Unmanned Aircraft Systems (UAS)

Use & Regulation

Presented to: GUIRR – Nat'l Academy of Sciences

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Date: Wednesday, 24 June 2015

Who & How UAS are Operating in the National Airspace System

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
- Utility Inspection
- Infrastructure Inspection
- Roof Inspection
- Surface Mining
- Others

APPROXIMATELY 1700 OPERATORS AUTHORIZED TO OPERATE IN THE NAS TODAY

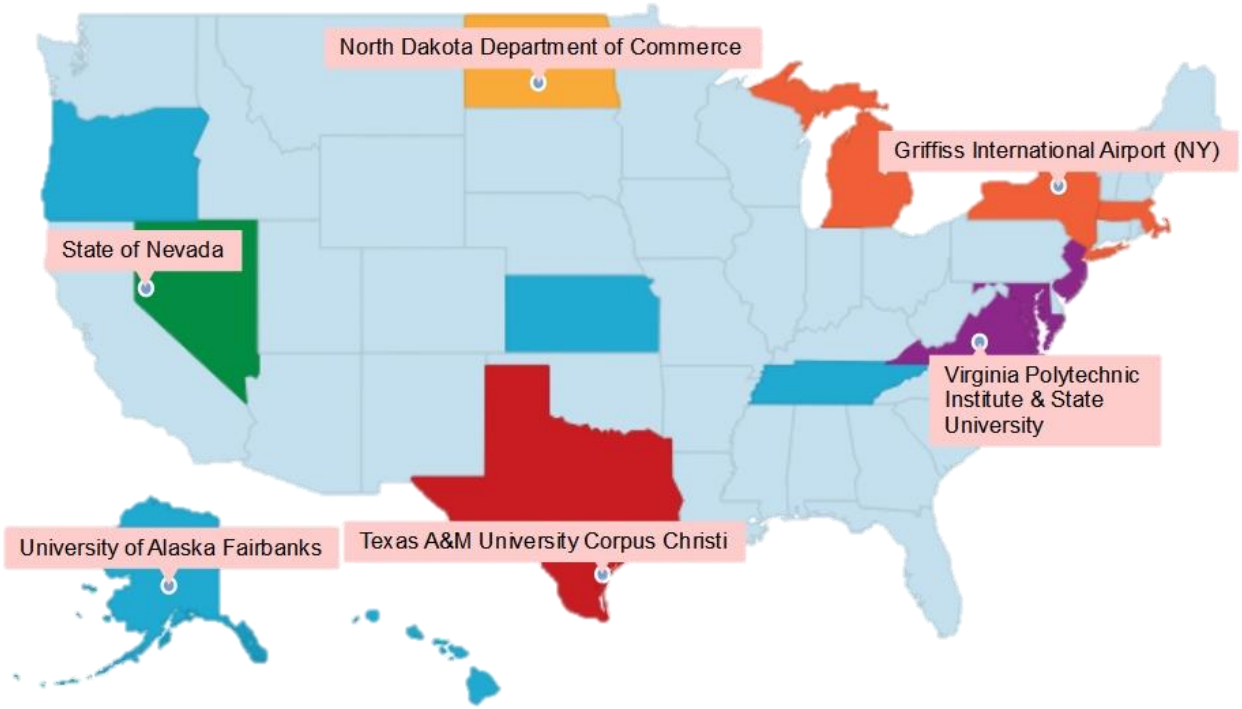
Arctic Small UAS Operations

Per the FMRA, these operations must be

- Permanent
- 24/7
- For research and commercial purposes
- Beyond line-of-sight
- Overwater
- To at least 2,000 feet in altitude
- Ingress and egress from coastal launch sites
- Two restricted category special airworthiness certificates

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

UAS Test Sites



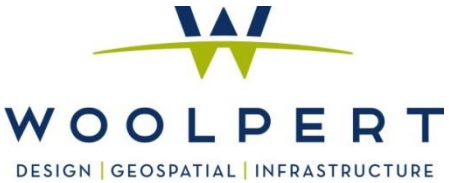
- **University of Alaska**
  - Operational May 5, 2014
- **State of Nevada**
  - Operational June 9, 2014
- **New York Griffiss International Airport**
  - Operational August 7, 2014
- **North Dakota Department of Commerce**
  - Operational April 21, 2014
- **Texas A&M University – Corpus Christi**
  - Operational June 20, 2014
- **Virginia Polytechnic Institute and State University (Virginia Tech)**
  - Operational August 13, 2014

