North Dakota State University
Unmanned Aircraft System Procedure

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1. Scope

This document describes the procedure for NDSU faculty, staff, and students to use small unmanned aircraft systems for university purposes under the Title 14 Code of Federal Regulations (14 CFR) Part 107 Small Unmanned Aircraft System.

2. Procedure for Small UAS Flight Operations Under FAA Part 107

The set of requirements that must be followed are described in 14 CFR Part 107. In addition, an Advisory Circular AC 107-2 was issued by the FAA to provide guidance information for compliance with Part 107. An abbreviated list of some of the requirements includes the following:

- Unmanned aircraft must weigh less than 55 lbs. (25 kg)
- The aircraft must be operated within visual line-of-sight (VLOS) only.
- May not operate over any persons not directly participating in the flight operation.
- Daylight-only operations.
- Maximum altitude of 400 feet above ground level or within 400 feet of a structure.
- Minimum weather visibility of 3 miles from the ground control station.
- A person operating a small UAS must either hold a remote pilot airman certificate with a small UAS rating or be under the direct supervision of a person who holds a remote pilot certificate (remote pilot in command).
- The remote pilot in command must conduct a preflight inspection.
- A person may not act as a remote pilot in command for more than one unmanned aircraft at one time.

2.1 Project Coordination and Support

The Part 107 small UAS rule greatly simplifies the process for operating small UAS under many conditions, however, there are numerous FAA requirements that must be complied with to operate legally under the rule. Project personnel must be cognizant of these requirements and must comply with all rules. A point of contact at NDSU for assistance with the process is:

NDSU UAS Coordinator
Aaron Reinholz, NDSU Office of Research and Creative Activity
Research 2 Office 102E; aaron.reinholz@ndsu.edu Ph. (701) 231-5338

2.2 Aircraft Insurance

Small unmanned aircraft flight operations that are being conducted by NDSU employees under the requirements of the small UAS rule (14 CFR Part 107) are covered under the North Dakota Risk Management Fund for liability. A separate commercial insurance policy is not required.

With respect to damage to the aircraft from either flight activities or non-flight events, neither the Risk Management Fund nor the State Fire and Tornado fund will cover such damage to an unmanned

aircraft. Coverage for damage to the aircraft or any attached payloads would need to be procured separately by the researcher if desired.

2.3 Aircraft Registration

The FAA requires that each aircraft be registered and that the registration number be marked on the aircraft. The FAA has implemented a greatly simplified process to register unmanned aircraft online. This process takes only a few minutes and a registration number will be provided immediately. The make, model, and serial number information are all that is needed to complete this process. After the registration number is obtained, the aircraft must be marked. Figure 1 describes the FAA's instructions for marking the unmanned aircraft. The registration information must be provided to the NDSU UAS Coordinator.

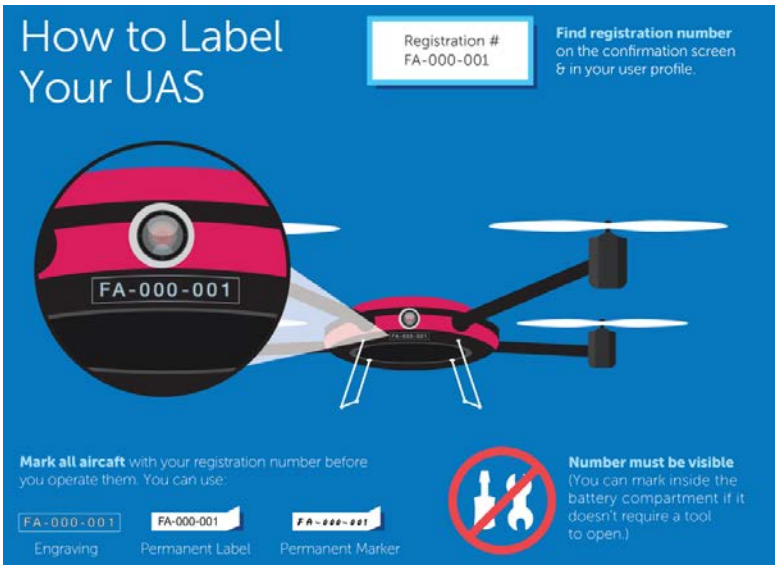


Figure 1: Marking Instructions for Registration Number

2.4 Flight Crew Requirements and Qualifications

A remote Pilot in Command (PIC) must possess an FAA issued remote pilot certificate for flight operations under the Part 107 UAS rule. Typically, the PIC would be the person operating the aircraft, but the Part 107 rule does allow for operations by someone who would be under the direct supervision of a person that holds a remote pilot certificate. "Direct Supervision" requires that the PIC is able to immediately take direct control of the sUAS to quickly address a hazardous situation. This would generally require the PIC to be in close proximity to the person operating the aircraft.

A mission commander is not required.

A Visual Observer may be used, but is not required.

