and safety.

As published, the proposed SFAR penalizes manufacturers who have incorporated highly augmented flight controls by proposing only one pathway for training on a type-certificated, dual-control, powered-lift aircraft.

To allow powered-lift pilot certification, a company building a single-pilot aircraft would first have to develop and certificate a new dual-control variant to train pilots. In either case, the controls and handling qualities would doubtlessly be different than the operational aircraft, providing a less safe training outcome. Even if a totally different powered-lift aircraft model with dual-controls (such as the AW609) had already received a type certificate, it would not be possible to get a type rating due to the dissimilarity, per the FAA’s type-rating policy.

Simulators provide safer training because they don’t expose pilots or instructors to actual risk, and support highly realistic scenario-based training. The FAA even recognizes this, as stated in the SFAR preamble: “flight simulators have proven to provide more in-depth training than can be accomplished in the aircraft. In particular, flight simulators allow training for emergency situations, such as fire, total loss of thrust, and systems failures that cannot be safely conducted in flight.”

Nearly 30 years ago, the Joint Strike Fighter (JSF) Program Office determined that a dual-seat trainer was not necessary, due to the then-state of the art of high-fidelity simulators and the highly augmented controls. This decision has been borne out in the excellent training safety of today’s F-35B Lightning II powered-

lift aircraft, for which no dual-control trainer exists. For more on this, see the VFS commentary, “FAA Should Heed 1990s Powered-Lift Training Decision,” published on Forbes.com on Aug. 10.

VFS urged the FAA to consider alternative approaches that would lead to safer outcomes than the prescriptive dual-control approach.

### Simulator Qualification

GAMA highlighted that the SFAR mandates the publication of powered-lift flight simulation training device (FSTD) qualification performance standards (QPS) in the Federal Register for public notice and comment, leading to significant timeline implications due to the nature of the rulemaking process. This could delay the critical path to entry-into-service beyond the initial certification of the first powered-lift aircraft, which directly contradicts the intended function of the SFAR. The SFAR inappropriately excludes deviation authorities as is currently used in FSTD qualification.

The SFAR as proposed is overly prescriptive and does not allow the FAA to account for emerging technology advancements in FSTDs, or competency-based training. There are many circumstances where a non-motion simulator may be suitable for a task that has been proposed for Level C simulation only. Innovations such as extended reality (ER), virtual reality (VR) or mixed reality (MR) devices also have the potential to provide comparable fidelity and representativeness to current Full Flight Simulators (FFSs).

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VFS recommended that the SFAR be modified to include statements that would grant the FAA Administrator the authority to approve an FSTD that is not a Level C FFS when it is determined to have comparable levels of fidelity. In addition, VFS urged the FAA to grant interim approval to simulators so AAM aircraft developers can begin training.

### Fuel Reserves

The operations rules in the SFAR were generally based on airplane rules, rather than the helicopters. Fuel reserves is one example of that, where the performance of powered-lift aircraft was not fully considered.

Powered-lift aircraft, like helicopters, have the ability to land nearly anywhere in case of emergency. In addition, charge status monitors on batteries are arguably more precise and accurate than helicopter fuel gauges that are in widespread use. Thus, the prescriptive solution for 30 minutes of “fuel reserves” for powered-lift aircraft flying in visual flight rules (VFR) based on conventional takeoff and landing aircraft vs. the 20-minute reserves for helicopters would be over-regulation, without a reasonable safety case.

Similarly, 45 minutes of reserves for flying in instrument flight rules (IFR) conditions like airplanes vs. the 30-minute reserves for helicopters, is also overly restrictive, well beyond any reasonable safety margin.

VFS urged the FAA to set requirements for powered-lift aircraft that reflect their operational intent and capabilities. As such they should meet the same VFR and IFR standards — as well as weather minimums and similar operational requirements — as other vertical landing aircraft certificated as Part 27 and Part 29 helicopters. This would be consistent with ICAO Document 10103.

### What Went Wrong?


When the FAA made its change to the powered-lift certification pathway last year, the agency stated on May 9, 2022, “The agency is working with applicants who currently have projects underway to ensure minimal disruption to their certification timeline. We do not expect this adjustment to our approach will add delay to completing type certification process and receiving operational approval.”

Agency officials stated at the time that there was “whole of agency” alignment behind this approach, from the acting administrator to the working level in the agency. The draft SFAR made it clear that this was not the case. It reads more like a “Frankenstein” document, where different offices wrote their

own sections that are not in harmony with the stated top-level objectives in the opening passages.

The FAA has done this before, with the incredible work required to certificate the AW609 that the contractors have faced for the past two decades, where each office (e.g., those responsible for Part 23, 25, 27, 29, etc.) has made its own demands, or the FAA declined to make agency-wide decisions to enable the airworthiness certification to proceed. Hopefully, with the powered-lift airworthiness and pilot certification requirements nearing finalization, the world’s first civil tiltrotor will finally reach entry into service.

The situation is also reminiscent of the Naval Air Systems Command (NAVAIR) working-level engineers who demanded much higher standards of certification justification for the V-22 Osprey in the 1990s and the VH-71 (AW101) Kestrel in the 2000s than the contract had required, significantly driving up the non-recurring engineering cost.

Hopefully, the “whole of industry” feedback to the FAA on this SFAR will inspire the FAA to publish a Final Rule that delivers on its promise of a “whole of agency” response to the promise of AAM. 

For links to the *Forbes.com* article and comments submitted by each association and company on the FAA’s Powered-Lift SFAR, go to the VFS resource page: [www.vtol.org/sfar](http://www.vtol.org/sfar).

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