REGIONAL DISASTER PREPAREDNESS ORGANIZATION (RDPO)

UAS FLIGHT STANDARDS FOR OPERATIONS

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This document has been written to assist Districts regionally and statewide in developing UAS programs and response operations. These best practices are the result of collaborative efforts between the Near Space Corporation (NSC) and the RDPO / Scappoose District and best in class organizations around the country. It is intended that Districts / Departments adopt and incorporate these best practices into their UAS programs. This will assist in creating common program and response operation standards throughout the region and the state. Due to the nature of UAS technology and program advancements, this is a living document to be updated regularly.

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Signatory Fire Agencies of the RDPO Fire & EMS Workgroup

CLACKAMAS FIRE DISTRICT #1

FIRE & RESCUE

Contents

Section 1: Introduction to Scappoose UAS Best Practices

1.1 Purpose

The vision of the participating departments and agencies is to:

- Create baselines for emerging technologies and standards for integration into existing emergency response
- Establish coordination between private, public, local, and regional stakeholders to bridge the gaps in resource and capability sharing
- Increase situational awareness and aid incident command decisions at emergency scenes.

Philosophy and Mission Statement:

The following procedures are intended to promote safe, efficient, lawful and standardized operation of Scappoose Fire District's (SFD) and the Regional Disaster Preparedness Organization, Public Safety Aviation Program. Safety, above all else, is the primary concern in every operation, regardless of the nature of the mission. Many procedures within this document were adopted from current Federal Aviation Administration (FAA) requirements and industry best practices, the SFD Standards for UAS Operations, and NWCG Inter-agency Fire UAS standards.

Mission Statements:

The mission of the Scappoose Fire District: We are dedicated to the preservation and protection of life and property of our community through education, fire protection, emergency services, and disaster preparedness.

The Mission of the Regional Disaster Preparedness Organization (RDPO): Build and maintain regional disaster preparedness capabilities in the Portland Metropolitan Region through strategic and coordinated planning, training and exercising, and investment in technology and specialized equipment.

UAS Operations:

The RDPO will ensure UAS are used appropriately to further our mission with public safety, privacy and civil rights guarded. We will remain transparent in our UAS utilization. The RDPO will only use UAS when it is the right tool for the job and only when the proper approvals and risk management plans are in place.

When operating UAS, RDPO operators will abide by applicable 14 CFR Parts 91 and 107.

FAA Order 8900.1, Volume 16, Uncrewed Aircraft Systems (UAS) link Provided for reference to Federal Aviation Administration (FAA) policy and regulations.

This document is organized to provide a reference between controlling UAS policy and regulation and operational standards and best practices necessary for conducting safe, successful, efficient operations. UAS pilots, managers and users should familiarize themselves with the entire Scappoose Fire District's Standards for UAS Operations and reference relevant sections for mission – specific planning purposes. The appendences provide standard operational and administrative forms, checklists, and other tools of the trade as well as the current Oregon and Washington State laws on UAS.

Scope:

This document provides guidance for all RDPO Operational control and non-operational control missions, operations and management utilizing UAS.

RDPO UAS Missions conducted under the fire management application will adhere to the National Wildfire Coordinating Group's Interagency Fire UAS Operations Guide (PMS 515) and / or the RDPO Natural Resource Management UAS Program Management Guide as applicable.

14CFR 1.1 defines “aircraft” as a device that is used or intended to be used for flight in the air. UAS are considered aircraft and must comply with applicable regulations, policies and procedures required by FAA. UAS are also defined as an aircraft and include the associated elements (including all communication links and the components that control the uncrewed aircraft) that are required by the FAA

Guiding Entities, Federal Authorities to their agencies:

The guiding documents of this operations manual are the most current and complete best practices based on the discipline and rigor that is needed to operate in the National Airspace System. Understanding the origin of operating UAS in the Emergency Management Sector as another vehicle will make the RDPO more successful when conducting joint operations with the US Forrest Service, State and local Fire Districts. The following documents are the resources that form the foundation of the RDPO Program.

