

Unmanned Aircraft Systems Guidance

Introduction

The University of Maine System (UMS) advances learning and discovery through excellence, innovation, and research-based knowledge, and recognizes that the operation of unmanned aircraft systems (UAS) has the potential to enhance our teaching, research, and public service missions.

However, as domestic UAS continues to grow, to have concerns about safety, privacy, regulation, and the potential for abuse. These general guidelines have been developed to assist departments with UAS planning and operations in support of University activities, to help reduce risks to safety, security, and privacy. Additional guidance is available in Appendix A, *UAS Checklist* and Appendix B, *Unmanned Aerial System (Drone) Occupational Safety Guidance*.

Purpose and Scope

This document applies to:

- University of Maine System (UMS) employees and students operating unmanned aircraft systems in any location as part of their University employment or as part of University activities;
- the operation by any person of UAS on or above UMS property for any reason (e.g., marketing/communication, institutional partnerships);
- the purchase of UAS with funding through the University of Maine System, including university accounts, grants, or University Foundation accounts, and;
- the hiring or contracting for any UAS services by a UMS department, as well as outside entities wishing to use a drone on a campus for any reason. (e.g. – construction time lapse, drone races, R&D proof of concept, agriculture crop evaluation).

NOTE: For operation of small UAS (sUAS) that do not meet FAA requirements for registration, the scope of this document still applies, as it pertains to FAA document number AC 107-2, available on FAA.gov. If sUAS units are necessary, coordinate directly with Risk Management (RM) to meet liability concerns.

NOTE: Indoor flight of UAS is currently prohibited within UMS. If indoor flight is necessary, coordinate directly with RM for variance. Night flight is also prohibited.

NOTE: University of Maine at Augusta (UMA), UMA Bangor, and University of Maine at Presque Isle (UMPI) are located in restricted airspace. A portion of the University of Maine at Machias (UMM) airspace is prohibited by UMM. Please keep in mind waivers to restrictions must be filed well in advance.

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1. Responsibilities

The operation of UAS is regulated by the Federal Aviation Administration (FAA) and relevant state law. UMS has established procedures required to ensure compliance with those legal obligations and to reduce risks to safety, security, and privacy.

The UMS must comply with FAA requirements, state laws, 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. There are requirements surrounding the rights of property owners. If flying over public or private land and recording / streaming video or pictures, contact UMS General Counsel.

The departments below have responsibilities applicable to their work with UAS. Many of the responsibilities need to be conducted in conjunction with other business units (e.g. – RM & the department for UAS licensing) to be successful. In addition to this document, there should be standard operating procedures and protocols developed to address their specific UAS operations. It is the responsibility of the Department who is performing the work, contracting the work, or liaising with an entity using the UAS (hereinafter referred to as “Responsible Department”) to meet all requirements prior to initiation of work.

This document is not all-encompassing (e.g. - some municipalities and locations will require additional measures) and will require those who operate UAS to provide feedback to UMS General Services so that appropriate changes can be made annually.

2. Responsible Department

- Assign a Responsible Department Point of Contact who will oversee the operation.
- Consult with relevant departments which have substantial experience with UAS operations.
 - As of 2020, the most experienced point of contact within UMS is Daniel Leclair, Director of UAS Education & Research, 207-344-9088, located at UMA.
- When/if necessary, develop department-specific standard operating procedures (SOPs) for UAS purchasing, planning, and operations.
 - Ensure the UAS or sUAS meet ASTM F3298-19 or F2910-14 if applicable.
- Coordinate with RM for UAS licensing and insurance requirements.
 - Department must submit third party certificates of insurance to RM for review
 - Must receive affirmative confirmation from RM prior to proceeding
- When hosting/liasing with contractors, vendors, or other outside / inside entities for UAS operations:
 - Must form and maintain partnership to ensure Department maintains overall control of operation.
 - Must provide that entity’s proof of insurance to RM.
 - Must submit certificates of insurance to RM for review.
 - UMS must be listed as Additional Insured.
 - Must receive affirmative confirmation from RM prior to proceeding.
- Coordinate with campus Police Department / Security for campus-specific requirements applicable to UAS operations.

- For campuses without campus police, coordinate with campus security and/or safety departments (you may need to coordinate with local law enforcement if local ordinances exist.)
- If recording or streaming video / pictures on a campus, inform the campus marketing and communications office well in-advance to describe the activity proposed.
- If flying over private or public land, and recording / streaming video / pictures, contact general counsel.
- When/if necessary, coordinate with SM for occupational safety of University employees.
- When/if necessary, complete a fieldwork safety plan for UAS operations.
- Provide department-specific UAS training to all students/employees involved in UAS operations.
- When/if necessary, complete Appendix A and review with affected personnel.
- Ensure that if incidents occur in relation to UAS operations, contact RM.
- Coordinate with RM, SM, and other departments who perform UAS work to hold meetings, make changes, and update this document as needed.

