



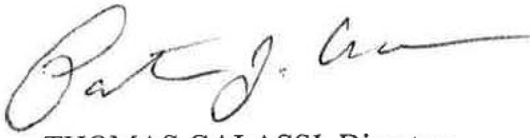
MAY 18 2018

MEMORANDUM FOR: REGIONAL ADMINISTRATORS

THROUGH:


RICHARD MENDELSON
Acting Deputy Assistant Secretary

FROM:


FOR THOMAS GALASSI, Director
Directorate of Enforcement Programs

SUBJECT: OSHA's use of Unmanned Aircraft Systems in Inspections

This memorandum addresses the use of Unmanned Aircraft Systems ("UAS" or "drones") by OSHA. UAS may be used to collect evidence during inspections in certain workplace settings, including in areas that are inaccessible or pose a safety risk to inspection personnel. UAS may also be used for technical assistance in emergencies, during compliance assistance activities, and for training. As a Federal agency, there are currently two legal frameworks available to OSHA under Federal Aviation Administration (FAA) rules for the use of UAS, either as a Public Aircraft Operator (PAO) flying missions that meet the governmental functions listed in the Public Aircraft Statute (49 U.S.C. §§ 40102(a)(41) & 40125), or as a Civil Operator under the civil rules (14 CFR part 107).

OSHA is exploring the option of obtaining a Blanket Public COA to operate UAS nationwide. In the interim, OSHA UAS operations must adhere to the following guidance.

Any Region using UAS will designate a Regional UAS Program Manager (UPM) that will oversee all program elements. The UPM shall ensure that OSHA UAS operations follow all [14 CFR part 107](#)¹ rules which include, but are not limited to, the following:

- i. Remote Pilot in Command (RPIC) shall pass an FAA Aeronautical Knowledge Test and obtain a Remote Pilot Certificate with UAS rating.
- ii. Register all UAS.
- iii. Apply and obtain approval for FAA part 107, subpart D, waiver when unable to operate under part 107 rules.
- iv. Establish and maintain logbooks for RPICs and all UAS.
- v. Report accidents to FAA (see §107.9).

Prior to using UAS for OSHA inspections, a UAS must be selected that weighs less than 55 pounds and it must be [registered](#)² with the FAA if it weighs more than 0.55 pounds (8.8 ounces). Each registered UAS must be labeled with the registration number provided by the FAA.

The Regional UPM will coordinate requests for UAS use, and make recommendations to the Regional Administrator regarding the deployment and use of UAS. The UPM will determine whether the request for UAS and mission demands can be successfully fulfilled under the FAA's rules and regulations. The UPM's recommendation will include a cost/benefit analysis and a hazard assessment.

OSHA will obtain express consent from the employer prior to using UAS on any inspection. To ensure the safety and cooperation of individuals that may be affected by the aerial inspection, personnel on site must be notified of the aerial inspection prior to launching a UAS.

The RPIC must inspect all equipment prior to each UAS operation to ensure the functionality and calibration of the UAS. UAS operations will follow the manufacturer's instructions and all applicable FAA, state, and local rules and regulations. The RPIC must comply with the operational limitations found at Subpart B of Part 107. These operational requirements include, but are not limited to:

- i. The RPIC must keep a visual line-of-sight with the UAS.
- ii. The RPIC must operate the UAS only during the day sunrise until sunset.
- iii. Flight speed must not exceed 100 mph.
- iv. The RPIC must not operate the UAS higher than 400 feet above ground, except when within 400 feet of a structure. In these cases, it is allowable to fly 400 feet above the structure's immediate uppermost limit.
- v. The UAS must yield right of way to manned aircraft.
- vi. The UAS may not operate over any persons not directly participating in the operation; unless they are under a covered structure or inside a stationary vehicle that can provide reasonable protection from a falling drone.

Recommended best practices for UAS operations are included in the Appendix to this Memorandum.