A medical certificate is not required for a remote pilot certificate. A person may not, however, participate in the operation of an sUAS if they know or have reason to know that they have a physical or mental condition that could interfere with the safe operation of the sUAS.

An FAA issued remote pilot certificate can be obtained in one of two ways.

1) Take the aeronautical knowledge test
    - Acquire the necessary knowledge to pass the test either by self-study or by taking a course (in-person or online) to prepare.
    - Take the test at an official FAA testing center. In Fargo, tests are given at the Fargo Jet Center. There is a $150 fee for taking the test.
    - If the test is successfully passed, complete an application for a remote pilot certificate (FAA Form 8710-13). The online process (https://iacra.faa.gov/iacra) is highly recommended (see appendix B for details), however, a paper application process is also available.
    - After the online application is submitted there is a Transportation Security Administration (TSA) vetting process to complete a background security check of the applicant. Once the TSA vetting process is completed, the applicant will receive an e-mail notifying them that a temporary certificate can be printed. This is valid for up to 120 calendar days.
    - After other FAA processing is complete, a permanent certificate will be issued to the applicant.
    - The aeronautical knowledge test must be completed once every 24 calendar-months for the certificate to continue being valid.
    - If a person fails the aeronautical knowledge test, they must wait at least 14 calendar days before applying to retake the test.

2) If a person holds a part 61 pilot certificate (a student pilot certificate does not qualify), and has completed a flight review within the previous 24 calendar-months they may use the following process in-lieu of taking the aeronautical knowledge test:
    - Complete the online course (Part 107 small UAS) located within the FAA Safety Team web site (www.faasafety.gov) and receive a completion certificate.
    - Complete an application for a remote pilot certificate (FAA Form 8710-13). The online process is highly recommended https://iacra.faa.gov/iacra/ (see appendix B for details), however, a paper application process is available.
    - Contact a FSDO (Flight Standards District Office) to make an appointment to validate the applicant's identification. The applicant must present the completed 8710-13 form, the online course completion certificate, and proof of a current flight review.
        - Fargo FSDO Location: 4620 Amber Valley Parkway Fargo, North Dakota. Phone: (701) 492-5800.
    - After verifying the application, the FSDO representative will issue a temporary remote pilot certificate.
    - After other FAA processing is complete, a permanent remote pilot certificate will be issued to the applicant.
    - There is a $50 fee for the application process.

Note: As an alternative to contacting the FSDO, a Designated Pilot Examiner (DPE), an Airman Certification Representative (ACR), or a Certified Flight Instructor (CFI) may also validate the applicant's identification, however a CFI will not be able to issue a temporary remote pilot certificate.

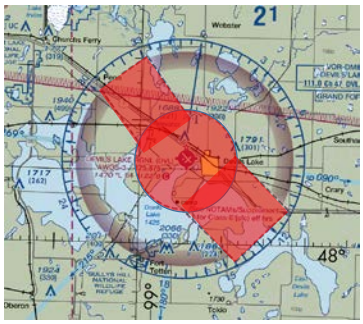
In addition to holding a Remote Pilot Certificate, the Pilot in Command must attain proficiency in actual operation of the specific aircraft that will be flown. This can be accomplished in one of several ways.

- For PICs that have already been flying aircraft under the NP UAS Test Site COAs they will have been trained already in specific aircraft that are being flown under current NDSU research projects.
- Obtain training from the aircraft manufacturer, aircraft distributor, or other 3rd party if available. This is highly recommended for any aircraft, but in particular for fixed wing aircraft.
- Obtain training under the guidance and supervision of a PIC that is already proficient in that aircraft type or a similar aircraft. This could be another NDSU researcher.

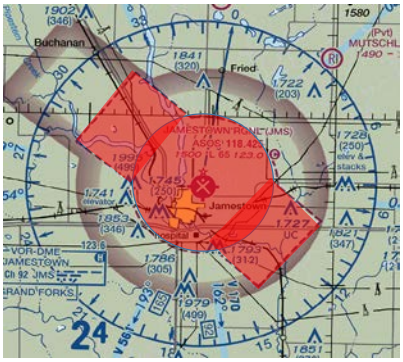
2.5 Operational Areas

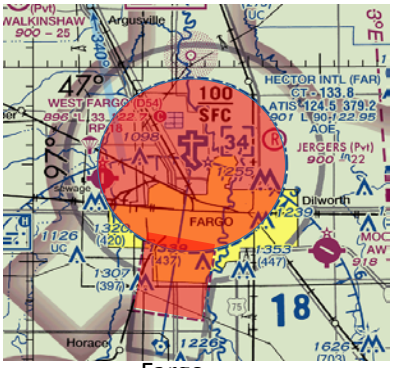
Flight operations are allowed within Class G airspace without permission from Air Traffic Control. Most of the airspace throughout North Dakota and neighboring states under 400' AGL is Class G with the exception of some airport areas. The following areas in North Dakota have Class D and/or E airspace: Fargo, Jamestown, Bismarck, Dickinson, Williston, Minot, Minot AFB, Devils Lake, Grand Forks AFB, and Grand Forks. Figure 2 highlights in red shading those particular areas.

