Unmanned Aircraft Systems (UAS)

Opportunities, Needs and Challenges

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

Presented by:
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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

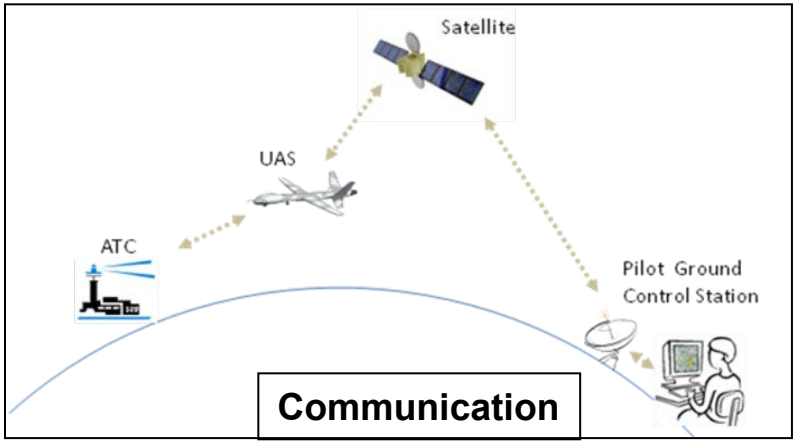
Safe, Efficient, and Timely integration of UAS into the national airspace

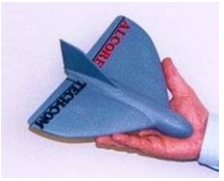
SAFE	Because safety is the FAA's primary mission
EFFICIENT	FAA is committed to reduce delays and increase system reliability
TIMELY	FAA is dedicated to supporting this exciting new technology

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?

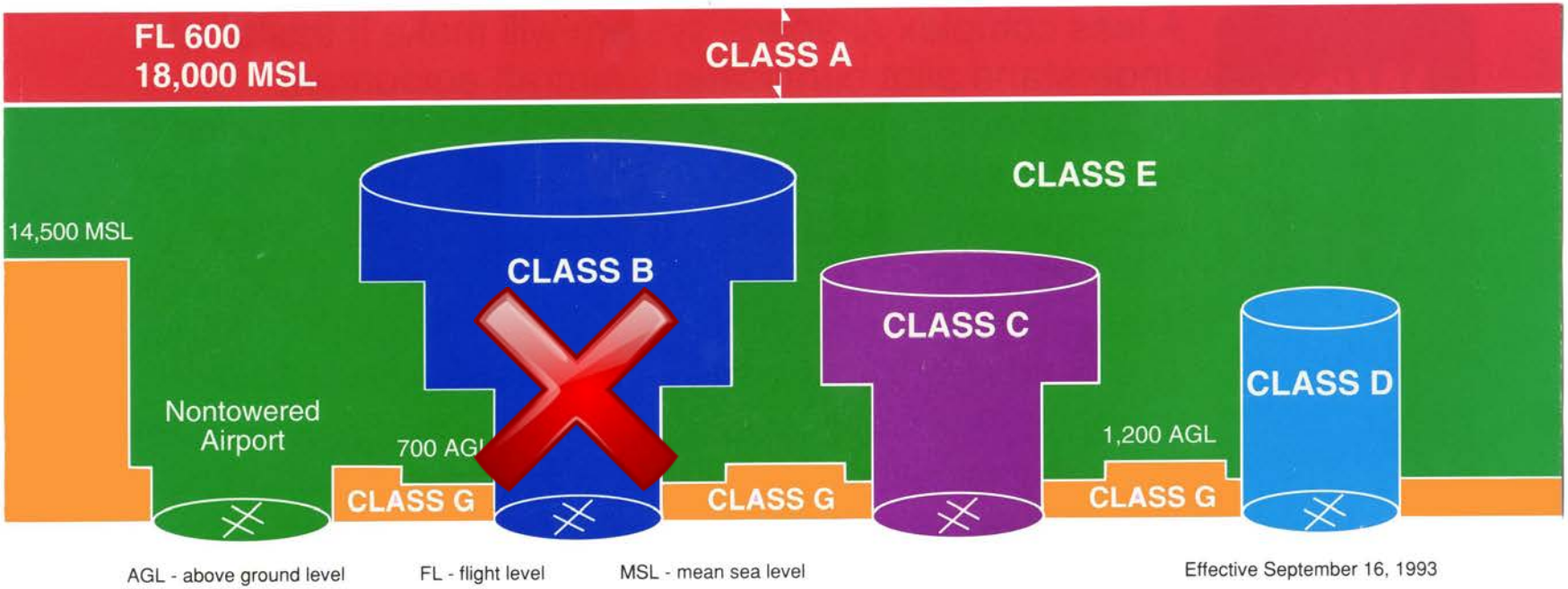
- **Private**
  - Recreational Operators (Hobbyists)
  - Operations below 400'/Remote Area/5 miles from airport
  - Not for commercial operations (compensation or hire)

