

## UNMANNED AERIAL SYSTEM USE

Unmanned aircraft systems (UASs) come in a variety of shapes and sizes and serve diverse purposes. Also known as drones, unmanned vehicle systems (UVSs) and unmanned aerial vehicles (UAVs), these devices have become increasingly popular, but have also raised privacy, security and safety concerns. To address these concerns and ensure compliance with Federal Aviation Administration regulations, appropriate guidelines must be implemented and followed. The information provided below explains the requirements for UAS operations at Yale University. All UAS activity requires prior review and authorization by Environmental Health and Safety (EHS) and the Office of Risk Management. All UAS use on the Yale University campus must be in furtherance of University activities. Purely personal use of any UAS is prohibited.

### I. Definitions

- **Pilot in Command:** The person who has final authority and responsibility for the operation and safety of the UAS flight.
- **Operator:** The person manipulating the flight controls of the UAS. In many, but not all instances, the operator will be the Pilot in Command.
- **Unmanned Aircraft:** Any contrivance invented, used or designed to navigate or fly in the air that is operated without the possibility of direct human intervention from within or on the aircraft.
- **Unmanned Aircraft System (UAS):** An Unmanned Aircraft and associated elements (including communication links and the components that control the Unmanned Aircraft) that are required for the pilot in command to operate safely and efficiently.
- **University Property:** Buildings or grounds owned, leased, operated, controlled or managed by Yale University.
- **Safety Plan:** A location-and UAS-specific document created by the requestor, in cooperation with EHS, which includes details of and requirements for the flight.
- **Hobby/Recreational Flights:** Hobby is “a pursuit outside of one’s regular occupation engaged in especially for relaxation.” Recreation is “refreshment of strength and spirits after work; a means of refreshment or diversion.” See Section IV below for more information on hobby/recreational flights.

### II. Scope

This procedure sets forth design, approval and operational requirements for the use of an Unmanned Air System. This procedure applies to:

- The operation by any person of an UAS on or above University property.
- All Yale staff, faculty and students operating UASs at any location (including international) as part of University activities or within the scope of their employment.
- The purchase of an UAS (or parts to assemble an Unmanned Air System) with Yale funds, including Yale-administered grant funds.
- The hiring of, or contracting for, UAS services by any Yale department or unit.

### III. Acquisition and Fabrication of UASs

Unmanned Air Systems are restricted items under [Yale's Policy on the Purchase of Restricted Items](#). In accordance with that Policy, the purchase of an UAS or parts to assemble an UAS requires pre-approval from EHS. The following design requirements apply to all acquisitions and fabrications of UASs:

- The weight of the aircraft (including fuel and payload) may not exceed 10lbs at the time of takeoff. Upon request, EHS may grant permission for an aircraft to exceed the 10lb limit, but in no instance may the aircraft (including fuel and payload) weigh more than 55lbs at the time of takeoff.
- Any object attached to or carried by the UAS must be secure and must not adversely affect the flight characteristics or controllability of the aircraft.
- Only radio-controlled frequencies permitted by the Federal Communications Commission (FCC) may be used.
- Unless EHS has given written approval, the aircraft should not have metal-blade propellers.
- Any aircraft that weighs in excess of 0.55lbs must register with the FAA if it will be flown outdoors. Outdoor flights are any flights that take place beyond the confines of a structure with four walls and a roof.
- The owner's name and address, as well as the aircraft's registration number, must be clearly legible and readily accessible on the aircraft. Acceptable forms of marking include permanent marker, permanent labels and engravings.

### IV. Classification of UAS Operations

UAS operations generally fall into one of two categories: (1) hobby and recreational flights; or (2) business and research flights subject to FAA regulations under 14 CFR Part 107 ("Part 107"). To qualify as a hobby/recreational flight, the UAS must be flown strictly for hobby or recreational purposes, as defined above.

Hobby/recreational purposes include flights for educational purposes that are conducted as part of a student's coursework. Such coursework may include science, technology and aviation-related curricula, or other coursework such as television and film production or the arts.

A faculty member teaching a course that includes UAS operations may provide limited flight assistance to students. However, if the faculty member's participation is more than *de minimis*, the flight will no longer qualify as a hobby/recreational. For example, a faculty member teaching an engineering course in which construction and operation of UASs are part of the curriculum may assist students with testing their designs. In contrast, if the primary purpose of the course is UAS flight instruction, a faculty member's operation of an UAS to demonstrate flight techniques would not qualify as hobby/recreational use.

Other examples of flights that do NOT qualify as hobby/recreational include:

- Flights in connection with, or in support of University business, including, but not limited to, flights to gather images and /or visual footage for use on Yale websites and/or in Yale publications.
- Any flights for which compensation is given or received, including arrangements with third-party contractors or vendors.
- Research (both applied and aeronautical) and experimental flights.

All UAS operations that do not qualify as hobby/recreational flights must comply with Part 107. In addition, a UAS operation that would qualify as hobby/recreational may elect to operate under Part 107 instead. In this instance, the UAS operation must comply with all requirements under Part 107. In deciding whether to voluntarily operate under Part 107, the operator should carefully consider the flight restrictions and pilot qualifications described in sections V and VII below.

## **V. Pilot in Command Responsibilities and Qualifications**

For hobby/recreational flights, the operator must possess or be directly supervised by someone with documented and relevant UAS experience. All operators must be at least 16 years of age. Flights under Part 107 must be conducted or directly supervised by a person who holds a current Remote Pilot in Command certificate from the FAA.

