Use of UAS in Research and Education

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An Evolving UAS Environment

- Prior to December 30, 2013 – universities involved in UAS education and research
- December 30, 2013 – 6 FAA Test Sites selected
  - Focused on integration of UAS with the national airspace
- May 9, 2015 – FAA National Center of Excellence announced [ASSURE]
- May 4, 2016 – FAA interpretation memo for educational use of sUAS
- August 29, 2016 – Part 107 Rules for sUAS

The FAA Reform and Reauthorization Act of 2012 contained provisions directing the FAA to take steps toward safely integrating UAS into the NAS by September 2015.

Across the six applicants, the FAA is confident that the agency’s research goals of System Safety & Data Gathering, Aircraft Certification, Command & Control Link Issues, Control Station Layout & Certification, Ground & Airborne Sense & Avoid, and Environmental Impacts will be met.
NP UAS TS COAs

- Large Area COAs
  - Statewide < 1200’
  - Nationwide < 400’

- COAs < 3000’
  - Lakota, ND
  - Carrington, ND
  - GrandSky (Reverse D; GFAFB)

- COAs < 10,000
  - Hillsboro

- COAs < FL290
  - GrandSky (GFAFB)

NUMBER OF FLIGHTS

2014 – 78
2015 – 168
2016 – 1600+
Northern Plains Unmanned Aircraft Systems Test Site

Elbit Hermes 450 UAS Operations

• **Operational Area**
  - 40 miles x 4 miles (COA = 20 miles x 50 miles)

• **Airport Operations**
  - Hillsboro, ND
FAA Part 107 Rules
[Operational Conditions/Restrictions]

- Weight must be less than 55 lbs. [sUAS]
- Operated during daylight hours
  - If UAS has appropriate collision lighting – can be operated into civil twilight hours
- Unaided visual-line-of-sight operations
- Cannot be operated over any person not part of the operation nor under a covered structure
  - However does allow for a payload [UAS + payload must remain below 55 lbs.]
- Must yield right of way to other vehicles
- Must be operated at <400 feet
- Must have groundspeed less than 100 mph
- Must not operate in Class B, C, D, and E airspace without ATC permission
- Must not be operated from a moving vehicle unless operation is in a sparsely populated area
FAA Part 107 Rules
[Pilot/Certification Requirements]

• Operators must obtain certification as a remote pilot
  – Or supervised by a remote pilot

• Pilot requirements
  – Minimum of 16 years old
  – Must pass an aeronautical knowledge test at a FAA-approved knowledge testing center or have a non-student Part 61 pilot certificate [and take a training course]

• Clear the Transportation Security Administration security and threat assessment

• Responsibility of operators
  – Must contact FAA within 10 calendar days of an operation that results in “serious” injury involving hospitalization or loss of consciousness/or property damage >$500.

• Several requirements contained within Part 107 can be waived (e.g. – night operations, altitude restrictions, etc.)
FAA Part 107 Rules
[Actions/Items no Longer Required]

- No “manned” pilots license (instead Part 107 requires a “remote pilot airman certificate with a small UAS rating”)
- No medical certificate (operator must “self-certify” that he/she is capable of operating safely)
- No Notice to Airman
- No insurance requirement
- No airworthiness (operator is responsible for the “airworthiness” of the system
FAA Part 107 Rules
[What is not covered]

- No provisions regarding privacy rights of third parties
  - FAA has stated…”it never extended its administrative reach to regulate the use of cameras or other sensors extraneous to the airworthiness or safe operation of the aircraft in order to protect individual privacy”
What Does this Mean for Universities?