- **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)

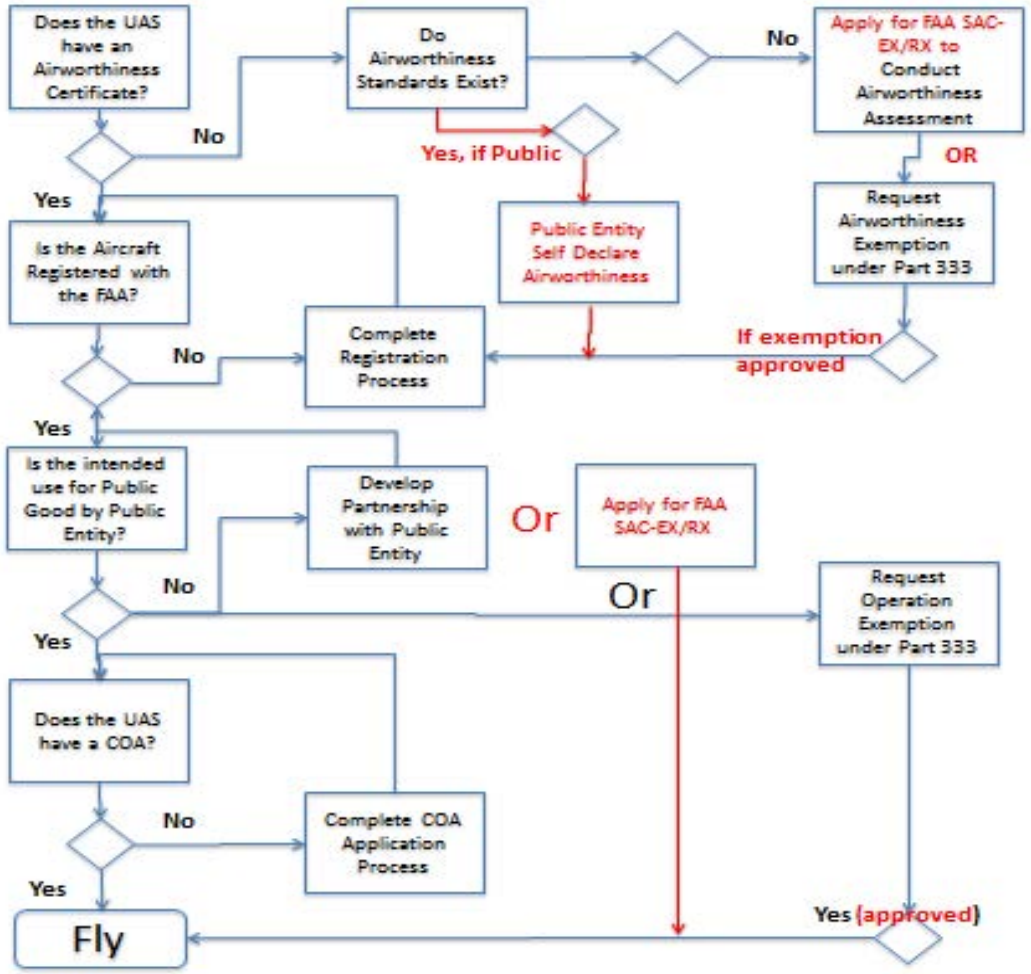
  Examples: Department of Defense (DoD); other local, state, and federal government agencies and some universities

Where are UAS Operating?

