

FAA AAM Certification Basis Familiarization and Status

Chiayi, Taiwan



Presented to: 2024 International UAS and AAM Certification Forum

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Date: September 26, 2024



Federal Aviation
Administration

Agenda

- **AAM certification and operational strategy**
- **Global alignment and harmonization activities**
- **Certification policy**



AAM Certification Strategy

- The FAA is taking a risk-based approach in certifying AAM aircraft
- This approach involves applying existing airworthiness standards where the risks posed are similar to traditional aircraft
- The FAA will utilize proven methods for ensuring the safety of complex systems
- The FAA is taking a deliberate policy position for AAM certification by using current projects to establish the groundwork for future published policy and rulemaking



Moving Towards Operations

Innovate 28 Initiative

- AAM Implementation Plan published July 2023

Concept of Operations

- UAM ConOps v2.0 published April 2023

Infrastructure Requirements

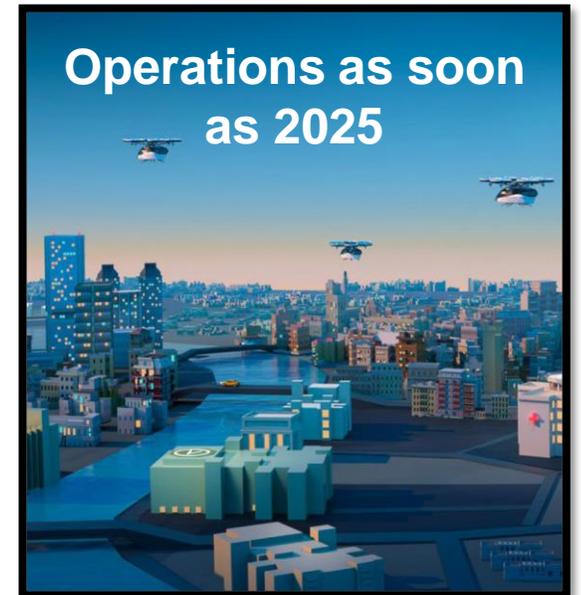
- Engineering Brief 105 (Vertiport Design) published Sept 2022

Aircraft Requirements

- AC 21.17-04 – Type certification – powered-lift

Operational Requirements

- Powered-Lift SFAR NPRM published June 2023



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Company & Aircraft Model	Description	
Alakai AH2-1	Hydrogen fuel cell special-class rotorcraft	
Archer Aviation Midnight	Electric powered-lift	
Beta Technologies Alia	Electric powered-lift	
Joby Aviation JAS4-1	Electric powered-lift	
Moog Surefly	Hybrid-electric special-class rotorcraft	
Overair Butterfly	Electric powered-lift	
Sabrewing Rhaegal-1-B	Hybrid-electric powered-lift (uncrewed)	
Supernal S-A1	Electric powered-lift	
Wisk Cora-X	Electric powered-lift (uncrewed)	

Harmonization Activities



- **EASA**
 - Volocopter – inbound validation
 - Lilium – inbound validation
- **UK CAA**
 - Joby Aviation – outbound validation
 - Vertical Aerospace – inbound validation
- **APAC AAM WG**
- **ANAC**
 - EVE – inbound validation
- **JCAB**
 - Joby Aviation – outbound validation
- **CASA – Australia**
 - Joby Aviation – outbound validation

AAM Airworthiness Criteria Update

- **Initial Publication – November 8, 2022**
- **Original Deadline – December 8, 2022**
- **Extended Deadline – December 22, 2022**
- **127 airworthiness requirements**
 - 66 aircraft level requirements
 - 40 engine level requirements
 - 21 propeller level requirements
- **Changes made to 43 requirements (33%)**
 - 29 aircraft level requirements modified (44%)
 - 13 engine level requirements modified (33%)
 - 2 propeller level requirements modified (10%)

DEPARTMENT OF TRANSPORTATION
Federal Aviation Administration

14 CFR Part 21

[Docket No. FAA-2021-0638]

**Airworthiness Criteria: Special Class
Airworthiness Criteria for the Joby
Aero, Inc. Model JAS4-1 Powered-Lift**

AGENCY: Federal Aviation
Administration (FAA), DOT.