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

Section 333 - Exemptions

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

Section 333 Operators – Partial List



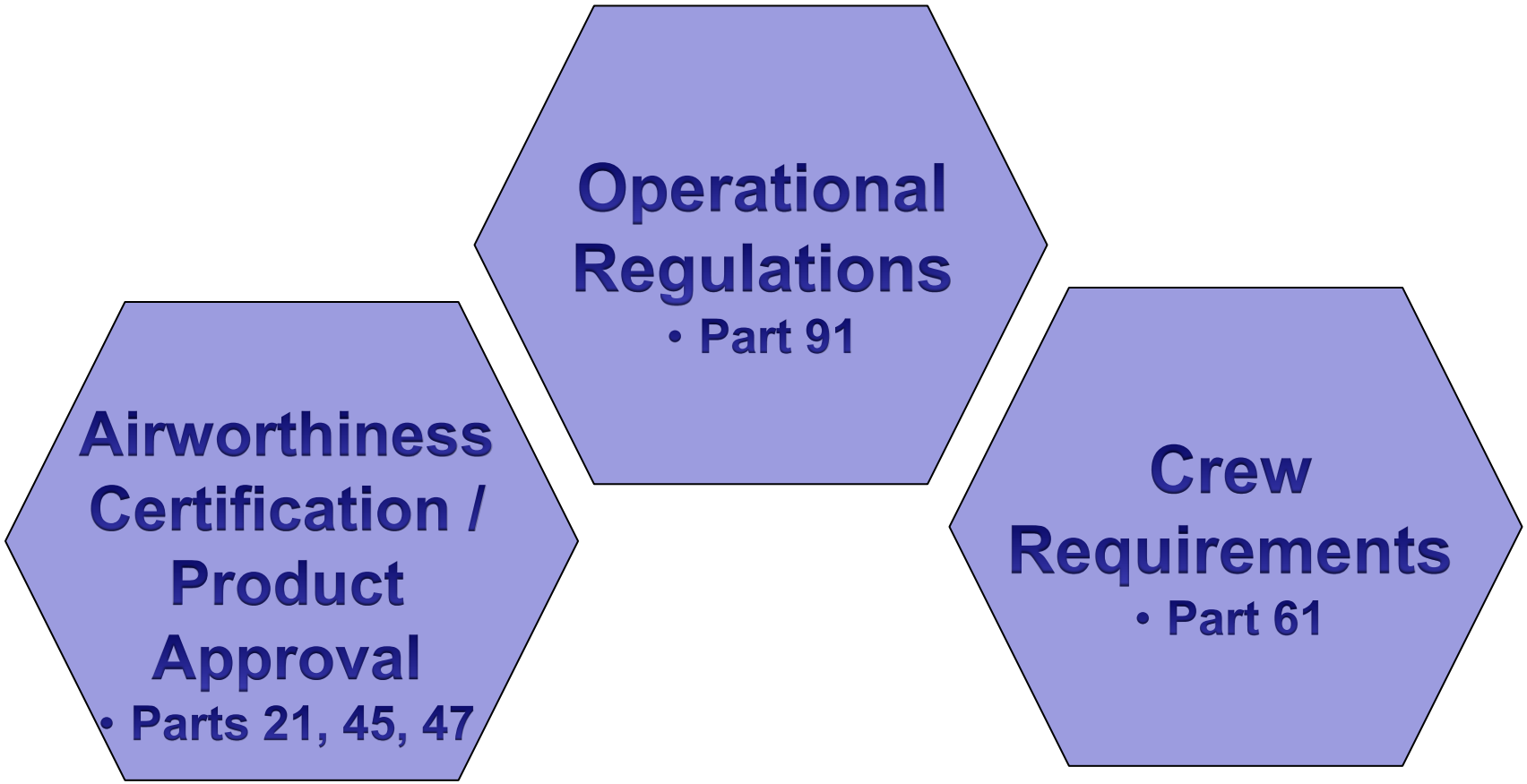
Section 333. Special Rules for Certain Unmanned Aircraft Systems

- **(a) SECTION 333 – Notwithstanding any other requirement of this subtitle, and not later than 180 days after the date of enactment of this Act, *the Secretary of Transportation shall determine if certain unmanned aircraft systems may operate safely in the national airspace system before completion of the plan and rulemaking required by section 332 of this Act or the guidance required by section 334 of this Act*.**

- **(b) ASSESSMENT OF UNMANNED AIRCRAFT SYSTEMS – In making the determination under subsection (a), the Secretary shall determine, at a minimum:**
  - (1) ***which types of unmanned aircraft systems, if any, as a result of their size, weight, speed, operational capability, proximity to airports and populated areas, and operation within visual line of sight do not create a hazard to users of the national airspace system or the public or pose a threat to national security***; and
  - (2) whether a certificate of waiver, certificate of authorization, or airworthiness certification under section 44704 of title 49, United States Code, is required for the operation of unmanned aircraft systems identified under paragraph (1).

