IOWA

IIHR—Hydroscience and Engineering

Small Unmanned Aircraft System Safety Guidelines

The contents of this document pertain to work by IIHR personnel and the safe use of small unmanned aircraft systems (sUAS) for research activities. Research conducted by hydrologists, geologists, engineers, biologists, and other scientists may involve the use of sUAS. In particular, scientists from the University of Iowa's IIHR—Hydroscience and Engineering use sUAS to collect visual data for research purposes and to monitor research sites. Performing work functions from an aerial platform can present unusual problems compared to other work environments. The safety of all personnel working with and around sUAS is of primary importance.

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BACKGROUND AND PURPOSE

The authors of this document gathered information from several sources. Among these are publications by the Federal Aviation Administration (FAA), the KnowBeforeYouFly organization, the Academy of Model Aeronautics, and policies developed by Indiana University and the University of Idaho. This document is compiled for IIHR personnel and is not meant to be comprehensive, but rather a concise primer highlighting key and critical information for those who work with small unmanned aircraft systems (sUAS), either on a routine or occasional basis. Rules established by the FAA and the University of Iowa are the final determination if questions arise.

Small unmanned aircraft systems come in a variety of shapes and sizes and serve diverse purposes. They are defined as weighing less than 20 pounds, and most are less than 10 pounds. Regardless of size, the responsibility to fly safely applies equally to manned and unmanned aircraft operation.

Small unmanned aircraft systems, or drones as they are often called, are increasingly available online and on store shelves. Prospective operators want to fly and fly safely, but many don't realize that just because you can easily acquire an sUAS doesn't mean you can fly it anywhere or for any purpose.

The purpose of this document is to identify and specify minimum requirements for the safe operation of IIHR sUAS; these requirements are often unique to scientific research. In addition, this document provides requirements for the training and certification of sUAS operators for IIHR.

QUICK SUMMARY – CURRENT FAA OPERATIONAL RULES

- Don't fly above 400 feet above ground level (AGL). Fly no higher than necessary and less than 400 feet. Remain below surrounding obstacles when possible.
- Avoid operations close to airports. When within five miles of an airport, contact the airport and/or air traffic control (ATC).
- Keep your craft within line of sight. Use a spotter when necessary and appropriate.
- Don't fly in **NOAA regulated overflight zones** and obey all Temporary Flight Restrictions/Flight Restricted Zones (TFRs/FRZs).
- Fly safely and do not fly near pedestrians, wildlife, buildings, and property, etc. Use your common sense.
- Don't take off and or land inside a national park. You can be cited by a park ranger and face a possible $5,000 fine and six months of jail time.
- Don't operate on or fly over private property without first obtaining permission from the property owner and/or the property tenant.
- Don't fly where the operation of radio-controlled aircraft is prohibited.
- Don't fly near open assemblies of people without first obtaining permission or otherwise making prior arrangements to do so.

- Don't fly near or over sensitive infrastructure or property such as power stations, water treatment facilities, correctional facilities, heavily traveled roadways, government facilities, etc., without making prior arrangements to do so.
- Do not interfere with manned aircraft operations.
- Yield the right of way to manned aircraft. Be alert for and avoid other aircraft at all times (AMA Doc #540-D).
- Do not endanger persons or property. Do not intentionally fly over moving vehicles or unprotected persons. Fly no closer than 25 feet.
- Ensure pilot competency and proficiency and the safe operation of the aircraft.

QUICK SUMMARY – 2015 PROPOSED FAA OPERATIONAL RULES

- Drones must weigh less than 55 pounds.
- Flights must take place during daylight hours only.
- Flights must take place within visual line of sight of the operator.
- Operators may work with a visual observer, but the operator still must be able to maintain visual line of sight.
- The drone must be registered, and aircraft markings are required.
- Operators must be 17 years old, pass an aeronautical knowledge test, hold an FAA Unmanned Aircraft System (UAS) operator certificate, and pass a Transportation Security Administration (TSA) background check.
- Aeronautical knowledge testing must be renewed every 24 months (no private pilot license or medical rating required).
- Operators must ensure their aircraft is safe for flight, but there are no burdensome airworthiness standards or certification requirements. A preflight inspection conducted by the operator, checking communications links and equipment, is sufficient.
- Operators must report an accident to the FAA within 10 days of any operation that results in injury or property damage.
- No operations are allowed in Class A airspace (18,000 feet and above). Operations in Class B, C, D, and E airspace are allowed with the required air traffic control (ATC) permission. Operations in Class G airspace are allowed without ATC permission.
- The rules do not apply to model aircraft if those operators continue to satisfy all of the criteria specified in Section 336 of Public Law 112-95, including the stipulation that they are operated only for hobby or recreational purposes.
- These rules maintain the existing prohibition against operating in a careless or reckless manner. They also bar an operator from allowing any object to be dropped from a UAS.
- The operator must always see and avoid manned aircraft. If there is a risk of collision, the drone operator must be the first to maneuver away.

