Certification Discussion

Rules of the Game

Moderator: Earl Lawrence

- Dorenda Baker
- John Duncan
- Andy Thurling
- Todd Graetz

Send questions to talkUAS@faa.gov – include breakout session topic in subject line
• Development of Standards and Policy

• Certification and Production of aircraft, engines, propellers, aircraft parts and appliances;

• Continued operational safety (COS) management
AIR Organization

Transport Airplane Directorate

Small Airplane Directorate

Rotorcraft Directorate

Engine & Propeller Directorate

Directorate Offices
- Aircraft Certification Office
- Manufacturing Inspection District Office
- Manufacturing Inspection Satellite Office
- Manufacturing Inspection Office
- International Policy Office

Seattle

Kansas City

Ft. Worth

Anchorage

Bosten

Europe

Brussels

Frankfurt

Singapore
UAS Safety – From Experience

Successful history of integrating new technologies into the National Airspace System (NAS) safely

Proven risk-based approach to safety

 FAA will apply a risk-based approach to UAS Certification

 Balance of acceptable level of safety with societal safety demands
System Safety – The Safety Continuum

Too little rigor...
→ safety escapes
→ fatal accidents increase

SEEK
Establish appropriate balance in our regulatory approach
Achieve safety objectives while imposing the least burden on society

Too much rigor...
→ innovative safety enhancements don’t reach the fleet
→ Finite dollars that could be spent on safety enhancements go elsewhere
→ fatal accidents increase

Risk of accidents due to lack of safety innovation

Risk of accidents due to inadequate safety program

Total Risk

Risk

Extent of Safety Effort
Applying Our Safety Continuum

- Part 25 Transport Category Passenger Aircraft & UAS Risk Class 6
- Large Part 25 Business Jets
- Part 23 Commuter Aircraft & UAS Risk Class 6
- Part 23 Business Jets
- Part 23 Light Jets, Twins, & UAS Risk Class 5
- Part 23 Single Engine & UAS Risk Class 4
- Light Sport Aircraft & UAS Risk Class 3
- Amateur Built
- sUAS Risk Class 1 & 2
- Models

Society’s Demand for Safe Outcomes

Societally Accepted Risk & Desire for Low Cost

Level Of Cert Rigor

Zero Risk
No Operations
No Innovation
Existing Regulatory Framework

Part 21 Certification & Production Requirements

- Based on Typical Operations
  - UAS RC6 & Part 25
  - UAS RC5 & Part 23 Light Jets and Twin Engines
  - UAS RC4 & Part 23 Single Engine
    - F39 & F44 Industry Standards
  - UAS RC3 & LSA
    - F37 Industry Standards
  - UAS RC1 and RC2
    - F38 Industry Standards

Requirements are driven by risk and scalable based on risk assessments and CONOPS.

TC & PC Required

Certificate of Airworthiness

Pending Part 107

Part 21.17(b)

Hobbyist

Micro and 107 Operations

BVLOS/Extended Operations

Controlled Operations

Level of Oversight Rigor
Future Regulatory Continuum

Future State - Part 21 Certification & Production Requirements

- Pre-Decisional - Based on Typical Operations
  - UAS RC6 & Part 25
  - UAS RC5 & Part 23 Light Jets and Twin Engines
  - UAS RC4 & Part 23 Single Engine
  - F39 & F44 Industry Standards
  - F37 Industry Standards
  - UAS RC3 & LSA
  - F38 Industry Standards

Requirements are driven by risk and scalable based on risk assessments and CONOPs.