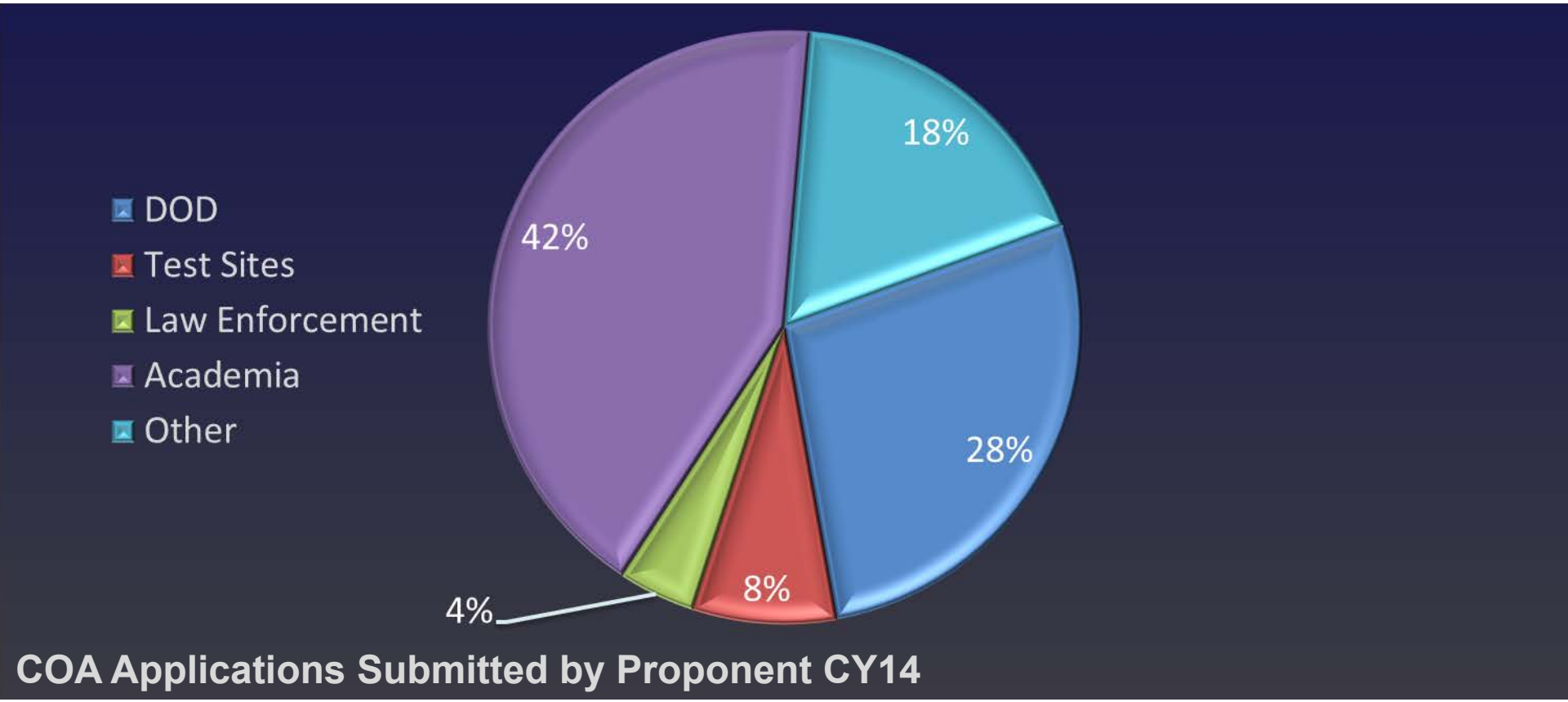


- **UAS are operated in most classes of airspace (not Class B)**
- **Flight over populated areas must be approved on a case-by-case basis**

