Unmanned Aircraft Systems (UAS)
Opportunities, Needs and Challenges

Presented to:
Scientific Committee for Oceanographic Aircraft Research (SCOAR)

Presented by:
CAPT Mike Wilson,
UAS Program Manager, Southern Region
FAA Aviation Safety Inspector

Date: April 15, 2015
Wright Brothers, Jet Engine...UAS?

• Industry forecasts indicate potential worldwide market for commercial and military UAS at nearly $90 billion over next decade
FAA UAS Integration Office, AFS-80

Single POC for All-Things UAS

- To promote UAS-NAS integration, the FAA established a division-level organization reporting to the Director of Flight Standards
- Single agency executive focal point
- Matrixed organization with staff from Air Traffic and Flight Standards
- Primary sponsoring office for FAA UAS research and development
- Coordinates Certificate of Waiver or Authorization (COA) processing
- Publishes UAS Civil Integration Roadmap
- Processes Section 333 petitions for exemption
## FAA Vision for UAS Integration

Safe, Efficient, and Timely integration of UAS into the national airspace

<table>
<thead>
<tr>
<th>SAFE</th>
<th>Because safety is the FAA’s primary mission</th>
</tr>
</thead>
<tbody>
<tr>
<td>EFFICIENT</td>
<td>FAA is committed to reduce delays and increase system reliability</td>
</tr>
<tr>
<td>TIMELY</td>
<td>FAA is dedicated to supporting this exciting new technology</td>
</tr>
</tbody>
</table>
UAS: Friend or Foe?
What are UAS?

• Unmanned Aircraft Systems (UAS) historically were called by various terms:
  – drone/RPA/ROA/RPV/UAV Model/R-C
• FAA defines UAS as a system
  a) Unmanned Aircraft (UA)
  b) Aircraft Control Station
  c) Command & Control Link/s
  d) Pilot
Who is Operating UAS in the National Airspace System (NAS)?*

**Public (Governmental) Use Aircraft – via Certificate of Waiver or Authorization (COA)**
- Department of Agriculture
- Department of Commerce
- Department of Defense
- Department of Energy
- Department of Homeland Security
- Department of Interior
- Department of Justice
- NASA
- State Universities
- Federal/State/Local Law Enforcement

**Civil Aircraft – via Special Airworthiness Certificates in the Experimental Category and Special Flight Permits**
- Insitu
- Aerovironment
- Raytheon
- AAI Corporation
- General Atomics
- Boeing
- Others

**Civil Aircraft – via Section 333 Exemption and COA for Limited, Low-Risk Commercial Operations**
- Television/Movie Filming
- Precision and Aerial Survey
- Flare Stack Inspection
- Construction Monitoring
- Agriculture
- Real Estate
- Others

* FAA has approved limited small UAS commercial operations in Arctic
Who Operates UAS?

• **Private**
  - Recreational Operators (Hobbyists)
  - Operations below 400'/Remote Area/5 miles from airport
  - Not for commercial operations (compensation or hire)

• **Civil**
  - An entity other than public requiring:
    • A S A C Ex or Restricted
    • An Exemption IAW Section 333 of PL 112-95
  - No commercial operations (compensation or hire) unless stipulated in terms and conditions of Exemption or Restricted SAC

• **Public**
  - Intrinsically governmental in nature (i.e. federal, state, and local agencies)
  - Operator must qualify as public entity
  - Operation must qualify as government function (public interest)
  - Examples: Department of Defense (DoD); other local, state, and federal government agencies and some universities
Where are UAS Operating?

- UAS are operated in most classes of airspace (not Class B)
- Flight over populated areas must be approved on a case-by-case basis
UAS Flying Decision Matrix
Proponent Breakdown

COA Applications Submitted by Proponent CY14

- DOD: 42%
- Test Sites: 18%
- Law Enforcement: 28%
- Academia: 8%
- Other: 4%
UAS Center of Excellence

• Selection process underway  
  – award announcement expected in FY 2015

• Per FY 2015 appropriation, base funding doubled to $1 million

• Expected to perform any required flight testing at one or more of the six Congressionally-mandated Test Sites
UAS Test Sites