If you have any questions, please contact [\(b\) \(6\)](#) in the Office of Maritime Enforcement at [\(b\) \(6\)](#) or [\(b\) \(6\)](#).

¹ <https://www.ecfr.gov/cgi-bin/text-idx?SID=e631680c69430f9ba42e321dbd979410&mc=true&node=pt14.2.107&rgn=div5>

² https://www.faa.gov/uas/getting_started/registration/

Appendix
Recommended Best Practices for
OSHA Regional UAS Program

I. Pre-Deployment

A deployment kit should be developed, including the following items:

- Spare / extra batteries.
- Battery chargers.
- Extra memory cards.
- Two way radios.
- Binoculars.
- Laptop.
- Smart Phone or Tablet.
- Spare parts kit (rotor blades, etc.).
- Tool kit.
- UV lenses kit for UAS camera.

Pre- and post-flight checklists should be developed for each Unmanned Aircraft System (UAS) in accordance with the manufacturer's instructions. These procedures will address any ancillary system that may need servicing, for example, the backing up of data and the replacement of batteries in controller equipment.

II. Pre-Flight Operations

Before flight operations begin, the UAS Program Manager (UPM) will ensure that the mission is approved and that a qualified team is available to conduct the operation. The UPM will ensure that the UAS mission is conducted under Part 107 or a COA, but never both. A team will typically include a Remote Pilot in Command (RPIC), a Visual Observer (VO), and a safety monitor. The VO must be an OSHA employee, and may be the CSHO conducting the inspection. The VO will assist the RPIC to identify and avoid other air traffic or objects aloft and/or on the ground. The VO is responsible for notifying the RPIC of any hazardous situations and acts primarily as a safety for the RPIC, other personnel, and equipment in the area of the flight operation. The safety monitor will assist the VO and be used on locations where it is not possible for the VO to maintain visual contact with both the UAS and the RPIC. All team members, as well as other OSHA staff, will be briefed regarding mission parameters and expectations, roles and responsibilities, safety precautions, operating parameters, and limitations. If the flight is to support an inspection, the UPM along with the Compliance Officer (CSHO) will brief the team on the evidence needed and the mission of the flight. The VO must understand the evidence collection system and how to preserve it in order to assist the RPIC.

Prior to launching a UAS, a flight plan and checklist as required under Part 107.49 will be developed and will include:

- The mission to be performed.
- Pre-flight inspection of equipment.
- Go/No-Go conditions, including weather, wind and visibility.
 - (a) As a best practice, the RPIC should utilize FAA approved weather resources such as: Meteorological Terminal Aviation Weather Reports (METARS), Terminal Area Forecasts (TAF), Notices to Airmen (NOTAMs), and Temporary Flight Restrictions (TFRs) to obtain the best information.
 - (b) Wind conditions do not exceed the aircraft limits stated in the aircraft operations manual/specifications. An anemometer is a low-cost and simple to use tool that can be utilized in order to help determine if the wind speed is within the necessary limits of the UAS being flown.
 - (c) The RPIC should ensure that the flight will occur within the weather requirements specified in Part 107.51 (c-d). Basic Visual Flight Rules (VFR) are summarized as three (3) statute miles flight visibility, and the UAS must be kept at least 500 ft. below a cloud and at least 2,000 ft. horizontally from a cloud.
- Aircraft in the area.
- Employer consent to use the UAS.
- Notification of affected personnel on the site.
- Site specific hazards, i.e. cables, antenna, vehicles. Verify through the FAA B4UFly application.
- Job Hazard Analysis (a simple description of potential hazards and mitigation techniques).
- A graphic flight plan to determine routes to be used, and identify what evidence is to be collected. This can be a simple sketch of the site and planned flight routes.
- Establishment of two-way radio communication. Radios are not always required, but serve as effective communication tools when the VO or safety monitor are stationed away from the RPIC.
- A team briefing for all team members.
- Discuss interaction with people interested in the flight operations. Explain what you are doing and why.
- Notification of the operation to local air traffic control towers, including obtaining any necessary waivers.
- Verification with local law enforcement to ensure compliance with state and local ordinances.
- Checking the FAA's Notice to Airman (NOTAM) website for the local operating area. <https://notams.aim.faa.gov/notamSearch/nsapp.html#/>
- Abort procedures.
- Flight operations.