[Legal and Ethical Questions]

- **First Amendment**
  - Evolving issues such as “right to record”
  - Journalists using UAS
- **Fourth Amendment**
  - University law enforcement use of UAS (security, law enforcement, etc.)
  - Interplay between First and Fourth Amendment (i.e. – the courts have held that law enforcement does not have to shield their eyes when in public places
- **Property rights**
  - Ambiguity involving “aerial trespass” and property rights at lowest altitudes of airspace
  - Restricting UAS operation by restricting where operator “stands” or where take-off and landing occurs
- **Privacy / Nuisance / harassment / surveillance**
  - Addressing surveillance of human subjects in research
- **Liability for “out-of-state” operations**
What Does this Mean for Universities?

[Policies]

Policy Statement [pending Faculty Senate approval]

The operation of Unmanned Aircraft Systems (UAS) is regulated by the Federal Aviation Administration (FAA) and relevant state law. The term UAS includes all types of unmanned aircraft including what are commonly called drones and model aircraft. North Dakota State University employees and students must comply with FAA requirements, state law, and any other locally applicable laws or regulations for flight operations of unmanned aircraft systems over NDSU property or for any university related activity.

NDSU will establish procedures to ensure compliance with these legal obligations and to reduce the risks of UAS flight operations to safety, security and privacy. The procedures can be obtained from the NDSU UAS web page.

As part of its commitment to growing the use of UAS for research and education, and its commitment to ensuring that such use is being conducted according to the regulations, NDSU has established a UAS Advisory Panel. The UAS Advisory Panel provides oversight for the establishment and maintenance of the UAS procedures. They also review the proposed use of UAS for research and education purposes to consider any privacy or ethics related concerns.
What Does this Mean for Universities? [Procedures]

Applies to:
- NDSU employees and students as part of university employment and/or university activities
- Operation by any person [including model aircraft] on or above NDSU property
- Hiring for or contracting for any UAS services by a NDSU unit

### Research
- Under 14CFR Part 107 (Small UAS Rule)

### Educational Use
- Student flight operations for educational (not research) purposes.
- Utilize model aircraft rules
- Refer to FAA Memorandum dated May 4, 2016

### Subcontract to External UAS Operator
- Subcontractor Responsible for Following Regulations
- Subcontract or Service Level Agreement

### Model Aircraft Operation Over University Property
- Must Follow Model Aircraft Rules (Air Traffic Control approval to fly within 5 mi of Hector airport)

### 3rd Party Flight Operations Over University Property
- Must Follow FAA Regulations (Air Traffic Control approval to fly within 5 mi of Hector airport)

### Indoor Flight Operations On University Property
- Procedure (To be written)
- Approval from NDSU Office of Public Health and Safety
What Does this Mean for Universities?

[Procedures - Research]

NORTH DAKOTA STATE UNIVERSITY

Procedure for Unmanned Aircraft Flight Operations under the FAA Small UAS Rule

9/29/2016
Version 1.0

NORTH DAKOTA STATE UNIVERSITY

Procedure for Unmanned Aircraft Flight Operations under FAA COAs

9/29/2016
Version 3.0

Via the Test Site
# What Does this Mean for Universities?

## [Procedure – Research – sUAS Rule]

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What Does this Mean for Universities?

[Procedure – Education]

Memorandum

Date: May 4, 2016

Federal Aviation Administration

Can fly under section 336 or Part 107

Faculty teaching aviation-related courses at accredited educational institutions may assist students who are operating a model aircraft under section 336 and in connection with a course that requires such operations, provided the student maintains operational control of the model aircraft such that the faculty member’s manipulation of the model aircraft’s controls is incidental and secondary to the student’s (e.g., the faculty member steps-in to regain control in the event the student begins to lose control, to terminate the flight, etc.).

educational institutions and community-sponsored events; and (2) student use of unmanned aircraft in furtherance of receiving instruction at accredited educational institutions.

There is uncertainty in the model aircraft community about when an unmanned aircraft is a model aircraft operated for hobby or recreation or is an operation requiring FAA authorization. The FAA has received many inquiries from students and educational institutions offering coursework in the design, construction and operation of small unmanned aircraft with respect to the types of activities in which students and faculty lawfully may engage pursuant to the existing legal framework.
THANK YOU