Operations within Class B, C, D and E airspace may be allowed if permission is received from Air Traffic Control. Note that the entirety of the NDSU main campus in Fargo lies within Class D Airspace, thus approval from the FAA will need to be obtained for any flights. If operations in these areas are desired, contact the NDSU UAS Coordinator to pursue discussion with the appropriate FAA personnel. An online airspace authorization or waiver will need to be submitted. Approvals generally take 1 – 3 months.

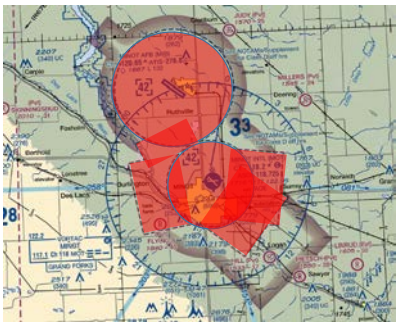

Devils Lake

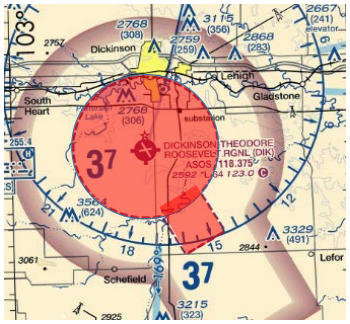

Grand Forks


Jamestown


Fargo


Williston


Minot


Dickinson


Bismarck

Figure 2: UAS Flight Limitations in North Dakota Locations.

2.6 Flight Plan Review

A Flight Plan form will be filled out for each project that will utilize UAS and is to be submitted to the NDSU UAS Coordinator. The form will be reviewed to ensure the necessary information has been supplied and that the proposed flights meet the criteria for the small UAS rule. The form should be updated and resubmitted if there are substantial changes during the project. Examples would include a different pilot, different aircraft, or different locations for the flights.

A review committee will consider the privacy/ethics aspects of the proposed flight operations.

- If the proposed flights are routine and follow a standard, already accepted protocol, the committee may approve by electronic consensus. An example of this might be agriculture flights or other similar applications that would be in rural, sparsely populated areas away from towered airports over land that is owned either by NDSU or by collaborating landowners/farmers.
- If proposed flights are more complex in some way or generate any questions or concerns, an in-person review by the committee with the project PI may be scheduled. An example of this might be a flight to be conducted over an urban area, near a towered airport, etc.

The review committee will consist of the NDSU UAS Advisory Panel and additional at-large members as deemed necessary.

The Flight Plan form is available on the UAS web page.

2.7 Pre-Flight Check

Prior to every flight, the remote Pilot in Command is responsible for conducting a check of the sUAS and verifying that it is in a condition for safe operation. A preflight checklist for each specific aircraft type should be developed if not already provided by the manufacturer. Guidance for the preflight check is found in AC 107-2 section 7.3.4.

2.8 Accident Reporting

The remote PIC of the sUAS is required to report an accident to the FAA within 10 days if it meets any of the following thresholds:

- Serious injury to any person or any loss of consciousness. A serious injury is an injury that qualifies as Level 3 or higher on the Abbreviated Injury Scale.
- Damage to any property, other than the small-unmanned aircraft, if the cost is greater than $500 to repair or replace the property (whichever is lower).

The report is submitted to the FAA Regional Operations Center either electronically (www.faa.gov/uas/) or by phone (817-222-5006).

An incident report must be submitted to the NDSU Safety Office within 24 hours and is to be provided to the NDSU UAS Coordinator.

Incident Report for Employees
Incident Report – Non-Employee

2.9 Data Collection and Management

Careful consideration needs to be given for any data that will be collected during UAS flights, particularly aerial image sensor data. A few questions to consider are as follows:

- What areas will be imaged? Is it NDSU property? Other public property? Private property?
- During the flights, is it possible you would be imaging over adjacent land that is not part of the project? If so, might that imagery be sensitive and if so how will that be handled?
- Where will you store the data? How much storage capacity will be needed?
- Who will have access to the data? Does it need to be secured?
- How long will the data need to be stored before being destroyed?

Answers to these types of questions should be determined as the project is being planned. PIs should also be aware that data collected for projects could be subject to open record requests under ND open record laws. If such a request were made it would be reviewed by legal counsel from the ND Attorney General's office to determine what data must be released in response to the request. This information should be conveyed by PIs to any collaborators on their projects.

REVISION HISTORY

V1.0 Initial Release
V2.0 10/03/2017. Updated document format. Updated data collection section 2.9. Added links to UAS web page and incident report forms.