The Pilot in Command (or the operator for hobbyist flights where there is no Pilot in Command) is responsible for the following:

- Performing a pre-flight inspection before each flight to determine whether the UAS is in a safe condition for operation. The pre-flight inspection should be conducted in accordance with the FAA's [sUAS Maintenance and Inspection Best Practices](#) and with the manufacturer's inspection procedures when available.
- Verifying that all necessary approvals and certificates are obtained prior to flight.
- Ensuring that the flight is conducted in accordance with the Safety Plan and with any other applicable flight restrictions described in Section VII of this policy. (Safety Plans are discussed in Section VI below).
- Ensure that all persons directly participating in the flight are informed about emergency procedures, potential hazards and operating conditions.
- Report all incidents and near misses to EHS at 203-785-3550 or [ehs@yale.edu](mailto:ehs@yale.edu) within 24 hours.

## **VI. Procedure for Flight Approval**

Irrespective of flight location or purpose, all UAS operations (including indoor operations) must obtain pre-flight approval from EHS and the Office Risk Management (ORM). To seek approval, the operator, instructor, faculty advisor or relevant Dean should submit an [Unmanned Air System Flight Request Form](#) to EHS ([ehs@yale.edu](mailto:ehs@yale.edu)) at least 10 days prior to the anticipated flight date. The form should include the following information:

- The proposed flight date(s), time(s) and location(s).
- The purpose(s) of the flight(s).
- A description of the UAS.
- Proof of operator's qualifications and a copy of the Pilot in Command's certificate, if applicable.
- Source and nature of funding.
- Contact information.
- Description of any video, images, footage or other data which the operator proposes to collect.

In reviewing a request, EHS and ORM will consider, among other factors, the safety of persons and property, federal and local laws and privacy expectations. If the request is approved, the requestor, in cooperation with EHS, will develop a safety plan specific to the UAS and to the flight location ("Safety Plan"). The Safety Plan, which includes conditions and restrictions for the flight, must be on-hand during the UAS operation. The Safety Plan may also require the operator to obtain additional approvals from Yale Police, Yale Security, West Campus Administration and/or Facilities.

Staff, faculty or departments wishing to hire a vendor to conduct UAS operations and any third-parties wishing to fly an UAS on Yale property must have in place prior to flight a written agreement that contains appropriate insurance and indemnification provisions approved by the Office of General Counsel and the Office of Risk Management.

## VII. Flight Restrictions

In addition to any flight restrictions contained in the Safety Plan, all UAS operations must comply with the following operational restrictions and conditions:

### A. All Flights

- Must not fly in a reckless or careless manner or in a manner that may endanger persons or property.
- Must not interfere with ground vehicles or traffic.
- Must not interfere with and must always yield the right of way to manned aircraft.
- Must not fly in adverse weather conditions such as high winds.
- Must not fly under the influence of alcohol or drugs.
- Must not fly within a three-mile radius of or directly over occupied athletic facilities and stadiums.
- Must file a Notice to Airmen (NOTAM) 24 to 72 hours before every flight.
- Operations at the Yale Health Center, Yale-New Haven Hospital and the Yale School of Medicine campuses are prohibited unless specific permission is obtained from an appropriate representative from each facility, as well as from EHS and Yale Security.
- Due to the proximity of helipads at Yale-New Haven Hospital and St. Raphael's Hospital, all flights on Yale's campus must remain below 200 feet above ground level.
- Collection of data, images or footage or persons or facilities requires prior consent of the subjects, property owner or occupants.

### B. Hobby/Recreational Flights:

In addition to the flight restrictions listed in Part A, all hobby/recreational flights must comply with the following rules:

- The aircraft must remain within the visual line-of-sight of the operator.
- The aircraft must remain below 400 feet above ground level.
- Must not fly directly over people.
- Fly in accordance with a community-based set of safety guidelines, such as the Academy of Model Aeronautics National Model Aircraft Safety Code.
- Prior notification to airports and air traffic control when flying within 5 miles of any airport. Due to the proximity of Tweed-New Haven Airport, all flights on Yale's campus require prior approval from Tweed Air Traffic Control (203-468-3113) 24 to 72 hours before each flight.
- Fly at speeds greater than 5 mph without written approval.

### C. Part 107 Flights:

In addition to the flight restrictions listed in Part A, all non-hobby/non-recreational flights must comply with the following rules:

- Must remain below 400 ft above ground level.\*
- Must not fly directly over people unless those persons are in a covered structure or stationary vehicle.\*
- Maximum groundspeed of 3mph unless EHS has given prior written permission to exceed 3mph.\*
- Fly only during daylight hours.\*
- Minimum visibility of 3 miles.\*
- Flights in airspace other than Class G airspace, including flights within 5 miles of Tweed-New Haven Airport, require prior authorization from the FAA. Authorization may be obtained by submitting the FAA's online application for airspace authorization, available at [https://www.faa.gov/uas/request\\_waiver/](https://www.faa.gov/uas/request_waiver/).\*
- Minimum distance of 500 ft below and 2,000 ft horizontally from clouds.\*

\*For flights conducted under Part 107, the FAA may issue a Certificate of Waiver (“CoW”) to allow an operator to deviate from one or more of the restrictions marked with an asterisk (\*). To obtain a waiver, the petitioner must demonstrate to the FAA’s satisfaction, through supporting data or documentation, that the proposed operation can be safely conducted under the terms of the CoW. If the FAA grants the petitioner’s request for a waiver, the CoW may include additional or special provisions designed to ensure an equivalent level of safety. Any operator who would like to obtain a CoW must obtain EHS approval of his or her proposal prior to petitioning the FAA.