Unmanned Aircraft Systems (UAS)

UAS 101

Presented by: FAA Safety Team (FAASTeam)

Overview

- UAS Integration
- UAS uses– Who, What, Why, How & Where,
- FAA – Roles & Authority
- sUAS Proposed Rule
- Safety Concerns
- Education, Compliance & Enforcement
- Final Thoughts

FAA UAS Integration Office, AFS-80

Single POC for All-Things UAS

- Mission: promote UAS-NAS integration
- Staffed from Air Traffic and Flight Standards
- Primary sponsoring office for FAA UAS research and development
- Certificates of Waiver or Authorization (COA)
- Section 333 petitions for exemption
- New small-UAS rule (NPRM)
- Publishes UAS Civil Integration Roadmap

Website: www.faa.gov/uas

FAA Vision for UAS Integration

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

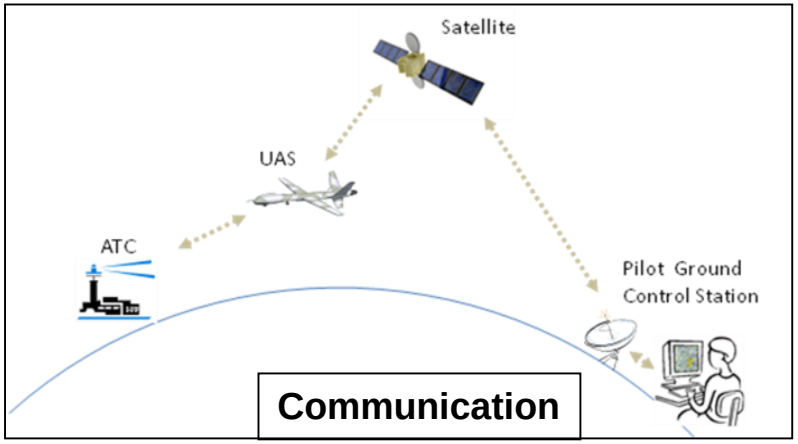
SAFE	Because safety is the FAA's primary mission
EFFICIENT	FAA is committed to reduce delays and increase system reliability
TIMELY	FAA is dedicated to supporting this exciting new technology

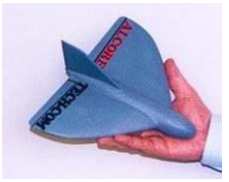
A Look Ahead for FAA

- **Today: *Accommodation***
  - Improve FAA UAS approval guidance and process for government and civil
  - Plan/oversee research and development activities through the UAS Test Sites
  - Gather safety data
  - Grant exemptions on case-by-case basis until small UAS rule is final
- **Mid-term: Transition to NAS Integration – *Initial***
  - Increase NAS access through small UAS rule
  - Implement advanced mitigations (Ground Based Sense and Avoid (GBSAA), others
- **Long-term: Integration into the NAS – *Routine***
  - Amend operational regulations
  - Accomplish other rulemaking activities, as needed
  - Reduce dependency on individual approvals
  - Integration into the NextGen environment

What are UAS?

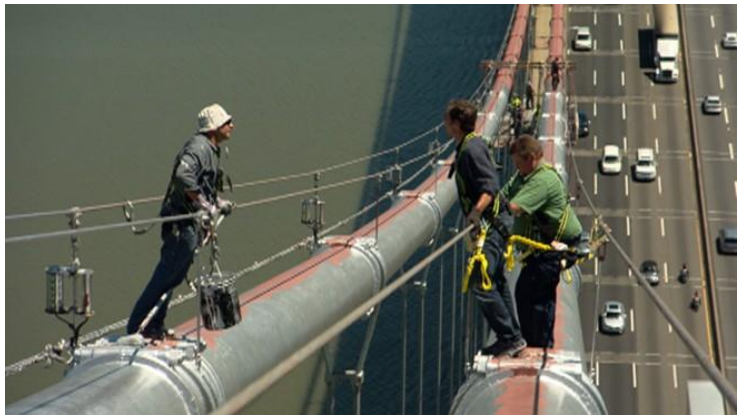
- **Unmanned Aircraft Systems (UAS) historically were called by various terms:**
  - Drone/RPA/ROA/RPV/UAV Model/R-C
- **FAA defines UAS as a *system***
  - Unmanned Aircraft (UA)
  - Aircraft Control Station
  - Command & Control Link/s
  - Pilot





Why UAS?

