

INDUSTRY-WIDE LABOR-MANAGEMENT SAFETY COMMITTEE

SAFETY BULLETIN #36

RECOMMENDED GUIDELINES FOR SAFELY WORKING AROUND UNMANNED AIRCRAFT SYSTEMS (UAS) a.k.a. DRONES

One of the primary uses of Unmanned Aircraft Systems (UAS) in production is for aerial cinematography. UAS can be used to capture scenic shots, complicated shots, and shots that may be potentially hazardous for humans to film. UAS are also used as props, to scout locations, or may even be a part of the story. These guidelines cover the rules and regulations for the safe use of UAS during motion picture and television operations, including, but not limited to, camera platforms, image and data capture, light special effects, location scouts, and when the UAS is flown as a prop.

UAS combines the use of aeronautics, electronics, and wireless transmission technologies through the use of remote-controlled or programmable units. UAS types include, but are not limited to, unmanned single and multi-rotor helicopters, fixed-wing aircraft, small UAS, or micro UAS.

Rules and Regulations

While this safety bulletin details the Federal Aviation Administration (FAA) regulations, other rules may apply outside of the United States, and your company's policies may be more restrictive. Outdoor use of UAS must follow federal, state, and local regulatory limitations or restrictions, including FAA Small UAS Rule [14 Code of Federal Regulations \(CFR\) Part 107](#) (Part 107), and 49 U.S.C. §44807, as well as any Authority Having Jurisdiction (AHJ) regulations, as applicable. Part 107 establishes four (4) new categories of small UAS that weigh less than 55 pounds at takeoff and, under certain conditions for each category, allow for UAS operations over people, moving vehicles, flying at night, and sustained flight over open-air assemblies without the need to obtain a waiver from the FAA.

Details of these categories and required conditions will be covered in *Safety Bulletin #36 - Addendum "A" - Federal Aviation Administration (FAA) Rules & Regulations.*

Guidelines for Operation

1. The Pilot in Command (PIC) is the final authority over the UAS, shall be in command over all flight operations and/or related activities, and shall be certified and trained, as appropriate. The PIC shall have the final authority to abort any flight operation. Abort signals shall be specified ahead of time.
2. The PIC and/or UAS Operator may designate a person knowledgeable of the flight operations to perform the duties or requirements listed in these guidelines, other than operating the UAS.
3. The PIC or UAS Operator, in consultation with the designated production representative, must ensure that any UAS operations will not pose any undue hazards to other people, other aircraft, or other property in the event of a loss of control of the aircraft.
4. Prior to each flight, the boundaries and intended flight path shall be cleared for UAS operations.

5. Equipment and/or aftermarket modifications shall not be attached to, nor altered on, the UAS without authorization from the PIC.
6. Prior to each flight, the UAS should be inspected by the PIC* to determine that the UAS is safe for flight.
7. The PIC* will establish communication protocols with the designated production representative to implement a plan for communications.
8. The PIC* is responsible for determining whether there are any potential radio frequencies or electrical transmissions (devices such as cameras, Wi-Fi routers, and mobile phone boosters or repeaters) that could interfere with the safe operation of the UAS. Production and cast & crew members with electronic or transmission equipment should contact the PIC* to see if it may affect the operation of the UAS.
9. An exclusion zone must be established for the setup, testing, takeoff, and landing of the UAS. This zone shall be cleared of all debris, including trash or anything else that may adversely impact the operation of the UAS. All equipment (e.g., cameras, lights, sound booms) shall be placed at a safe distance away from the zone.
10. Unless authorized by the PIC*, no personnel shall approach the UAS, or enter the exclusion zone, whether the UAS is running or not.
11. Access to areas where UAS are in operation shall be limited only to persons authorized by the PIC. All other personnel shall remain at a designated safe distance. If needed to prevent unintentional entry into potentially hazardous areas, warning signs should be posted and/or other appropriate precautions taken.
12. Never throw anything at or near the UAS.
13. Personal Protective Equipment (PPE), such as earplugs, shall be provided and worn, as appropriate.
14. Appropriate precautions (i.e., fire extinguishers, no smoking) shall be implemented for flammable fuel sources.
15. The flying accuracy of the UAS may be adversely affected by natural conditions such as wind, air density, temperature, gross weight, humidity, and time of day. Conditions such as center of gravity of the UAS, wind (fans), water, explosives, and disturbed airflow can also affect the flight dynamics of the UAS.
16. There may be times when the UAS is used as an airborne prop. Safety precautions for this type of use shall correspond to the risk it presents. Even when used as a prop, the use of the UAS must comply with all applicable rules and regulations.
17. Once the UAS is airborne, no change will be made to the flight plan without authorization from the PIC.
18. The storage and transportation of batteries shall be in compliance with all applicable federal, state, and local laws and regulations and any shipping company restrictions. For