ACTION: Notice of proposed
airworthiness criteria.

SUMMARY: The FAA announces the
availability of, and requests comments
on, the proposed airworthiness criteria
for the Joby Aero, Inc. (Joby) Model
JAS4-1 powered-lift. This document



Notable Airworthiness Criteria Updates

Aircraft Performance & Continued Safe Flight

- **Established two levels of performance (essential performance vs increased performance)**
 - “Essential performance” establishes the minimum safety objectives for issuance of a type certificate
 - “Increased performance” recognizes an elevated level of safety similar to the performance expectations of Category A rotorcraft
- **“Increased performance” requires the ability to continue flight to the planned destination or planned alternate**
- **Revision and addition of definitions for “controlled emergency landing” and “continued safe flight and landing”**

Powered-lift TC – AC 21.17-04

- Published on June 12, 2024
- Initial comment period extended to September 12, 2024
- Includes changes as an output to harmonization activities with EASA.
- Comments received from GAMA, ANAC, and others

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

[Docket No.: FAA-2024-1586]

Draft Advisory Circular for the Type Certification of Powered-Lift

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

ACTION: Notice of availability, request for comments; extension of comment period.

SUMMARY: On June 12, 2024, the FAA published in the **Federal Register** a notice of availability for draft Advisory Circular (AC) 21.17-04, “Type Certification of Powered-lift”. The

Powered-lift Safety Continuum

Maximum Passenger Seating Configuration and Maximum Gross Weight	Operations with Passengers for Comp/Hire Powered-Lift Certification Levels	No Operations with Passengers for Comp/Hire Powered-Lift Certification Levels
0-1 Passengers & ≤ 12,500 lbs.	1A	1B
2-6 Passengers & ≤ 12,500 lbs.	2A	2B
7-9 Passengers & ≤ 12,500 lbs.	3A	3B
10-19 Passengers or > 12,500 lbs.	4A	4B

Failure Condition Classification	<- No Effect ->	<--- Minor --->	<--- Major --->	< Hazardous >	<Catastrophic>
Effect on aircraft	No effect on operational capabilities or safety	Slight reduction in functional capabilities or safety margins	Significant reduction in functional capabilities or safety margin	Large reduction in functional capabilities or safety margins	Loss of aircraft
Effect on flightcrew	No effect on flightcrew	Slight increase in workload that involves crew actions well within crew capabilities such as routine flight plan changes	Physical discomfort or a significant increase in workload or in conditions impairing crew efficiency	Physical distress or excessive workload impairs ability to perform tasks accurately or completely	Fatalities or incapacitation
Effect on occupants excluding flightcrew	Inconvenience	Physical discomfort	Physical distress, possibly including injuries	Serious injuries or a fatal injury to a single passenger or cabin crew member	Multiple Fatalities
Probability Classification	No Probability Requirement	Probable	Remote	Extremely Remote	Extremely Improbable
Powered-Lift Certification Level 1B	No probability or FDAL requirement	<10 ⁻³ FDAL D	<10 ⁻⁴ FDAL D	<10 ⁻⁵ FDAL C	<10 ⁻⁶ FDAL C
Powered-Lift Certification Levels 1A and 2B	No probability or FDAL requirement	<10 ⁻³ FDAL D	<10 ⁻⁴ FDAL D	<10 ⁻⁶ FDAL C	<10 ⁻⁷ FDAL B
Powered-Lift Certification Levels 2A and 3B	No probability or FDAL requirement	<10 ⁻³ FDAL D	<10 ⁻⁵ FDAL C	<10 ⁻⁷ FDAL C	<10 ⁻⁸ FDAL B
Powered-Lift Certification Levels 3A, 4A, and 4B	No probability or FDAL requirement	<10 ⁻³ FDAL D	<10 ⁻⁵ FDAL C	<10 ⁻⁷ FDAL B	<10 ⁻⁹ FDAL A



Questions?

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Incoming FAA AIR Senior Representative for Asia Pacific