- The operator must discontinue the flight when continuing would pose a hazard to other aircraft, people, or property.
- The operator must assess weather conditions, airspace restrictions, and the location of people to lessen risks if he or she loses control of the UAS.
- The drone may not fly over people, except those directly involved with the flight.
- The drone must operate below 500 feet in altitude and no faster than 100 miles per hour.
- Drones must stay out of airport flight paths and restricted airspace areas and obey any FAA Temporary Flight Restrictions (TFRs).

PRIVACY

The use of imaging technology for aerial surveillance with radio control model aircraft with the capability of obtaining high-resolution photographs or video, or the use of any type of sensor, for the collection, retention, or dissemination of surveillance data or information on individuals, homes, businesses, or property at locations where there is a reasonable expectation of privacy is strictly prohibited unless express written permission is obtained beforehand from the individual property owners or managers.

PUBLIC ENTITIES (UNIVERSITY) SUAS USE

Public entities, which include publicly funded universities, law enforcement, fire departments, and other government agencies, may currently apply for a certificate of authorization (COA) from the FAA in order to use small UAS in public aircraft operations.

Who can obtain a COA to operate public aircraft?

- Only government entities, such as federal and state government agencies, law enforcement agencies, and public colleges and universities can receive a COA for public UAS aircraft operations.
- Public aircraft operations must be conducted for a governmental function.
- COAs are most commonly issued to public (government) entities but are also required for civil (private) operations.
- The FAA thoroughly evaluates each COA application to determine the safety of the proposal.
- COAs are issued for a specific period of time, usually two years, and include special provisions unique to each proposal, such as a defined block of airspace and time of day when small UAS can be used.

How can I apply for a COA?

- Visit the FAA website for information on how to apply for a COA online.

- Since 2009, the FAA has taken steps to streamline the application process by transitioning online.
- The average authorization period is less than 60 days.
- Expedited authorization is available in emergency and life-threatening situations.

IIHR–HYDROSCIENCE AND ENGINEERING SUAS POLICY – TENTATIVE

Scope

This policy applies to:

- IIHR employees and students operating unmanned aircraft systems in any location as part of their university employment or activities;
- The operation of an unmanned aircraft system or model aircraft by any person on or above University of Iowa property; and
- The purchase of unmanned aircraft systems with funding from the University of Iowa, including university accounts, grants, or UI Foundation accounts.

Policy Statement

The Federal Aviation Administration (FAA) and relevant state laws regulate the operation of unmanned aircraft systems. The University of Iowa will establish procedures required to ensure compliance with those legal obligations and to reduce risks to safety, security, and privacy.

Reason for Policy

The university must comply with FAA requirements, state law, and any other locally applicable laws or regulations regarding unmanned aircraft systems. Inherent risks in the operation of such equipment require additional insurance provisions and policy considerations.

Procedures

- All members of the university community are personally responsible for complying with FAA regulations, state and federal laws, and university policies.
- Any IIHR employee or student wishing to operate a small unmanned aircraft system (sUAS) as part of their university employment or as part of a university program must first obtain a 333 exemption, Certificate of Waiver, or Certificate of Authorization (COA) issued by the FAA. The Research Computing Services (RCS) area is the FAA account holder for IIHR COAs and must process all applications on a case-by-case basis.
- Any university employee, student, or unit purchasing an sUAS (or the parts to assemble an sUAS) with university funds, funds disbursed through a university account, or grant funds, must contact RCS to assess

the university's ability to obtain a COA, other necessary FAA exemptions, or meet local compliance requirements.