3. Risk Management

- Manages UMS list of authorized UAS pilots.
- Assesses liability and risk for UAS operations when initiated by Responsible Department wishing to perform work.
- Ensures adequate insurance coverage for UAS operations.
- When requested, coordinates with Responsible Department on UAS purchasing, planning, and operation.
- When requested, assists in “stakeholdering” efforts with Safety Management, Human Resources and Security / Public Safety to participate in meetings, make changes, and update this document.

4. Safety Management

- When requested by RM, Public Safety, Campus Security, or the Responsible Department, provide occupational safety consultation on UAS purchasing, planning, and operation, to include:
 - Purchasing considerations
 - Workplace setup
 - Test flight planning
 - Landing site safety
 - Charging and storage considerations
- Encourage the use of the Hierarchy of Controls to identify and mitigate hazards for personnel.
- When requested, assist in “stakeholdering” efforts with Risk Management to participate in meetings, make changes, and update this document.
- When requested, assist Responsible Department with field safety or other applicable occupational safety programs which may be applicable to specific UAS operations.

5. Police Department or Campus Security

- When requested, provide the Responsible Department with campus-specific information/requirements applicable to UAS operations.

6. General Counsel

- When requested, provide guidance to RM, SM, Police and Security on legal obligations surrounding private and public property, recording and legal obligations of the University and Responsible Department or person.

Appendix A- UAS Checklist

The following checklist is designed to assist Responsible Departments in planning for UAS operations to assist in mitigating risks and ensuring safe operations. This document should be kept by the Responsible Department for liability / occupational safety and for future reference. This document should be completed initially and re-accomplished whenever changes to risk, location, or named personnel necessitate another review.

General Information:					
Purpose of Flight:					
Location of Flight:					
Responsible Department Point of Contact:					
Pilot in Command:		Number of Visual Observers:			
Qualifications:			Yes	No	N/A
Is/are the operator(s) licensed and authorized to operate the UAS? <ul style="list-style-type: none"> If not, contact Risk Management. 					
Has RM been consulted with for insurance requirements? <ul style="list-style-type: none"> Third party certificates of insurance must be submitted to RM for review, and confirmation received from RM prior to proceeding 					
Does the UAS meet ASTM design and construction standards for UAS? <ul style="list-style-type: none"> If not, contact Risk Management. 					
If sUAS, does this operation conform to FAA document AC 107-2, available from FAA.gov?					
Does this operation conform to FAA document AC 20-184, for installation and operation of lithium batteries, available from FAA.gov?					
Has the operator read the manufacturer's manual to understand all operating characteristics and associated risks?					
FAA Reg Number for the pilot <u>and</u> UAS/ sUAS:					
Risk Assessment:			Yes	No	N/A
Does this flight plan require a two-person (minimum) team for operation? <ul style="list-style-type: none"> Two-person minimum required for: <ul style="list-style-type: none"> Off-campus operations UAS weighing more than 50 lbs. 					
Fieldwork:			Yes	No	N/A
(Off-campus operation) Review UMS Fieldwork Safety Program, available on the Safety Management website.					

	Yes	No	N/A
(Off-campus operation) Are emergency medical services available in close proximity to UAS operation area? NOTE: OSHA has long interpreted the term “near proximity” to mean that emergency care must be available within no more than 3-4 minutes from the workplace. If not available, then at least one employee must be trained in first aid and, possibly, bloodborne pathogens training; adequate first aid supplies shall also be readily available.			
Has the pilot become familiar with all available information concerning that flight (including, but not limited to airspace requirements, weather forecasts, fuel requirements and other reliable info appropriate to the aircraft, relating to aircraft performance under expected values of elevation and slope, aircraft gross weight, wind, and temperature)?			
Has the operator developed a plan for drone recovery, if needed (e.g., tree recovery, water recovery)?			
Has pedestrian/traffic exposure been evaluated and a mitigation plan developed?			
Has exposure to electrical lines/substations been evaluated and a mitigation plan developed?			
Are employees equipped with proper clothing for the work occurring? <ul style="list-style-type: none"> Consider unique needs for cold-weather, wet-weather, or hunting season 			
Are operators equipped with proper PPE (eye, foot, head, hand, hearing) for the work occurring?			
Will operators be equipped with adequate supplies of fresh water and food?			
If necessary, will operators have a fire extinguisher appropriate for the UAS device?			
Privacy Assurance	Yes	No	N/A
Have considerations been made to ensure that this flight will not infringe on reasonable expectations of privacy? NOTE: Ensure that UAS are not used to monitor or record areas where there is a reasonable expectation of privacy in accordance with accepted social norms, including (but not limited to)			
Are restrooms, locker rooms, individual residential rooms, changing or dressing rooms, and health treatment rooms being viewed?			
Are residential hallways, residential lounges, or the insides of campus daycare facilities being viewed?			
Is there monitoring or recording of sensitive institutional or personal information, which may be found, for example, on an individual's workspaces, on computer or other electronic displays?			
Any other areas governed by existing privacy/trespassing laws.			
Incident Reporting			
NOTE: FAA mandates incident reporting within 10 days of any injuries/\$500 in property damage.			
Flight Point of Contact:	Signature and Date:		

Appendix B – Unmanned Aerial System (Drone) Occupational Safety Guidance

The following document is designed to assist Responsible Departments/UAS operators in evaluating occupational safety considerations involved with UAS operations. This is not intended to be used as a stand-alone document, but as a tool to assist in UAS planning and operations. To ensure that drones are operated in a safe manner, employees must consult and adhere to the requirements of appropriate university policies, Federal Aviation Administration (FAA), and civil aviation legislative requirements. Supervisors or PIs **must** consult with Campus Public Safety and University Risk Management on additional requirements. There are more considerations than what is required within the occupational safety (OSHA) scope.