- University of Alaska
  - Includes test ranges in Hawaii and Oregon
  - Operational May 5, 2014
- State of Nevada
  - Operational June 9, 2014
- New York Griffiss International Airport
  - Includes test ranges in Massachusetts
  - Operational August 7, 2014
- North Dakota Department of Commerce
  - Operational April 21, 2014
- Texas A&M University – Corpus Christi
  - Operational June 20, 2014
- Virginia Polytechnic Institute and State University (Virginia Tech)
  - Includes test ranges in New Jersey (partnered with Rutgers University) and Maryland
  - Operational August 13, 2014

http://www.faa.gov/uas/legislative_programs/test_sites/
Potential Areas for Section 333

- Filming
- Power Line Inspection
- Precision Agriculture
- Flare Stack Inspection
Section 333 Petitions for Exemption

• Required by Section 333 of the PL 112-95 (FMRA)
• Bridge for commercial UAS operations before finalization of small UAS rule based on OST process
• Over 600 petitions for exemption since 12/1 139 approvals as of 4/8/15
• Must comply with T’s & C’s
• Letter to local FSDO for “planned activities”
• Broad Area COA for location

http://www.faa.gov/uas/legislative_programs/section_333/
Broad Area CoA

- ATO Memo of 3/20/15 with Press Release of new interim policy
- Allows ops at or below 200’ w/o coordination
- Proponent must agree to op w/i established parameters contained in 333
  - Must meet requirements of Class Airspace ops
  - < 55 #, Daylight VFR, and VLOS
  - Issue NOTAM 24 hours prior
  - PIC must have PPL: Reduced to Sport or Rec Cert
  - Commercial Ops must remain at least:
    - 5NM from airport with op tower
    - 3NM from airport with pub instrument flight procedure but not op tower
    - 2NM from airport, seaport, heliport w/o IFC or Tower
Education, Compliance and Enforcement

• **Notice to Aviation Inspectors issued July 2014**
  – stresses education as primary approach vs. enforcement

• **Compliance and Enforcement Bulletin published January 2015**
  – defines authorized vs. unauthorized operations
  – outlines actions for violators

• **Enforcement may be used for persons who operate any UAS:**
  – in violation of the Federal Aviation Regulations (FARs)
  – in a manner that endangers the safety of the NAS or people and property on the ground

• **Additional enforcement tools include:**
  – warning notices, Letters of correction, Civil penalties
“Know Before You Fly” Outreach Campaign

• Announced December 22, 2014
  – provides prospective UAS users with information and guidance to fly safely and responsibly
  – founding members: AUVSI, Academy of Model Aeronautics (AMA) and the Small UAV Coalition
  – partnered with FAA
  – other Supporters include:
    • Consumer Electronics Association (CEA) – January 7, 2015
    • Experimental Aircraft Association (EAA) – January 9, 2015

www.knowbeforeyoufly.org
Small UAS NPRM

• Outlines major provisions of proposed Small UAS Rule (Part 107):
  – Operational Limitations
  – Operator Certification and Responsibilities
  – Aircraft Requirements
  – Model Aircraft

• Small commercial UAS projected to be largest growth sector
Small UAS NPRM—Major Highlights

- Must see and avoid manned aircraft
  - UAS must be first to maneuver away if collision risk arises
- Must discontinue flight in event of presenting a hazard to other aircraft, people or property
- Must assess risks presented by:
  - Weather conditions
  - Airspace restrictions
  - Location of people
- May not fly over people, except those directly involved with the operation
- Flights limited to:
  - 500 feet altitude
  - 100 mph
- Must avoid airport flight paths and restricted airspace areas
- Must obey any FAA Temporary Flight Restrictions (TFRs)
- Potential for MicroUAS (<4.4#)
Questions?
UAS Resources

- FAA UAS Website: www.faa.gov/uas
- FAA Inspectors: N8900.1 Volume 16
- FAA C&E: Order 8900.268
- Air Traffic Order: JO 7210.873(ATO)
- Section 333: www.fedreg.gov
- PTRS

Contact:

Mike Wilson
UAS Program Manager
Southern Region, ASO-220
Mike.Wilson@faa.gov
404.305.6038