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

www.astm.org
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
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
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
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.*
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.
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

Philip Kenul
Vice Chairman
F38 UAS Committee
ASTM
301 346 5939
Philip.M.Kenul@noaa.gov
Philip.M.Kenul@Trivector.us

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