Levels of Oversight Rigor:
- No Airworthiness Certificate Required
  - Part 107
  - Part 21.19X
  - Part 21.17(b)

Globally Proposed Categories:
- Open
- Specific
- Certified

Production Oversight:
- Scalable
- TC & PC Required

Adherence to Industry Standards:
- Certificate of Airworthiness

Operations Categories:
- Hobbyist
- Micro and 107 Operations
- BVLOS/Extended Operations
- Controlled Operations
Scalable Production Oversight

• Establish production certificate (PC) risk categories similar to the type certificate (TC) risk classes
  – Current resources will not accommodate PCs for all UAS
  – Scalable approach allows the dedication of FAA resources where the risk is highest
Strategic Goal, Risk-Based Certification

Rising to the Challenge

• Creating Our Regulatory Continuum Now
  – Working pathfinders and 13 projects under the current regulatory structure
  – International Collaboration - ICAO, EASA, etc.

• Ready for the Future
  – Our certification projects inform future rule changes
  – Considering further changes for low and medium risk UAS

• Importance of Industry Engagement
  – Engage EARLY and OFTEN about new technologies
  – Upfront involvement will help the FAA determine the certification basis and get out of the critical path to certification

Open For Business! https://www.faa.gov/uas/
www.faa.gov/uas/

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The FAA’s mission is to protect life and property within the National Airspace System (NAS).

The Flight Standards Service fulfills its part of the FAA mission through:

- **Standards** (pilots, mechanics, air carriers, air operators, training facilities)
- **Certification** (“licensing” of those who meet standards)
- **Continued Operational Safety** (risk-based decision-making)

The goal of these functions is to provide protection for operators, passengers, and non-participants (people and property on the ground).
Regulatory Parts – Rules of the Road

Part 91 – General Operating Rules
Part 61 – Pilot Knowledge & Skill Requirements
Part 135 – Air Transportation – Small Aircraft
Part 121 – Air Transportation – Large Aircraft
Part 137 – Agricultural Operations
Part 133 – External Load Operations
Part 141 – Pilot Schools
The FAA did not envision UAS when today’s prescriptive civil aviation safety regulations were developed.

As UAS activity increased, the FAA recognized the need for integration of these aircraft into the NAS.

- We have begun to set standards for full integration of UAS, which will eventually be treated like any other aircraft.

- In the near term, the FAA is accommodating the demand for UAS operations by creating a niche in the NAS (part 107 and section 333 exemptions) to enable UAS activity.

  - This approach allows UAS to operate as the FAA works to create performance-based (vice prescriptive) standards that enable UAS operations.
Looking Ahead

• UAS are becoming more complex and more capable. We expect UAS to further evolve in size and complexity that will be comparable to that of manned aircraft.

• Next steps will involve expanding the scope of operations under part 107.

• To achieve the goal of full integration into the NAS, however, the FAA will have to make broad changes in the structure and scope of existing rules to accommodate UAS.

• These changes will shift regulations from the existing prescriptive approach to a performance-based standard.
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### Aviation Lifecycle

<table>
<thead>
<tr>
<th>Standards</th>
<th>Design</th>
<th>Produce</th>
<th>People</th>
<th>Operations</th>
<th>Maintenance</th>
<th>Continued Operational Safety</th>
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<tbody>
<tr>
<td>Establish safety and certification regulations and policy</td>
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<td>Provide guidance on ways to meet the intent of the regulations and policy</td>
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<td>Promote voluntary engagement and cooperation with enhanced safety programs</td>
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<tr>
<td>Determine design meets performance and certification standards</td>
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<td>Evaluate manufacturer's quality and production systems</td>
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<td>Issue production and airworthiness approvals for aircraft, engines, and parts</td>
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<td>Certify Airmen: Pilot, Mechanics</td>
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<td>Appoint Designees: Individual, Organization</td>
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<td>Approve Air Carrier operations</td>
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<td>Issue recurrent airworthiness certificates</td>
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<td>Approve Repair Stations and Maintenance Facilities</td>
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<td>Issue Repair Station Certificates</td>
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Continual Oversight and Surveillance of:
- Air Carriers
- Manufacturers
- Repair Stations
- Designees
- Airmen
- Air Traffic Organization

Apply tools to manage risk and gain compliance:
- Airworthiness Directives
- Precursor identification
- Data Sharing
- Enforcement

AVS is actively involved throughout the life-cycle of every aviation product