- Any third party or hobbyist wishing to use a sUAS or model aircraft over university property must first receive approval through RCS. Third parties planning to use UAS must also provide proof of FAA approval. In addition, operation of an sUAS by a third party or hobbyist over university property must be under a contract that holds the university harmless from any resulting claims, harm to individuals, and damage to university property and provides insurance as required by the university.
- When operating a sUAS to record or transmit visual images, operators must take all reasonable measures to avoid violations of areas normally considered private. Iowa state law provides that a person who knowingly or intentionally places a camera or electronic surveillance equipment that records images or data of any kind while unattended on the private property of another person without the consent of the owner or tenant of the private property commits a Class A misdemeanor.
- Use of sUAS must comply with any other applicable university policies.

Appropriate and Prohibited Uses

- Small unmanned aircraft systems shall not be used to monitor or record areas where there is a reasonable expectation of privacy in accordance with accepted social norms. These areas include but are not limited to restrooms, locker rooms, individual residential rooms, changing or dressing rooms, and health treatment rooms.
- Small unmanned aircraft systems shall not be used to monitor or record residential hallways, residential lounges, or the insides of campus daycare facilities.
- Small unmanned aircraft systems shall not be used to monitor or record sensitive institutional or personal information that may be found, for example, on an individual's workspace and on computer or other electronic displays.

Definitions

University of Iowa Property — Buildings, grounds, and land owned by the University of Iowa or controlled by the University of Iowa via leases or other formal contractual arrangements to house ongoing university operations.

COA — Certificate of Authorization (COA) or waiver. According to the FAA, the COA is an authorization issued by the Air Traffic Organization to a public operator for a specific UA activity. After a complete application is submitted, FAA conducts a comprehensive operational and technical review. If necessary, provisions or limitations may be imposed as part of the approval to ensure the UA can operate safely with other airspace users. In most cases, FAA will provide a formal response within 60 days from the time a completed application is submitted.

333 Exemption — FAA exemption based on Section 333 of the FAA Modernization and Reform Act of 2012 (FMRA) grants the secretary of transportation the authority to determine whether an airworthiness certificate is required for a UAS to operate safely in the National Airspace System.

Unmanned Aircraft Systems (UAS) — UAS are also known as or may be characterized as drones. According to the FAA, a UAS is an unmanned aircraft and all the associated support equipment, control station, data links, telemetry, communications and navigation equipment, etc., necessary to operate the unmanned aircraft. UAS may have a variety of names including quadcopter, quadrotor, etc. FAA regulation applies to UAS regardless of size or weight. Model aircraft are not considered by the FAA as UAS and have different regulations.

Model Aircraft — The FAA considers model aircraft to be different than other UAS, and they have different regulations. Model aircraft are not used for business purposes, only for hobbies and recreation. (Use of UAS related

to Indiana University does not qualify as model aircraft regulations.) Model aircraft must be kept within visual sightline of the operator and should weigh less than 55 pounds unless certified by an aeromodelling community-based organization. Model aircraft must be flown a sufficient distance from populated areas.

Sanctions

Any violations of university policies by an individual will be dealt with in accordance with applicable university policies and procedures, which may include disciplinary actions up to and including termination from the university.

Legal prohibitions regarding physical presence on campus/trespassing and other legal action may also be pursued against third parties that operate UAS in violation of this policy.

Fines or damages incurred by individuals or units that do not comply with this policy will not be paid by University of Iowa and will be the responsibility of those persons involved.

REFERENCE DOCUMENTATION

- FAA UAS <- points to **https://www.faa.gov/uas**
- FAA UAS Fact Sheet <- points to **http://www.faa.gov/news/fact_sheets/news_story.cfm?newsId=14153**
- FAA Public Operations – Governmental <- points to **https://www.faa.gov/uas/public_operations**
- Unmanned Aircraft Systems (UAS) Regulations & Policies <- points to **https://www.faa.gov/uas/regulations_policies**
- Academy of Model Aeronautics National Model Aircraft Safety Guide <- points to **http://suas.modelaircraft.org/ama/images/sUAS_Safety_Program_web.pdf**
- Academy of Model Aeronautics National Model Aircraft Safety Code <- points to **https://www.modelaircraft.org/files/105.pdf**
- Indiana University Policy <- points to **https://policies.iu.edu/policies/ps-05-unmanned-aircraft-drones/index.html**
- University of Idaho Institutional Use Policy <- points to **https://www.uidaho.edu/policies/apm/45/35**
- University of Idaho Personal Use on Campus Policy <- points to **https://www.uidaho.edu/policies/apm/95/35**
- Drone Law Update <- points to **http://www.provideocoalition.com/drone-law-update-faa#sthash.bQTf5OEm.dpuf**