UAS use on site will be the responsibility of the senior onsite OSHA official. The RPIC will make the final determination if a flight will be conducted. When working in an area with other federal agencies and employers, coordination will be made with all parties onsite prior to using the UAS. When operating under the Incident Command Structure, the Incident Commander must approve UAS use.

All flight operations will be conducted in accordance with Federal Aviation Administration rules, state and local regulations, and applicable OSHA rules, including OSHA's Field Operations Manual. State and local governments may impose stricter guidelines concerning UAS operations. The UPM, Area Director, and RPIC are responsible for identifying and following state and local UAS laws, requirements, restrictions and/or special conditions that may be present in the area of intended operation.

The RPIC's primary mission is to safely complete the flight plan. The RPIC is ultimately responsible for the UAS operation's safety and has the authority to not conduct or abort a mission for any reason. Furthermore, the RPIC will ensure that each UAS mission adheres strictly to the operational limitations set forth in FAA Part 107 rules or any applicable Part 107 waiver. The RPIC will also ensure that UAS missions authorized by Part 107 civil rules remain separate from UAS missions authorized by a COA.

The VO and safety monitor's primary responsibilities are to assist the RPIC in maintaining situational awareness and alerting the RPIC of unsafe or unforeseen circumstances. The VO and safety monitor will make recommendations to the RPIC on conditions at the flight operation site and will invoke the abort procedures if required.

III. Post-Flight Field Procedures

A post-flight field checklist should be followed based on the type of UAS system used. Each UAS should have its own checklist in accordance with manufacturer's instructions. As a minimum, the checklist will address the following:

- Inspection of the UAS airframe, antenna, motors, and electronics for visual damage. Remove debris and clean if necessary.
- Camera is free of damage and lens is clean.
- Gimbal, if equipped, is free of damage and secured for transport.
- Rotor blades are free of damage and clean; remove from UAS for transport.
- Batteries are removed from UAS, and any other equipment (e.g., the camera), visually inspected, and stored for transport.
- Document UAS battery use in maintenance logbook.
- Collect and preserve data from onboard recording systems, if equipped.
- Debrief team members and complete the flight report, which includes mission details, accomplishments, successes/failures, and all equipment used in the operation.
- Reset equipment for use.
- Copy data to CD or other suitable media, and reformat disk(s) as necessary.
- Charge batteries as necessary.

- Clean lenses of cameras, monitors, and any other equipment used for visual awareness during flight.

IV. Post-Flight Office Procedures

After each UAS operation, the team should report to the UPM and the support office. The report should provide the UPM and AD with the following:

- Post-flight briefing, including the documented flight report (see paragraph V.).
- Mission summary description.
- Mission Accomplishments and any outstanding actions.
- Successes/failures for the UAS operation to develop lessons learned.

After each UAS operation, the following items should be completed:

- Copy data to CD or other suitable media, and reformat disk(s) as necessary.
- Charge batteries in accordance with manufacturer's instructions.
- Store equipment in accordance with office procedures and the manufacturer's recommend actions.

V. Flight Report

The RPIC and/or the VO should complete and submit a flight report to the Area Director, with a copy to the UPM, within one business day of the flight. The flight report should discuss the mission and any relevant information about the operation of the UAS or the procedures. The flight report should also include the team members involved in the operation, date and times of flights, location of operation, operational airspace flown in, UAS flight specifics (maximum altitude, maximum distance, weather conditions, cloud/fog clearance, wind speed, and visibility), type of UAS used, identification number of UAS, and a brief description of the information gathered. A copy of the flight report should be placed in the inspection casefile.

