FAA Powered-Lift Final Ruling

Overview

On October 22, 2024, the Federal Aviation Administration issued a final rule defining the first new civil aircraft category since the helicopter: powered-lift. Spanning 880 pages, the final ruling covers a breadth of topics including aircraft performance requirements and pilot training, providing the first definite path to commercialization in the United States for AAM passenger-taxiing.

The ruling has been received positively by industry stakeholders. Its aircraft performance requirements don't create any exceptional obstacles for AAM adoption, and the ruling's release months ahead of schedule is a show of good faith from the FAA that it will help the industry develop in the United States.

The Special Federal Aviation Regulation (SFAR) will be in effect for 10 years after taking effect in 2025, which will allow the FAA to gather data and revise its regulations to reflect the rapidly-changing and unprecedented nature of AAM.

Notable Decisions

- **Single Flight Control Set.** In a break from requirements that other training aircraft have dual flight controls for an instructor and student, the FAA will create three pathways for pilots to gain requisite experience in powered-lift vehicles without dual controls: shared flight controls between instructor and student; training performed exclusively via full flight simulator Level C or higher for those already with a commercial pilot certification and other qualification; and direct permission from the FAA to train with one set of controls if deemed safe in the future. This decision is crucial for OEMs like Joby and Archer, whose aircraft allows for only one set of flight controls and would have required a complete redesign to accommodate dual controls.
- **Performance Requirements.** The FAA will apply existing requirements towards powered-lift, drawing from airplane, helicopter, and rotorcraft performance. While mostly adhering to the more stringent airplane requirements, the FAA pulled from helicopter and rotorcraft requirements in a few key areas:
    - **Fuel Reserves.** The most notable shift in the final ruling is that most powered-lift aircraft will only require 20 minutes' worth of reserve fuel instead of 30-45 minutes, depending on operating conditions. This decrease in required energy reserves means AAM passenger-taxis will be able to service significantly longer routes, providing better mobility options and opening new markets for AAM.
    - **Minimum Flight Altitude.** For passenger-carrying operations, powered-lift vehicles that can autorotate or perform an equivalent safety maneuver have a

minimum flight altitude of 300 feet above structures. Otherwise, a 500 foot minimum altitude is required. This provides OEMs with greater flexibility in determining AAM flight paths. However, many OEMs, including Joby and Archer, have not demonstrated the capability to autorotate.

    - **Visual Flight Rules (VFR).** During vertical flight, powered-lift vehicles will be able to operate under helicopter VFR instead of airplane VFR, giving OEMs flexibility to fly in conditions with less visibility in specific circumstances.

- **Initial Pilot Training.** Each powered-lift vehicle will require its own type rating and specific training for pilots. The final ruling allows pilots from OEMs to earn necessary type ratings from the test flights needed in aircraft certification. These pilots will then go on to form the first group of flight instructors for various powered-lift aircraft.
- **Cross Country Flight.** The minimum flight distance for cross country commercial applicant training will be 50 nautical miles (as opposed to 100NM in other aircraft categories) to make training more reflective of powered-lift use cases and to enable aircraft with shorter ranges to comply with training requirements. The only route between airports in the Monterey Bay Region greater than 50NM is between Watsonville and King City.

Constraints and Concerns

While the SFAR is a boon to commercial AAM service and brings clarity to a number of pressing issues such as aircraft certification, pilot training, and performance requirements, the ruling is not without criticism and several questions remain.

- While many AAM stakeholders are supportive of the FAA's concessions to industry around the expanded use of flight simulators for pilot training, some argue that a less-rigorous path to powered-lift pilot certification increases the chances of human error and accident. Similarly, instances where the FAA will allow lower fuel reserves and minimum altitudes for powered-lift flight naturally pose a decrease in safety, and may be a target for criticism if an accident occurs during stages of commercialization.
- Many of the leniencies granted powered-lift performance requirements in the final ruling may not be ultimately applicable. For instance, a minimum operational altitude of 300 feet is only applicable if the aircraft can autorotate or perform an equivalent safety maneuver, something that most OEMs have not demonstrated with their aircraft.
- The SFAR only covers piloted powered-lift vehicles – excluding uncrewed or autonomous flight. More rulings by the FAA can be expected in the future as autonomous AAM develops.

Relevance to DART Ecosystem and Next Steps

The FAA's final ruling is free of any major obstacles that would set AAM commercialization back, paving the way towards type certification. The need for cross-country flight testing, both for aircraft certification and pilot training, is an opportunity to bring AAM operations to more general aviation airports in Northern California.

While the only flight path exceeding 50 nautical miles in the Monterey Bay Area is between Watsonville and King City, there is the potential for OEMs to work with other airports in the region to fly point-to-point.

OEMs can be expected to develop their pilot training programs in greater detail now that major points of uncertainty have been resolved, but the ruling forces no major shift in expectation to what OEMs were already planning for.

The FAA is continuing to release further clarification on their final ruling, providing advice for OEMs and pilots on how to best comply with it in AC 194-1 and AC 194-2 (see Relevant Materials).

Relevant Materials

FAA Announcement of Final Ruling

Final Ruling Full Document

FAA Final Ruling FAQ

AC 194-2: Information on Compliance for Powered Lift Pilot Training (11/21/2024)

AC 194-1: Information on Compliance for Powered Lift (10/7/2024)

Zag Daily article on industry response to ruling

Aviation Week article on history and development of powered-lift SFAR