- **(c) REQUIREMENTS FOR SAFE OPERATION – If the Secretary determines under this section that certain unmanned aircraft systems may operate safely in the national airspace system, *the Secretary shall establish requirements for the safe operation of such aircraft systems in the national airspace system.***

Section 333 Regulatory Framework



Exemption Status

- More than 1600 companies have filed Petitions for Exemption based on Section 333
- 600+ granted to date
- ~ 90 closed
- 35% complete
- Expected exemption rate: 50+ per week

Exemption Milestones

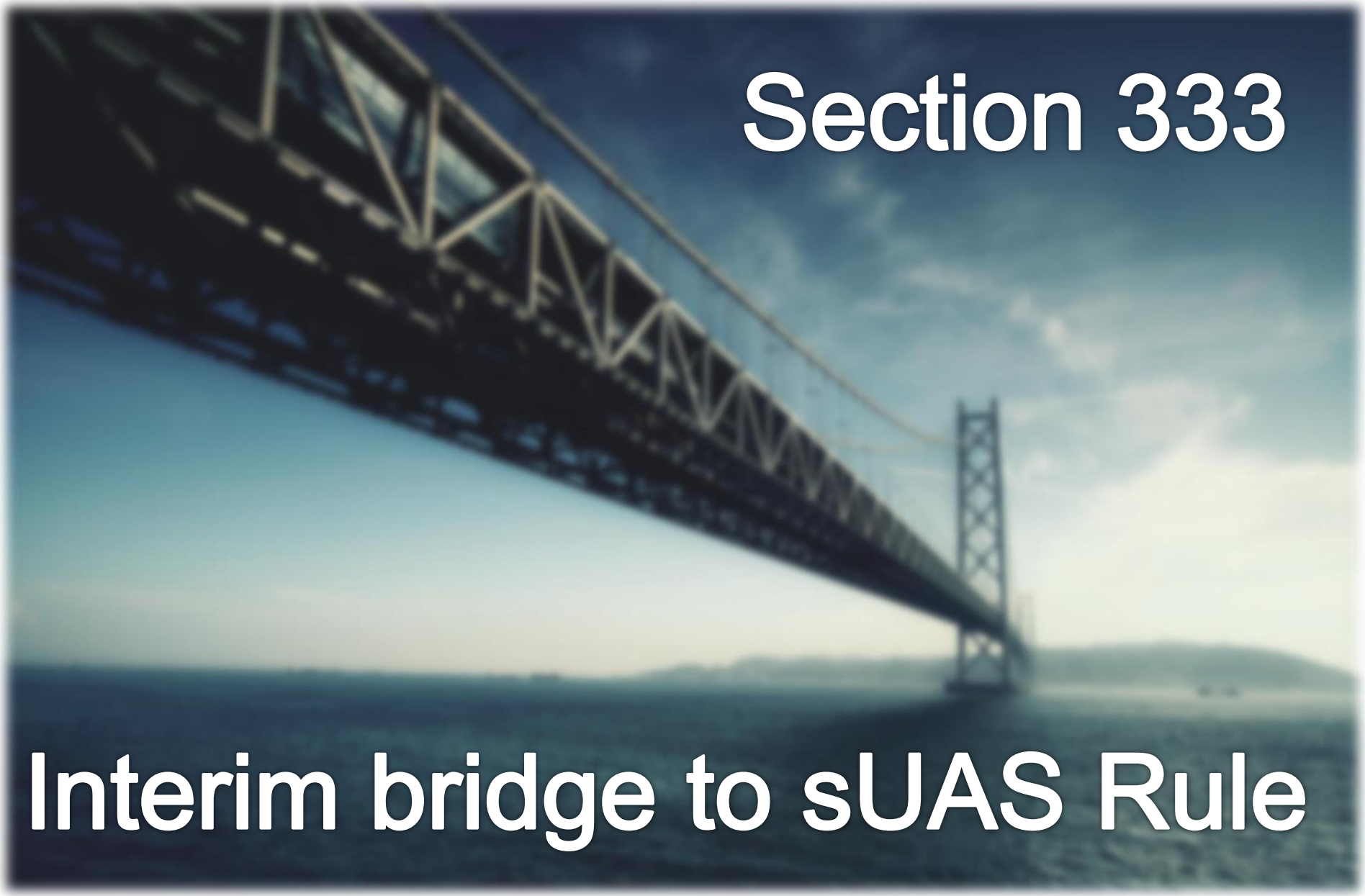
Astraeus Aerial	9/25/2014	First 333 exemption; filmmaking
Trimble	12/10/2014	Precision aerial survey of uncongested areas
VDOS	12/10/2014	Flare stack inspection; offshore operations
Clayco	12/10/2014	Construction management; operations near non-participants
Douglas Trudeau	1/6/2015	Real estate videography
Asymmetric	2/10/2015	Bridge inspection
Commonwealth Edison	2/24/2015	Power line inspection
Aeryon Labs	3/26/2015	Streamlined process; standard conditions and limitations. Sport pilot with U.S. driver's license. Blanket COA.