Purchasing a Proper Unit

Drones which will be used for university activities must meet ASTM design and construction standards for UAS.

If a drone, to include research and development drones, will not meet ASTM design and construction standards, the Responsible Department must coordinate with Risk Management prior to purchase or operation.

Reading your Manual

Special precautions will be explained in the manufacturer's manual. Since all of the risk associated with the operation of a unit doesn't fall under one particular discipline, you must be vigilant in asking your chain of command questions associated with the work.

If you've purchased a loud UAS and believe that the sound it produces to be over 85 decibels (dB), contact SM to request a noise survey. Your manual may also indicate the maximum dB and frequency of the noise produced.

Planning and site considerations

An evaluation of the work must be done prior to deployment to a site, or initiation of a device. If you're going to be headed out to the field, please complete the Field Work Hazard Assessment found on the Safety Management (SM) website. Ensure you talk to SM if you have questions about items found in this document related to occupational safety and health.

What is the purpose of the work that will be done (e.g., video recording, pictures, releasing something, projecting something)? Flights for purposes other than surveying/videography/photography may necessitate further discussions with Risk Management, Safety Management, General Counsel, State or Federal regulators, and campus leadership.

Anticipate what could go wrong. When you lose your drone in a tree, how will you get it back? If it lands in a river, do you plan on retrieving it by boat? You'll need proper training, licenses, and possibly other training/certifications that SM cannot provide.

A two-person minimum is required if you will be operating the drone for remote activities (away from campus), operating at night, or operating a UAS in excess of 50 lbs. A working means of

communication must be available on-site, regardless of how remote. Ensure that you have “check-in” criteria to maintain communication with your supervisor/chain-of-command.

Weather conditions and forecast must be monitored and prepared for, both for flight planning purposes and to ensure safe travel to and from the site.

Are there emergency medical services in close proximity to where you will be working? OSHA has long interpreted the term "near proximity" to mean that emergency care must be available within no more than 3-4 minutes from the workplace. If not, then at least one employee must receive first aid training and, possibly, bloodborne pathogens training. Adequate first aid supplies shall be readily available and not expired.

A “day-of” meeting (also known as a tailgate meeting) for when the project begins will allow personnel to decide if the conditions, protections, and gear are all appropriate for the work.

Taking the Right Gear to the Site

What additional material will you be bringing to the site?

Do you have operational communication devices that are capable of working in remote locations/terrain?

Will you be bringing any hazardous materials such as gasoline or solvent sprays? Do you have SDSs for each one?

Do you have a first aid kit (and all contents within their expiration date)?

Do you have proper PPE (eye, foot, head, hand, hearing) for the work occurring?

Is it winter? Do you have proper cold-weather gear?

Do you have adequate supplies of fresh water and food?

Do you have a non-conductive retrieval tool if the drone gets stuck? Are you prepared to retrieve or abandon?

Is it hunting season? Do you have proper hunter-orange clothing?

Do you have a fire extinguisher capable (by size and type) for extinguishing the device if necessary?

Test Driving and Maintenance

Test your device in a safe and secure (outdoor) location as free of wind/trees other personnel as reasonably possible. Test operations indoor are more likely to result in injury or property damage.

Do not operate your drone for the first time near any kind of power line or electrical substation.

Understand the difference between deep cycle, quick discharge, bulging batteries, and safe charging locations (including proper ventilation of the space, if necessary). Ensure you also understand the

hazards associated with battery charging and hydrogen gas ventilation. If batteries require topping off, you must have an eyewash station within 10 walking seconds and proper Personal Protective Equipment (PPE) available.

Proper personal protective equipment is paramount for testing and operation of the unit.

Do not deviate from manufacturer specifications or original parts, as this could lead to equipment damage/employee injury if parts fail.

While maintaining equipment, follow the manufacturer's specifications on equipment, process and safeguards.

A large enough damaged battery can cause shock or explode on personnel if conditions are right. Don't pry out damaged batteries with conductive tools or puncture cases.

If it Crashes

Don't climb trees to retrieve it.

Don't get into water to retrieve it.

Don't try to get the unit off of power lines or any type of similar utilities.

Report all injuries when they occur.

After Action

Did everything go as planned? Share with your co-workers what worked and what didn't. Let SM know so we can better inform future research and project work.

Contact SM if you feel that additional information would be pertinent to this guide for occupational safety.

If you have additional questions, comments, or concerns, please visit the Safety Management (SM) webpage, sem@maine.edu or call us at 207-581-4055.