- **UAS operations are particularly effective for missions that are dangerous or dull**
  - Humans not put at risk
  - Continuous operations
- **UAS operations often cost less than manned aircraft**



The Role of FAA

- **FAA is a *Regulator***
  - Assures the safety of all aircraft, people, and property
- **FAA is a *Service Provider***
  - Ensures the safety and efficiency of the National Airspace System and international airspace delegated to U.S.
- **Successful UAS Integration requires *BOTH* roles**
  - FAA established a single integration office

FAA Authority

- **U.S. airspace is public space**
  - 49 U.S.C. §40102(a)(1)
- **UAS are aircraft subject to regulation**
  - 49 U.S.C. §40102(a)(6); 14 CFR 1.1; PL 112-95 §331, §336
  - An aircraft is any device used for flight.
- **UAS must comply with regulations that apply to all aircraft**
  - Some state and local laws may impact UAS

Types of Authorization

- **Public Aircraft Operations**
  - U.S. or State Government, or subdivision
  - Aircraft owned, or exclusively leased for 90 days
  - Performing only government functions
  - Agency self-certifies aircraft and crew
  - FAA issues a Certificate of Authorization (COA) since UAS cannot meet certain rules

Types of Authorization

- **Civil aircraft operations**
  - Airworthiness Certificate
    - Special – Experimental Category: R&D, crew training, market survey
    - Type – Restricted Category: commercial use of military UAS
    - Standard Type Certificate under Part 21.17 (b)
  - Exemption under Section 333 of P.L. 112-95:
    - Relieved from statutory requirement for airworthiness
    - COA required for specific location of operation
  - Aircraft must be registered, display markings ("N-number") as large as possible/practical
    - See 49 U.S.C. §§ 44101-44104 & 14 CFR part 47

Civil Authorization – Section 333 Exemptions

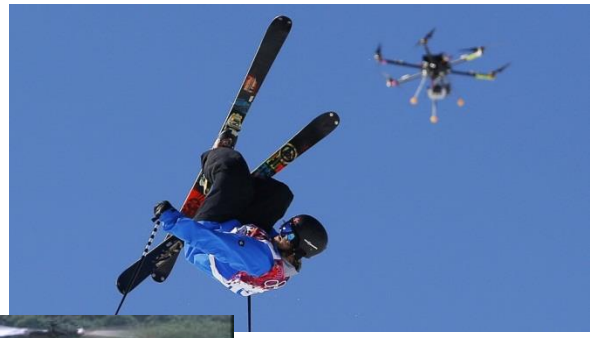
- **Public Law 112-95 Sec. 333**
  - Secretary of Transportation determines if a UAS without airworthiness can operate in the NAS without compromising safety
  - Petitions for Exemption per 14 CFR part 11 (public rulemaking process)
  - Additional information available at http://www.faa.gov/uas/legislative_programs/section_333/
    - Links to apply and examples of previous applications
  - Interest is robust; streamlined process implemented in March 2015

Potential Areas for Section 333

FILMING | POWER LINE INSPECTION | PRECISION AGRICULTURE | FLARE STACK INSPECTION

Proposed Small UAS Rule

- **Currently in DRAFT**
  - Notice of Proposed Rulemaking (NPRM) Published to Federal Register on February 23, 2015
  - Public comment period closed on April 24, 2015
    - Produced approximately 4,500 public comments
- **Small commercial UAS projected to be largest growth sector**



Proposed Small UAS Rule: Major Provisions

- **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)**

New World for Recreational Aircraft

- **Model aircraft have been around for decades, but there are new entrants into the recreational community**
  - These types of aircraft may be purchased at a hobby shop or online for a few hundred dollars
  - Many of these new recreational operators do not have aviation experience, and may not know FAA model aircraft guidelines (AC 91-57A):
    - Avoid manned aircraft
    - Remain within visual line of sight

Model Aircraft Operations

PL 112-95 §336 requires a model aircraft be:

- Flown for hobby/recreation only
- Operated in accordance with a community based organization's safety guidelines
- Be less than 55 lbs.
- Always give way to manned aircraft
- The operator notify the airport and control tower before flying within 5 miles of an airport

Current Safety Concerns – Unsafe UAS Operations

- **Reports from pilots in flight of UAS operations near airports/manned aircraft**
  - Greater awareness has led to better reporting
  - Each report is investigated and documented
- **Reports of UAS flying during sporting events**
  - TFR FDC NOTAM 4/3621 issued to restrict all aircraft operations around major sporting events, stadiums seating 30,000 people
  - TFR specifically cites UAS as aircraft
- **Reports of UAS flying over wildfires**
  - TFRs around West Coast wildfires restrict UAS operations

So what are we doing about this?

Interpretive Rule

- **FAA published guidance in June 2014 after incidents involving the reckless use of unmanned model aircraft near airports and involving large crowds of people**
- **This guidance clarifies that:**
  1. Model aircraft must satisfy the criteria in the Act to qualify as model aircraft and to be exempt from future FAA rulemaking action
  2. Consistent with the Act, if a model aircraft operator endangers the safety of the NAS, the FAA has the authority to take enforcement action against those operators for safety violations
- **Public comment period produced more than 30,000 comments**
- **Status: FAA evaluating comments to determine where clarification is needed**

https://www.federalregister.gov/articles/2014/06/25/2014-14948/interpretation-of-the-special-rule-for-model-aircraft

Education, Compliance and Enforcement

- **FAA's primary approach to new UAS operators is education**
- **FAA has authority to take enforcement action against any persons who operate a 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
- **Enforcement tools include:**
  - Warning notices, letters of correction, civil penalties

Know Before You Fly 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
- **FAA reached voluntary agreement with UAS manufacturers to include guidance materials in packaging**
  - DJI, Parrot and Yuneec Electrical Aviation

www.knowbeforeyoufly.org

B4UFLY Mobile App

- **Announced at AUVSI Unmanned Systems 2015 on May 6**
- **Designed to provide model aircraft situational awareness of any restrictions or requirements prior to flight**
- **Limited beta test began**

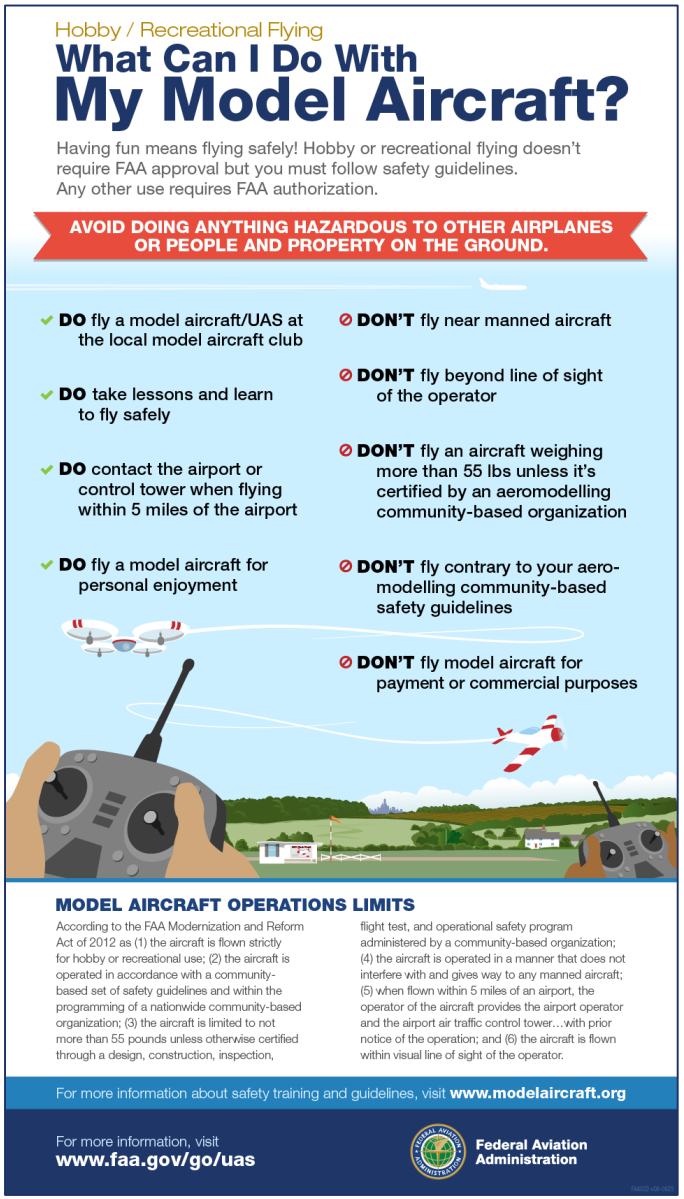
  August 28
  - 1,000 users
  - Will last two months, then available to general public
  - Initially iOS; Android version to follow