Exemption Process Improvement

- **Summary grants**
  - Most operations share common attributes
  - 31 standard conditions and limitations
  - No comment period
  - Suitable for majority of petitions
  - Higher processing rate
- **Full grants for petitions not otherwise qualified for summary grant**
  - Aircraft
  - Application – such as agricultural spraying

Exemption Process Improvement

- **Blanket COA**
  - Issued with each new grant of exemption
  - No geographical reference
  - NOTAMs required
  - Maximum altitude of 200 feet AGL
  - Minimum distances from airports:
    - 5 NM if there is an operational control tower
    - 3 NM if airport has published instrument flight procedure, but no operational control tower
    - 2 NM not having published instrument flight procedure or an operational control tower
    - 2 NM from a heliport
  - Monthly activity reporting

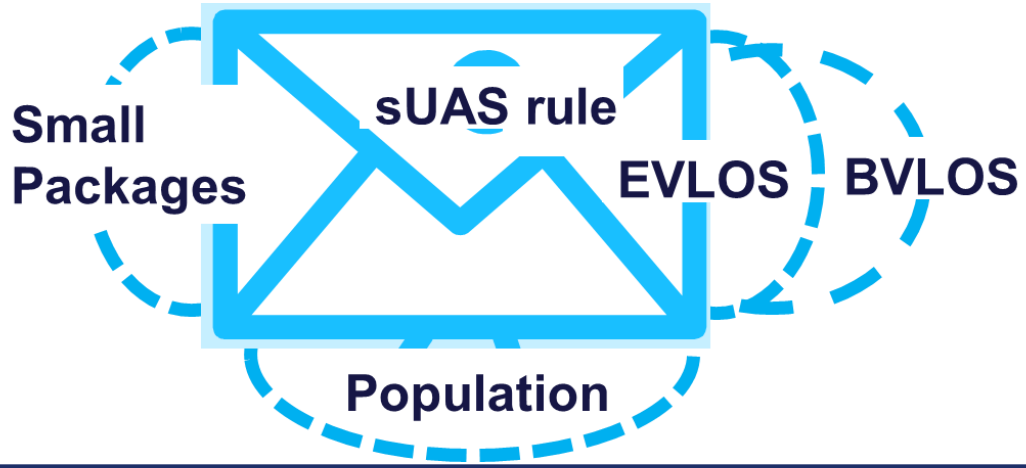

Section 333
Interim bridge to sUAS Rule

Focus Area Pathfinders

- **Program announced in May**
- **Three Focus Area Partners:**
  - CNN
    - UAS in visual line of sight, urban
  - Precision Hawk
    - UAS in extended visual line of sight, rural
  - BNSF Railways
    - UAS beyond visual line of sight, rural

Focus Area Pathfinder Overview

- **Purpose: Identify the safety mitigations that can lead to expanded access for UAS and inform future rulemaking**
- **Approach: Work with industry partners to gain operational approval for key UAS operations and establish a repeatable process**



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

- **Designed to provide model aircraft situational awareness of any restrictions or requirements prior to flight**
- **Limited beta test planned for this summer**

B4UFLY Mobile App Features

- A clear “status” indicator that immediately informs the operator about their current or planned location
- Information on the parameters that drive the status indicator
- A “Planner Mode” for future flights in different locations
- Informative, interactive maps with filtering options
- Contact information for nearby airports
- Links to other FAA UAS resources and regulatory information

UAS Center of Excellence

- **Alliance for System Safety through Research Excellence (ASSURE)**
  - Awarded in May
  - Team led by Mississippi State University
- **Focus: research, education and training in areas critical to safe and successful integration of UAS into the NAS**
- **Initiate research by September 2015. Fully operational by January 2016**
- **Expected to perform any required flight testing at one or more of the six Congressionally-mandated Test Sites**