transportation of batteries by air, refer to airline policy and International Air Transport Association (IATA) regulations. Refer to the production company's battery safety policy, and the Industry-Wide Labor-Management Safety Committee Safety & Health Awareness Sheet – *Lithium-Ion Battery Safety*, for additional information.

Briefing/Safety Meetings

Prior to flight operation, the PIC, or a designated person knowledgeable of the flight operation, and the designated production representative, will conduct a briefing/safety meeting for all cast & crew who are expected to work in proximity to the flight operation. Subsequent briefings/safety meetings may be necessary to address cast and crew members' concerns regarding other sequences, changes, and/or additional scenes.

Briefings/Safety Meetings shall include a discussion of the following:

- Possible risks to personnel involved
- Safeguards to personnel, animals, and equipment
- Communications, including chain of command
- Electronic devices and/or other equipment that may interfere with UAS operations
- Emergency procedures
- Abort signals, audible and/or visual, used to halt filming in the event of unforeseen circumstances or safety hazards
- Boundaries and intended flight paths, including designated exclusion zone(s)
- Additional safety precautions unique to the UAS operation that need to be taken, including operations at night, over people, indoors, or in close proximity to cast or crew
- Any intended stunts or special effects during UAS operations
- Obstacles, equipment, and/or locations that may present a hazard
- Federal, state, and local regulatory limitations or restrictions, if applicable

Indoor UAS Use

The indoor use of UAS is not regulated by federal regulations; however, AHJ regulations and employer policies may apply.

1. As a general matter of safe work practices, the "Guidelines for Operation" and "Notification" procedures listed in this document should be followed during indoor UAS operations.
2. Indoor conditions, such as increased heat resulting in reduced air density and ventilation systems, could adversely affect flying characteristics.
3. The PIC* and the designated production representative should evaluate the indoor location for

items such as interior sets, walls, perms/greenbeds, lighting equipment, rigging, cables, Heating, Ventilation and Air Conditioning (HVAC) equipment, etc. These potential hazards should be considered prior to operation of the UAS.

4. Be aware of the proximity of the UAS to cast & crew, and/or a live audience, if applicable.

Notification

The Production Company shall notify all production personnel of the planned use of UAS so that any objection can be communicated prior to UAS operation. Notification can be accomplished by including a statement like the following on the call sheet:

“An Unmanned Aircraft System (UAS) will be used in close proximity to production personnel and equipment. Any personnel who do not consent to work within the UAS area must notify [please insert the assigned production designee(s)] prior to use of the UAS.”

Note: California Code of Regulations (CCR), Title 8, § 11707 restricts minors under the age of 16 from working in close proximity to the functioning parts of unguarded and dangerous moving equipment, aircraft, or vessels, or functioning blades or propellers. Your studio or AHJ may have additional restrictions for minors.

A COPY OF THIS BULLETIN SHOULD ACCOMPANY THE CALL SHEET ON DAYS THAT THE UAS IS BEING UTILIZED.