1. The US Forrest Service Manual (FSM) 5713.7,
2. Forrest Service Handbook (FSH) 5709.16 and Chapter 36.7 of the Forrest Service Handbook.
3. The RDPO follows the USDA Departmental Regulation 3465.002 in regards to Privacy and Civil Rights when using UAS in the conduct of its operations.

UAS Operations in the National Airspace System (NAS):

The RDPO group programs and personnel have the authority to conduct UAS operations in the National Airspace System with the following stipulations:

1. When the operation adheres to the requirements, procedures and standards within applicable direction from the RDPO and the provisions of 14 CFR Part 107, waiver requests under Part 107 will be reviewed by the Scappoose UAS Program Manager prior to submittal to FAA.
2. When the operation is conducted under authorizations granted using the FAA’s Low Altitude Authorization and Notification Capability system (LAANC). Waiver requests outside of the LAANC systems shall be reviewed by the Scappoose UAS Program Manager or designee prior to submittal to the FAA.
3. When the operation follows the provisions outlined in the Blanket Certificate of Authorization for operating in class G Airspace.
4. When the operation is conducted under a standalone Certificate of Waiver of Authorization (COA) for a specific mission. COAs will be coordinated with the Scappoose UAS Program Manager.
5. When the operation is conducted utilizing the MOA regarding Beyond Visual Line of Sight Operations (BVLOS) of UAS in support of emergency assistance within an Active Temporary Flight Restriction (TFR) or FAA Certificate of Authority (COA).
6. All UAS operations within a Restricted, Prohibited and Warning areas must be authorized by the controlling authority. RDPO UAS operators (pilots), and managers must comply with any restrictions placed on the operation by the controlling authority.

During operations, uncrewed aircraft can be utilized in circumstances that may save lives and/or property, as well as detect possible dangers to emergency crews that might not otherwise be seen. The increasing availability of low-cost small uncrewed aircraft systems (UAS), together with image processing applications, real-time video, and various sensor payloads, provides an opportunity for Districts / Departments to:

- Collect forensic-quality scene information
- Provide infrastructure inspections and damage assessments
- Speed up incident clearance
- Assist in search and rescue
- Improve fire observation
- Reduce the exposure of law enforcement officers, emergency responders, and the public to hazardous conditions

This document establishes standard guidelines for the use of uncrewed aircraft by the District / Department, and for the collection, retention, and dissemination of images, video, and data captured by the uncrewed aircraft.

Note: For the purposes of this document, "UAS" encompasses all uncrewed aircraft systems operated by the participating departments or agencies.

1.2 Scope

Uncrewed aircraft can be used in many ways in emergency management, firefighting, law enforcement, and search and rescue. Some of the typical missions for which they may be deployed are:

- Operational situational awareness through real-time video transmission, video recording, and aerial photography
- Perimeter and acreage calculation
- Incident perimeter maps (point, line, polygon data)
- Infrared inspection and mapping
- Digital orthophotos (fire, HAZMAT, disaster area points of origin, structure triage, damage assessment)
- 3D models (terrain/infrastructure)
- Wildfires
- Fire observation and damage assessment
- During training activities
- Search and rescue
- Accident scenes
- Hazardous materials scenes
- Infrastructure Inspections
- Flood events / storm damage assessment
- Tactical situations
- Investigations
- Pre-fire planning
- Major disaster scenes
- Crime scenes
- Anytime an aerial view of an emergency scene is appropriate

Districts / Departments may also respond to other requests for UAS service to preserve the health, safety, and welfare of people or property.

All missions shall be flown in accordance with 14 CFR Parts 61, 91, and 107, as applicable.

1.3 Privacy

In light of the diverse potential UAS uses in the National Airspace System (NAS), expected advancements in UAS technologies, and the anticipated increased uncrewed aircraft use in the future, Districts / Departments shall make reasonable efforts to ensure that UAS privacy policies (Scappoose Fire Policy 534) are periodically updated to keep pace with these developments.

All UAS flights shall be compliant with the Oregon State laws and guidelines regarding public aircraft flying in the NAS.