No Drone Zone Campaign

- **Education about federal rules prohibiting aircraft from operating in the Flight Restricted Zone around Washington, DC**
- **Digital toolkit of outreach materials available to partners**
- **Cross-agency outreach effort**

Other Outreach

- **FAA published infographic to accompany Interpretive Rule for Model Aircraft**
- **Online at: http://www.faa.gov/uas/publications/model_aircraft_operators/**
- **FAA has also produced two informational videos**
  - Online on the FAA's *YouTube* channel



Hobby / Recreational Flying

What Can I Do With My Model Aircraft?

Having fun means flying safely! Hobby or recreational flying doesn't require FAA approval but you must follow safety guidelines. Any other use requires FAA authorization.

AVOID DOING ANYTHING HAZARDOUS TO OTHER AIRPLANES OR PEOPLE AND PROPERTY ON THE GROUND.

- ✔ **DO** fly a model aircraft/UAS at the local model aircraft club
- ✔ **DO** take lessons and learn to fly safely
- ✔ **DO** contact the airport or control tower when flying within 5 miles of the airport
- ✔ **DO** fly a model aircraft for personal enjoyment
- ⊘ **DON'T** fly near manned aircraft
- ⊘ **DON'T** fly beyond line of sight of the operator
- ⊘ **DON'T** fly an aircraft weighing more than 55 lbs unless it's certified by an aeromodelling community-based organization
- ⊘ **DON'T** fly contrary to your aero-modelling community-based safety guidelines
- ⊘ **DON'T** fly model aircraft for payment or commercial purposes

MODEL AIRCRAFT OPERATIONS LIMITS

According to the FAA Modernization and Reform Act of 2012 as (1) the aircraft is flown strictly for hobby or recreational use; (2) the aircraft is operated in accordance with a community-based set of safety guidelines and within the programming of a nationwide community-based organization; (3) the aircraft is limited to not more than 55 pounds unless otherwise certified through a design, construction, inspection, flight test, and operational safety program administered by a community-based organization; (4) the aircraft is operated in a manner that does not interfere with and gives way to any manned aircraft; (5) when flown within 5 miles of an airport, the operator of the aircraft provides the airport operator and the airport air traffic control tower…with prior notice of the operation; and (6) the aircraft is flown within visual line of sight of the operator.

For more information about safety training and guidelines, visit **www.modelaircraft.org**

For more information, visit **www.faa.gov/go/uas**

Federal Aviation Administration

Final Thoughts

- All UAS are aircraft
- Model aircraft are to be flown for hobby or recreation only – no related business aspects
- All aircraft share the same airspace – communicate, avoid airspace conflicts, and maintain line-of-sight of your aircraft
- The UAS operator is responsible for knowing the rules and flying safely – be aware of any requirements or restrictions BEFORE taking off
- Questions – visit www.faa.gov/uas or ask the FAA

Report Unsafe UAS Activity!

- **While flying or at the airport:**
  - Report the sighting to Air Traffic Control
  - Report to ATC or FAA Safety Hotline (866-835-5322) once on the ground
    - Note the location, altitude, and characteristics of the aircraft
- **Anywhere else:**
  - Call local law enforcement
  - Report to FAA Safety Hotline (866-835-5322)
- **Be as detailed & specific as possible**
  - Location, altitude, direction, pictures, videos, etc.

Questions?

Contact your local FSDO

(Flight Standards District Office)

www.faa.gov/about/office_org/field_offices/fsdo/