* Or a person knowledgeable of the flight operation that has been designated by the UAS Operator.

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“ADDENDUM A” – FEDERAL AVIATION ADMINISTRATION (FAA) RULES & REGULATIONS

When working outdoors in the United States and its territories, the production and UAS Operators are subject to all applicable FAA rules and regulations.

Productions should review this Addendum in addition to the guidelines outlined in Safety Bulletin #36.

Note: California Code of Regulations (CCR), Title 8, § 11707 restricts minors under the age of 16 from working in close proximity to the functioning parts of unguarded and dangerous moving equipment, aircraft, or vessel, or functioning blades or propellers. Your studio or Authority Having Jurisdiction (AHJ) may have additional restrictions for minors.

If the production wishes to use a UAS that weighs 55 pounds or more on takeoff, including everything that is on board or otherwise attached to the aircraft, or if your operation includes a non-waivable Part 107 rule, then the UAS Operator must apply for an exemption in accordance with 49 United States Code (U.S.C.) § 44807 (formerly referred to as Section 333 exemption). 49 U.S.C. § 44807 grants the Secretary of Transportation the authority to use a risk-based approach to determine if certain unmanned aircraft systems may operate safely in the National Airspace System (NAS) on a case-by-case basis. A list of approved UAS weighing 55 pounds or more can be found here: <https://www.regulations.gov/document/FAA-2023-1271-0011>. The production should confirm that the operator is using an approved UAS or has obtained this exemption prior to operation.

FAA 14 Code of Federal Regulations (CFR) 107.200 Waiver Policy and Requirements

There are specific UAS operations where the production would require a waiver from Part 107 rules, such as operating the UAS from a moving vehicle or flying over 400 feet above ground level. The FAA may issue a certificate of waiver authorizing a deviation from any regulation specified in § 107.205 if the FAA finds that the proposed small UAS operation can safely be conducted under the terms of that certificate of waiver. A request for a certificate of waiver must contain a complete description of the proposed operation and justification that establishes that the operation can safely be conducted under the terms of a certificate of waiver. Operations requiring a waiver are listed at the end of this addendum.

Pilot Certification

To operate the controls of a drone under Part 107, the Pilot in Command (PIC) must have a remote pilot certificate with a small UAS rating and have completed all recurrent training requirements or be under the direct supervision of a person who holds such a certificate. The requirements to become a certified remote pilot can be found on the FAA website at:

https://www.faa.gov/uas/commercial_operators/become_a_drone_pilot.

The UAS Operator or PIC must have available onsite their authorization documentation or waivers from the proper regulatory authority prior to any flight operations, as necessary. The documentation must be provided to the regulatory authority upon request.

All UAS shall have an FAA registration number and be labeled as applicable. In addition, the PIC shall verify that the aircraft is Remote ID compliant by one of the following two methods:

1. **Standard Remote ID Drone**, which broadcasts identification and location information about the drone and control station. A Standard Remote ID drone is one that is produced with built-in FAA Remote ID broadcast capabilities.
2. **Remote ID Broadcast Module** attached, which broadcasts identification and location information about the drone and its take-off location. The broadcast module can be added to a drone to retrofit it with FAA Remote ID broadcast capabilities.

Operation Over People

Federal regulations allow operations over people under certain circumstances without the need for those operations to receive individual Part 107 waivers from the FAA. An operational waiver would still be required when a PIC deviates from certain rules under Part 107, as long as it can be demonstrated that they can still fly safely using alternative methods.

Waivers are not necessary for operations over people where:

1. They are participating personnel in the flight operations of the UAS; or
2. Persons authorized by the PIC are located under a covered structure or inside a stationary vehicle that can provide reasonable protection from a falling UAS; or
3. The operation meets the requirements of at least one of the four operational categories specified below.

For the purposes of outdoor filming, Federal regulations define flying “over” people as the UAS flight path being directly over any part of a person. For example, a UAS that hovers or transits directly over a person’s head, shoulders, extended arms, or legs would be an operation over people.