VI. Program Monitoring and Evaluation

The UPM should collect and evaluate the flight reports, identify trends, best practices, lessons learned, training issues, planning issues, and any equipment / supply needs. The UPM should report to the Regional Administrator on the status of the program annually.

VII. Training

The key to continued safe operations is through maintaining a professional level of competency. The first step in the process is establishing minimum qualifications for selecting potential operators and crew members, and the second step involves training those personnel.

A Regional training plan shall be developed by the UPM and receive approval from the Regional Administrator. This program shall address the following subjects:

- Initial Training.
- Recurrent Training.
- Training Base Tasks – Pilot [RPIC].
- Training Base Tasks – Visual Observer [VO].

VIII. Recordkeeping

The FAA requires that UAS be maintained according to the manufacturer's recommended maintenance schedule. OSHA UAS will be maintained according to each UAS manufacturer's prescribed maintenance schedule, and maintenance must be performed after each operation. If the manufacturer does not have a prescribed program, the UPM will develop one. Additionally, OSHA should conduct an inspection of each UAS every 20 hours of flight time which includes, but is not limited to, normal maintenance procedures and the following:

- Airframe inspection and replacement of necessary components. Replaced components will be placed out of service.
- On-board and exterior electronic component inspection and replacement of necessary components. Replaced components will be placed out of service.
- Mandatory rotor blade (propeller) replacement. Replaced rotor blades will be placed out of service.
- Testing of all batteries (onboard and exterior) which includes; voltage, amperage testing, and replacement of necessary batteries. Failed batteries will be placed out of service.
- Software and firmware updates to the most current versions for all components and systems.

The FAA requires that logbooks be maintained for each RPIC *and* each UAS.

RPICs are responsible for maintaining their own logbook. RPIC logbooks must contain at a minimum the requirements imposed by the FAA, which includes, but is not limited to:

- a. Name and certificate number of the RPIC.
- b. UAS name and registration number.
- c. Dates of flights.
- d. Times of flights, which also includes the duration of each flight.
- e. Location of flights, which also includes the total distance of each flight.
- f. Weather conditions during flights.
- g. Visibility condition during flights.
- h. National Airspace System (NAS) operated in.
- i. Waivers and/or approvals obtained by the FAA or airport operators.
- j. Individuals involved in the operation (i.e. UPM, VO, Safety Monitor, etc.).
- k. Day or night (with approved waiver) operation.
- l. Notes on any maintenance issues, equipment failures, or accidents.
- m. Other aircraft involved in the operation, if any.

The UPM and RPIC are responsible for ensuring that UAS logbooks are kept and maintained according to FAA requirements. The UPM will make logbooks available to be kept for each UAS in the regional fleet. The information logged will include, but is not limited to:

- Field use (missions) and flight time (hours).
- Maintenance performed during operations (pre & post).
- 20 hour maintenance inspection results.
- Document the use of each battery for each UAS system.

IX. Accident Reporting

The FAA requires notification of certain UAS accidents. The applicable FAA regulation under part 107.9 states:

No later than 10 days after an operation that meets the criteria of either paragraph (a) or (b) of this section, a RPIC must report to the FAA in a manner acceptable to the Administrator, any operation of the UAS involving at least:

- (a) Serious injury to any person or any loss of consciousness; or
- (b) Damage to any property, other than the UAS, unless one of the following conditions is satisfied:
 - (1) The cost of repair (including materials and labor) does not exceed \$500; or
 - (2) The fair market value of the property does not exceed \$500 in the event of total loss.

Accidents of UAS during flight meeting the qualifying factors in this section must submit a report through the [FAA's DroneZone Portal](#).

In addition to the FAA required notifications, the Regional Administrator will be notified if an FAA reportable accident occurs. The Regional Administrator will determine if the event is significant enough to report to the National Office.