UAS Flying Decision Matrix



Proponent Breakdown

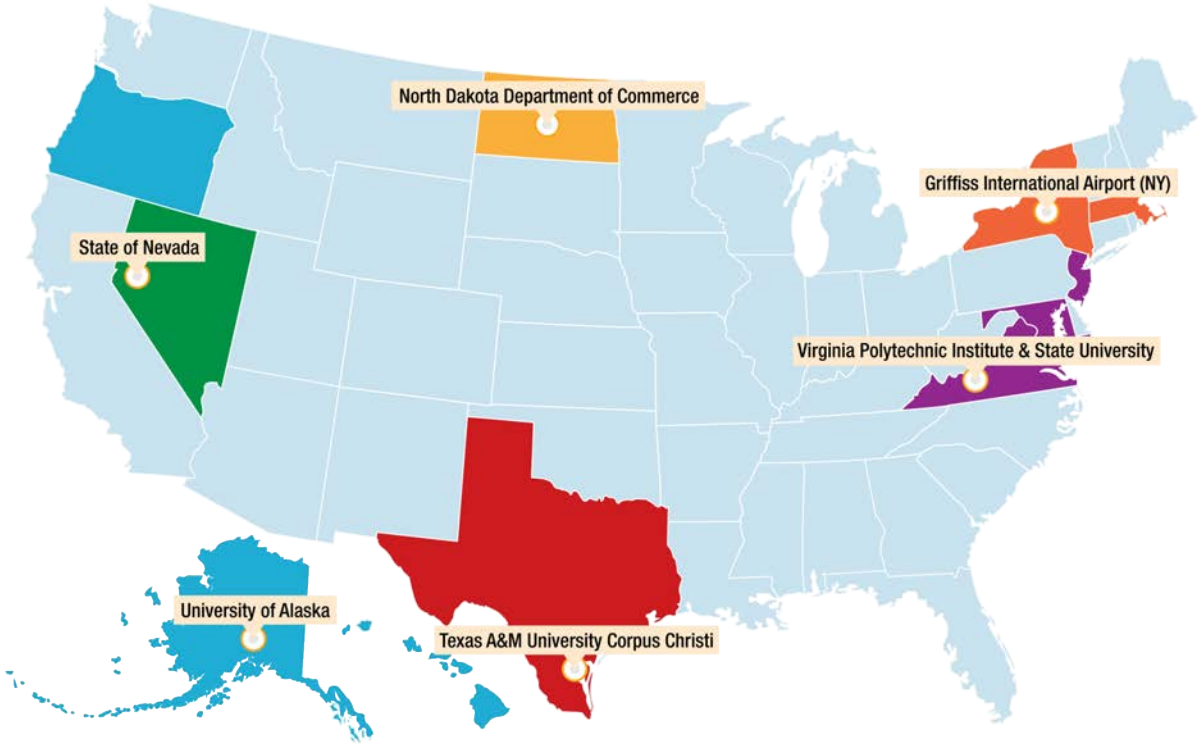


COA Applications Submitted by Proponent CY14

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



http://www.faa.gov/uas/legislative_programs/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