UAS Center of Excellence

The FAA's UAS Center of Excellence for UAS Research

ASSURE

Alliance for System Safety of UAS through Research Excellence

MISSISSIPPI STATE UNIVERSITY

Core Team

THE UNIVERSITY OF ALABAMA IN HUNTSVILLE

NM STATE UNIVERSITY

OSU Oregon State University

Drexel

UND

UAF UNIVERSITY OF ALASKA FAIRBANKS

EMBRY-RIDDLE Aeronautical University

THE OHIO STATE UNIVERSITY

NC STATE UNIVERSITY

MSU

Indiana State University

KANSAS STATE UNIVERSITY

KU

Associate Members

LOUISIANA TECH UNIVERSITY

TUSKEGEE UNIVERSITY 1881

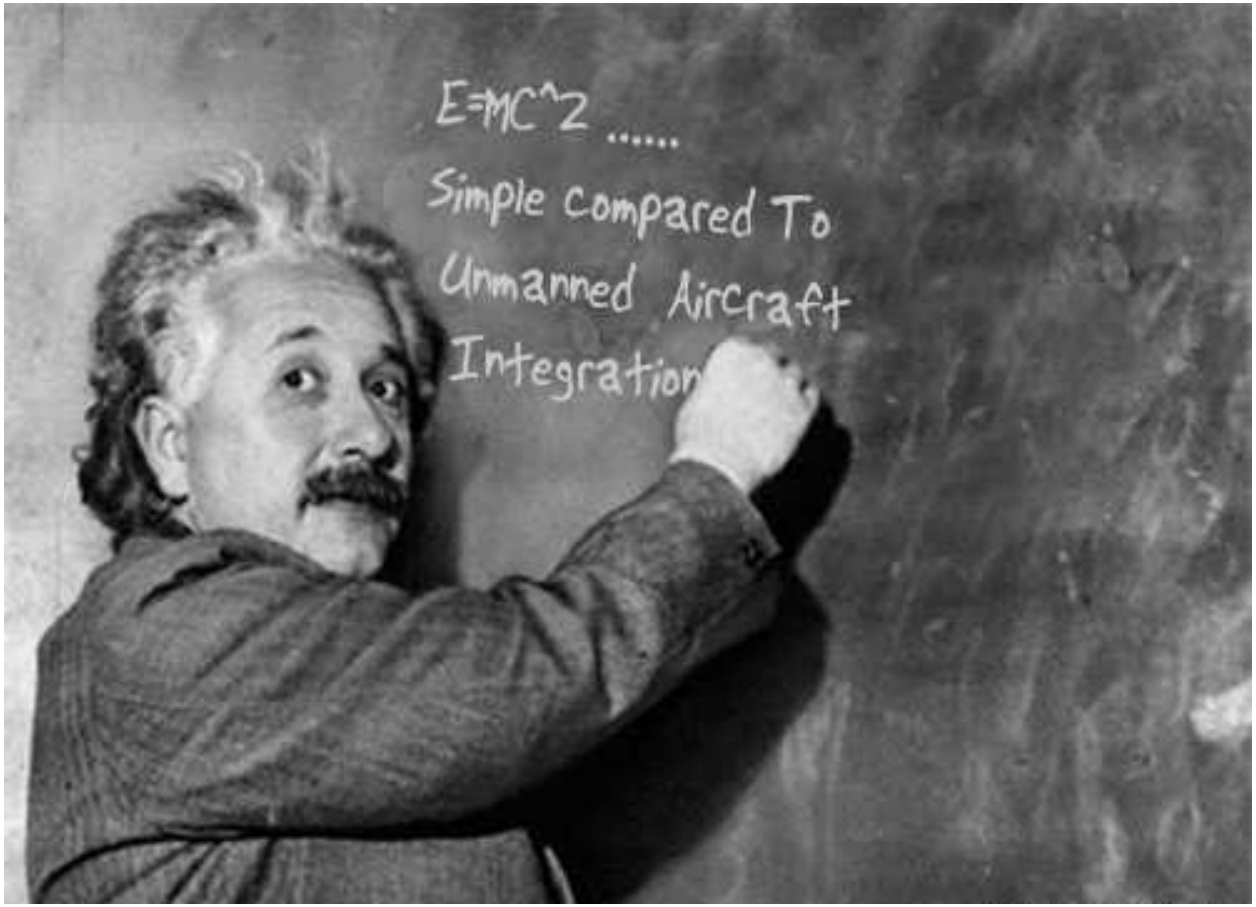
AUBURN UNIVERSITY

Concordia University

University of Southampton

http://www.assureuas.org/

Thank You



www.FAA.gov/UAS