

ASTM INTERNATIONAL Helping our world work better

ASTM International Committee F38 on Unmanned Aircraft Systems

2016 ANSI Joint Member Forum Meeting

26 October 2016 Philip M. Kenul Chair, ASTM International Committee F38



ASTM International Committee F38

Vision

- Routine, safe UAS operations in civil airspace through standardization.
- Mission
 - Produce practical, consensus standards that facilitate UAS operations at an acceptable level of safety.
 - These standards include the design, manufacture, maintenance and operation of unmanned aircraft systems as well as the training and qualification of personnel.
 - Committee F38 supports industry, academia, government organizations and regulatory authorities.





Harmonizing sUAS Standards

Reduce duplication within global sUAS/sRPAS stakeholder community

ASTM F-38 participate in other efforts

- US: RTCA
- EU: WG-73/93
- Canada
- Global acceptance of ASTM sUAS standards is in best interest of the sUAS/sRPAS community
 - One set of standards worldwide
 - Benefit to buyers: Lowers acquisitions costs
 - Benefit to builders: Lowers manufacturing costs





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Structure

- F38.01 Airworthiness

- Product (hardware/software) oriented
 - Safe design, construction, test, modification, & inspection of the individual component, aircraft, or system

- F38.02 Operations

- Procedure/performance oriented
 - Safe employment of the system within the aviation environment among other aircraft & systems

- F38.03 Personnel

- Crew oriented

– Safe practices by the individuals responsible for employing the system



ASTM International Standards Worldwide Committee F38 on Unmanned Aircraft Systems

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A Spectrum of Standards & Regulations: Regulatory Burden Commensurate with Intended Function and Assumed Risks

Exempt from FARs by Definition Regulation by FAA-Recognized 3rd Party Involvement e.g., FAR Part 103 Regulation by Self-Declaration to FAA-Recognized Consensus Standards Light Sport Aircraft

Heavily Regulated Normal, Utility, Transport Categories

Kites Models



Sanctioned Industry Standards and Programs for Safe Construction and Operation USHPA SOPs



Consensus Standards are Primary Means of Establishing Compliance ASTM Committee F37



FAR Parts Supported by TSOs, Consensus Standards, and Formal TC/PC processes





FAA Part 107 sUAS – Opens market to Commercial Operations within limits

Key Elements of New Rule

- UAS < 55lbs
- Visual Line of Sight (LOS)
- Below 400ft
- Daytime
- Pilot must complete FAA sUAS written test and be certified (no medical requirement).
- UAS must be registered with FAA
- No airworthiness approval
- No flight over people or private property without permission
- FAA airworthiness certification not required.

LOWER BAR FOR STANDARDS





Potential Business and Non-Business Applications

- Crop monitoring/inspection;
- Research and development;
- Educational/academic uses;
- Power-line/pipeline inspection
- Antenna inspections;
- Search and Rescue;
- Bridge inspections;
- Aerial photography; and
- Wildlife survey.



FAA Focus Areas

The FAA is working with industry partners on three focus areas, including:

- Operations Over People CNN will look at how UAS might be safely used for newsgathering in populated areas.
- Extended visual line-of-sight operations in rural areas This concept involves UAS flights outside the pilot's direct vision. UAS manufacturer PrecisionHawk will explore how this might allow greater UAS use for crop monitoring in precision agriculture operations.
- Beyond visual line-of-sight in rural/isolated areas BNSF Railroad will explore command-and-control challenges of using UAS to inspect rail system infrastructure

What's Next? Waivers under Part 107 require a higher bar to meet equivalent level of safety

Other sUAS Standards in Development

- Operations over People
- Extended and Beyond Visual Line of Sight Operations
- Operational Risk Assessments
- Software Dependability
- Adaptive Algorithms
- Marking complex due to variety of aircraft
- Training of Pilots and Visual Observers
- Design, Construct, and Test (work underway on new standards)
 - Fixed wing
 - VTOL
- Micro UAS Requirements (TOR in work)

Parting Shot: Privacy and UAS

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Drone Captures Man Sunbathing on Wind Turbine

Acceptable Standards

Properly aligned with NPRM/Part 107

- FAA liaisons and process of FAA involvement
- Measurable/Testable
- Achievable (Realistic)
- Sufficient coverage that ensures sUAS can operate safely and reliably in the NAS
- Traceable from lowest level standard to stated objective/identified hazard
 - To be found acceptable, these standards will have to support a safety case

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