For the purposes of outdoor filming, Federal regulations define “participating personnel” as ONLY those who are directly participating in the safe operation of the UAS, such as the PIC and/or Visual Observer.

UAS Categories 1, 2, 3, and 4

- **Category 1** operations over people are permitted using a small, unmanned aircraft that:
 - a) Weighs 0.55 pounds or less, including everything that is attached to the aircraft throughout the duration of each operation; and
 - b) Does not contain any exposed rotating parts that would lacerate human skin on impact; and

- c) The PIC does not operate the UAS in sustained flight over open-air assemblies unless the operation meets the applicable remote broadcast identification requirements.
- **Category 2** operations over people are permitted using unmanned aircraft that weigh more than 0.55 pounds but do not have an airworthiness certificate and comply with the following requirements:
 - a) Must display a label on the aircraft indicating eligibility to conduct Category 2 operations, have current remote pilot operating instructions to operate the UAS, and be subject to a product support and notification process; and
 - b) Must be designed, produced, or modified such that it will not cause injury to a human being that is equivalent to or greater than the severity of injury caused by a transfer of 11 foot-pounds (ft-lbs.) of kinetic energy upon impact from a rigid object; and
 - c) Does not contain any exposed rotating parts that would lacerate human skin on impact; and
 - d) The unmanned aircraft does not contain any safety defects; and
 - e) The PIC does not operate the UAS in sustained flight over open-air assemblies unless the operation meets the applicable remote broadcast identification requirements.
- **Category 3** operations are prohibited over open-air assemblies. Operations over people may only take place if:
 - a) The operation is within or over a closed or restricted-access site, and everyone within that site has been notified that a small UAS may fly over them; or
 - b) If not in a closed or restricted access site, the UAS does not maintain sustained flight over any person unless that person is authorized directly in the operation of the UAS, or located under a covered structure, or inside a stationary vehicle that can provide reasonable protection from a falling UAS.
 - c) The Category 3 UAS must also comply with the following requirements:
 - Must display a label on the aircraft indicating eligibility to conduct Category 3 operations, have current remote pilot operating instructions to operate the UAS, and be subject to a product support and notification process.
 - Must be designed, produced, or modified such that it will not cause injury to a human being that is equivalent to or greater than the severity of injury caused by a transfer of 25 ft-lbs. of kinetic energy upon impact from a rigid object.
 - Does not contain any exposed rotating parts that would lacerate human skin on impact.

- The unmanned aircraft does not contain any safety defects.
- **Category 4** operations allow a UAS-issued airworthiness certificate under Part 21 to operate over people, so long as the operating limitations specified in the approved Flight Manual, or as otherwise specified by the FAA Administrator, do not prohibit operations over people. The UAS airworthiness certificate must be continued and maintained as required by the FAA. Additionally:
 - a) Sustained flight over open-air assemblies is allowed if the Category 4 UAS meets applicable remote identification operation and broadcast requirements.
 - b) The operator must maintain records of maintenance performed on the aircraft as well as records documenting the status of life-limited parts.

Note: Sustained flight over an open-air assembly includes hovering above the heads of persons gathered in an open-air assembly, flying back and forth over an open-air assembly, or circling above the assembly in such a way that the UAS remains above some part of the assembly. Sustained flight over an open-air assembly of people in a Category 1, 3, or 4 operation does not include brief, one-time transiting over a portion of the assembled gathering, where the transit is merely incidental to a point-to-point operation unrelated to the assembly.

Examples of "Open Air Assemblies" may include sporting events, concerts, parades, protests, political rallies, community festivals, or parks and beaches during certain events.