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

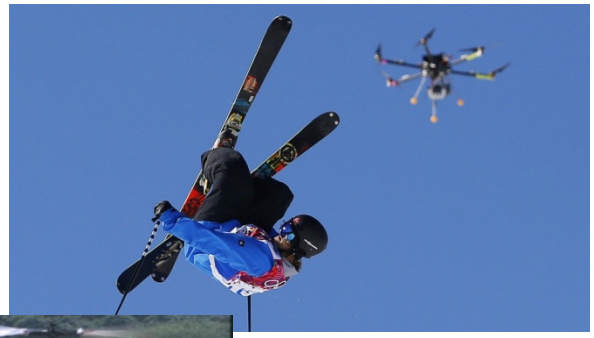
“Know Before You Fly” Outreach Campaign

- **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

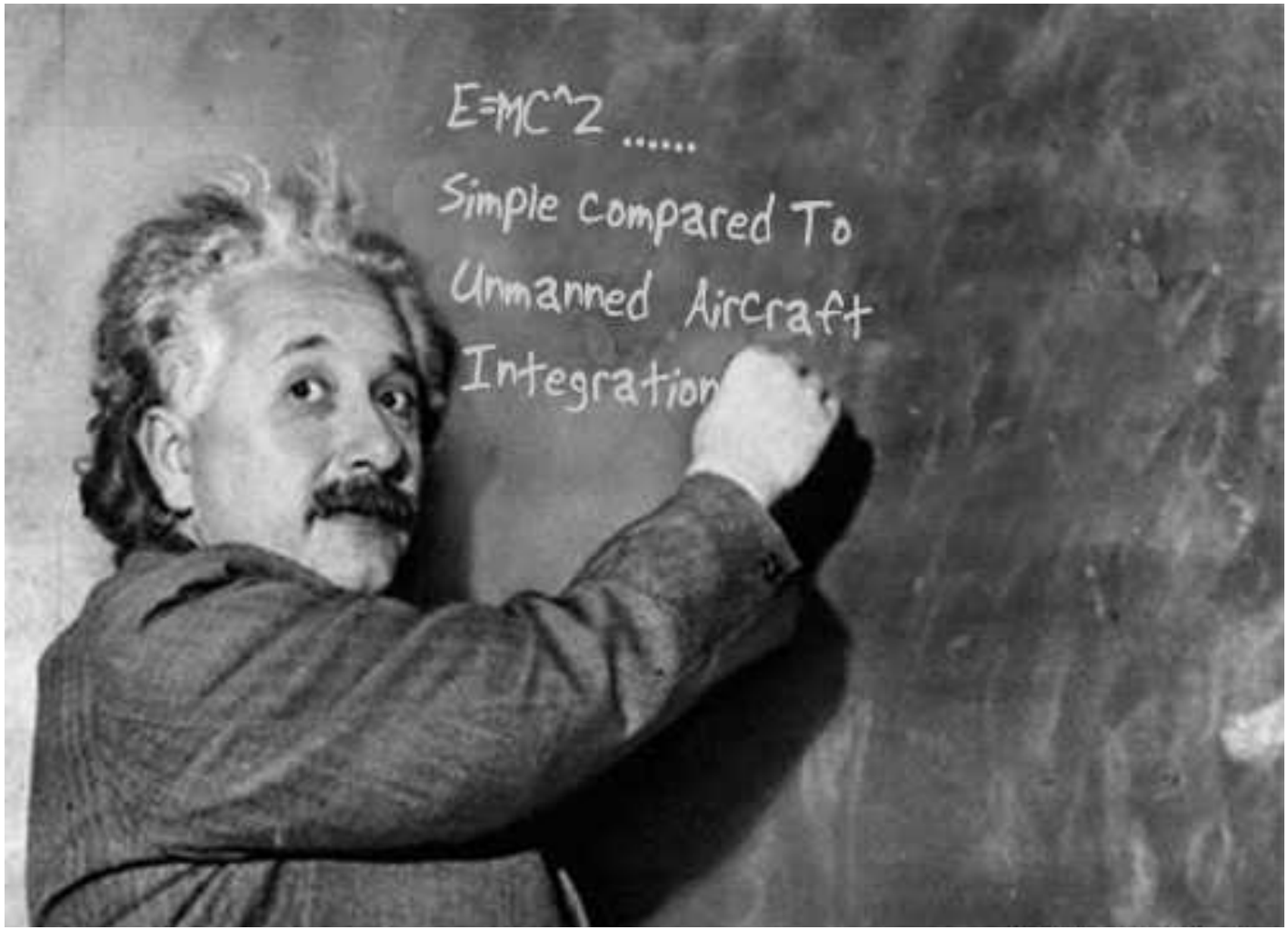
- **Outlines major provisions of proposed Small UAS Rule (Part 107):**
  - Operational Limitations
  - Operator Certification and Responsibilities
  - Aircraft Requirements
  - Model Aircraft
- **Small commercial UAS projected to be largest growth sector**



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

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