Operations Over Moving Vehicles

No person may operate a UAS over a human being located inside a moving vehicle unless the following conditions are met:

- For an operation under Category 1, Category 2, or Category 3, the UAS aircraft, throughout the operation:
 - a) Must remain within or over a closed- or restricted-access site, and all people located inside a moving vehicle within the closed- or restricted-access site must be on notice that a UAS may fly over them; or
 - b) If the operation is not within or over a closed- or restricted-access site, the UAS aircraft must not maintain sustained flight over moving vehicles.
- For a Category 4 operation, the UAS must:
 - a) Have an airworthiness certificate issued under Part 21 of FAA regulations; and
 - b) The applicable operating limitations in the approved Flight Manual, or as otherwise specified by the FAA Administrator, do not prohibit such operation.

Operations At Night (30 minutes after official sunset to 30 minutes before official sunrise)

- No person may operate a UAS at night unless:

- a) The PIC of the UAS has completed an initial knowledge test or training, as applicable.
- b) The UAS has anti-collision lighting visible for at least 3 statute miles that has a flash rate sufficient to avoid a collision. The PIC may reduce the intensity of, but may not extinguish, the anti-collision lighting if they determine that, because of operating conditions, it would be in the interest of safety to do so.

Note: Notwithstanding the above, your company's policies may be more restrictive. Verify policies and obtain proper approvals before performing flights over people or moving vehicles, and/or at night.

Certificates of Waivers

The following is a list of Part 107 rules that require a waiver. The FAA may prescribe additional limitations that the FAA considers necessary. A person who receives a certificate of waiver issued under this section: (1) may deviate from the regulations to the extent specified in the certificate of waiver; and (2) must comply with any conditions or limitations that are specified in the certificate of waiver.

- **§ 107.25 Operation from a Moving Vehicle or Aircraft** – Fly a small UAS from a moving aircraft or a vehicle in populated areas.
- **§ 107.29 Operation at Night** – Fly a small UAS at night or during periods of civil twilight and nighttime without anti-collision lighting.
- **§ 107.31 Visual Line of Sight Aircraft Operation** – Fly a small UAS beyond your ability to clearly determine the position, altitude, attitude, and movement of the small UAS, with unaided vision.
- **§ 107.33 Visual Observer** – Use a visual observer without following all visual observer requirements.
- **§ 107.35 Operation of Multiple Small Unmanned Aircraft** – Fly multiple small UAS with only one remote pilot.
- **§ 107.37 Operation Near Aircraft; Right-of-Way Rules** – Fly small UAS over, under or ahead of an aircraft.
- **§ 107.39 Operation over Human Beings** – Fly over a person with a small UAS which does not meet conditions of operational categories 1, 2, 3, or 4.
- **§ 107.51 Operating Limitations for Small Unmanned Aircraft** – Fly a small UAS over 100 miles per hour groundspeed, over 400 feet above ground level, with less than 3 statute miles of visibility, or within 500 feet vertically or 2000 feet horizontally from clouds.
- **§ 107.145 Operation over Moving Vehicles** – Fly over moving vehicles with a small UAS which does not meet conditions of operational categories 1, 2, 3, or 4.

FAA News



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SUMMARY OF SMALL UNMANNED AIRCRAFT RULE (PART 107)

Operational Limitations	• Unmanned aircraft must weigh less than 55 lbs. (25 kg). • Visual line-of-sight (VLOS) only; the unmanned aircraft must remain within VLOS of the remote pilot in command and the person manipulating the flight controls of the small UAS. Alternatively, the unmanned aircraft must remain within VLOS of the visual observer. • At all times the small unmanned aircraft must remain close enough to the remote pilot in command and the person manipulating the flight controls of the small UAS for those people to be capable of seeing the aircraft with vision unaided by any device other than corrective lenses. • Small unmanned aircraft may not operate over any persons not directly participating in the operation, not under a covered structure, and not inside a covered stationary vehicle. • Daylight-only operations, or civil twilight (30 minutes before official sunrise to 30 minutes after official sunset, local time) with appropriate anti-collision lighting. • Must yield right of way to other aircraft. • May use visual observer (VO) but not required. • First-person view camera cannot satisfy "see-and-avoid" requirement but can be used as long as requirement is satisfied in other ways. • Maximum groundspeed of 100 mph (87 knots). • Maximum altitude of 400 feet above ground level (AGL) or, if higher than 400 feet AGL, remain within 400 feet of a structure. • Minimum weather visibility of 3 miles from control station. • Operations in Class B, C, D and E airspace are allowed with the required ATC permission. • Operations in Class G airspace are allowed without ATC permission. • No person may act as a remote pilot in command or VO for more than one unmanned aircraft operation at one time. • No operations from a moving aircraft. • No operations from a moving vehicle unless the operation is over a sparsely populated area. • No careless or reckless operations. • No carriage of hazardous materials.
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	• Requires preflight inspection by the remote pilot in command. • A person may not operate a small unmanned aircraft if he or she knows or has reason to know of any physical or mental condition that would interfere with the safe operation of a small UAS. • Foreign-registered small unmanned aircraft are allowed to operate under part 107 if they satisfy the requirements of part 375. • External load operations are allowed if the object being carried by the unmanned aircraft is securely attached and does not adversely affect the flight characteristics or controllability of the aircraft. • Transportation of property for compensation or hire allowed provided that- - o The aircraft, including its attached systems, payload and cargo weigh less than 55 pounds total; - o The flight is conducted within visual line of sight and not from a moving vehicle or aircraft; and - o The flight occurs wholly within the bounds of a State and does not involve transport between (1) Hawaii and another place in Hawaii through airspace outside Hawaii; (2) the District of Columbia and another place in the District of Columbia; or (3) a territory or possession of the United States and another place in the same territory or possession. • Most of the restrictions discussed above are waivable if the applicant demonstrates that his or her operation can safely be conducted under the terms of a certificate of waiver.
Remote Pilot in Command Certification and Responsibilities	• Establishes a remote pilot in command position. • 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 does hold a remote pilot certificate (remote pilot in command). • To qualify for a remote pilot certificate, a person must: - o Demonstrate aeronautical knowledge by either: ▪ Passing an initial aeronautical knowledge test at an FAA-approved knowledge testing center; or ▪ Hold a part 61 pilot certificate other than student pilot, complete a flight review within the previous 24 months, and complete a small UAS online training course provided by the FAA. - o Be vetted by the Transportation Security Administration. - o Be at least 16 years old. • Part 61 pilot certificate holders may obtain a temporary remote pilot certificate immediately upon submission of their application for a permanent certificate. Other applicants will obtain a temporary remote pilot certificate upon successful completion of TSA security vetting. The FAA anticipates that it will be able to issue a temporary remote pilot certificate within 10 business days after receiving a completed remote pilot certificate application. • Until international standards are developed, foreign-

	certificated UAS pilots will be required to obtain an FAA-issued remote pilot certificate with a small UAS rating. A remote pilot in command must: • Make available to the FAA, upon request, the small UAS for inspection or testing, and any associated documents/records required to be kept under the rule. • Report to the FAA within 10 days of any operation that results in at least serious injury, loss of consciousness, or property damage of at least \$500. • Conduct a preflight inspection, to include specific aircraft and control station systems checks, to ensure the small UAS is in a condition for safe operation. • Ensure that the small unmanned aircraft complies with the existing registration requirements specified in § 91.203(a)(2). A remote pilot in command may deviate from the requirements of this rule in response to an in-flight emergency.
Aircraft Requirements	• FAA airworthiness certification is not required. However, the remote pilot in command must conduct a preflight check of the small UAS to ensure that it is in a condition for safe operation.
Model Aircraft	• Part 107 does not apply to model aircraft that satisfy all of the criteria specified in section 336 of Public Law 112-95. • The rule codifies the FAA's enforcement authority in part 101 by prohibiting model aircraft operators from endangering the safety of the NAS.