Note: For more information, see Appendix H – Oregon / Washington Laws on UAS

A District / Department shall not intentionally use uncrewed aircraft for the purpose of viewing, recording, or transmitting images and/or video in a criminal investigation or prosecution at any location or upon any property at which a person has a reasonable expectation of privacy unless one or more of the following is true:

- A warrant or court order has been approved for the search of the property
- A right-of-way has previously been established
- Consent by the owner or person responsible for the property is obtained
- Exigent circumstances exist, to include emergency response, active fire/search and rescue operations, and so on.
- The deployment of uncrewed aircraft due to exigency shall be authorized by the District / Department UAS Coordinator (or designee), or other governmental agency making the request for the uncrewed aircraft service, and the factual basis for such exigency shall be documented.

1.4 Transparency

To promote transparency about uncrewed aircraft activities, the department shall, while not revealing information that could reasonably be expected to compromise privacy, the public safety, or the safety of member agency personnel, or that may not be released pursuant to the Oregon Law on UAS Flights or other Applicable Law:

- Provide reasonable notice to the public regarding areas all District / Department uncrewed aircraft are authorized to operate in the NAS.
- Make a reasonable effort to inform the public about the District / Department UAS program, as well as changes expected to materially affect privacy, civil rights, or civil liberties.
- Provide upon request, a general summary of the District / Department's uncrewed aircraft operations during the previous calendar year, to include a brief description of types or categories of missions flown, and the number of times the Districts / Departments team members provided aircraft services.
- TRANSPARENCY OF UAS OPERATIONS:

  The district will make this policy available to the public. This policy will be posted on the public facing aviation website. With the District's COA, the Fire District has the ability to operate in Class C, D, E and G airspace, Tactical Beyond Visual Line of Sight (TBVLOS), and up to 1,199 feet Above Ground Level (AGL) in Clark County Washington and the entire State of Oregon. When feasible, the RPIC will file a NOTAM under the prescriptions outlined in the COA. The Fire District will report monthly to the FAA, all flights flown under the COA (As required and outlined in the COA Document) and will provide a year-end summary to the Oregon Department of Aviation and post on our website. This report will include categories of missions flown, mutual aid and complaints about the program.
- SHARING DATA WITH OTHER ORIGINAZATIONS / JURISDICTIONS:

  Any information collected during an incident or special request from another entity shall be made available to that entity as long as that information is not subject to PII. Information collected that may contain PII, shall not be retained for more than 180 days, unless retention of the information is determined to be necessary to an authorized mission of the retaining agency. Additionally, the information retained bust be done using a system of records covered by the Privacy Act. Information that is part of an ongoing investigation shall not be shared or released unless it is specific to the investigation activities and the outside agency(s) requesting the data. Members of the public or media seeking to obtain information obtained with a UAS that is part of an investigation, must obtain a court order before the district will release such information and conform to all applicable laws, regulations and policies.

Note: For more information, see Section 8.9 Operational Transparency. Scappoose UAS Policy

Section 2: Acronyms and Definitions

2.1 Acronyms

AGL	Above Ground Level
ATC	Air Traffic Control
SRFD	Authority Having District / Department
BVLOS	Beyond Visual Line of Sight
CFR	Code of Federal Regulations
COA	Certificate of Authorization
CRM	Crew Resource Management
CS	Control Station
FAA	Federal Aviation Administration
FPV	First Person View
FRAT	Flight Risk Assessment Tool
GPS	Global Positioning System
ILA	Inter-Local Agreement
LZ	Landing Zone
MSL	Mean Sea Level
NAS	National Airspace System
NOTAM	Notice to Airmen
NTSB	National Transportation Safety Board
OPAREA	Operational Area
PAC	Pilot at Controls
PIC	Pilot in Command
SRFD	Public Safety Uncrewed Response Team
RPIC	Remote Pilot in Command
SGI	Special Government Interest
TFR	Temporary Flight Restrictions
TRACON	Terminal Radar Approach Control Facility
SOSC	(FAA) System Operations Support Center
sUAS	Small Uncrewed Aircraft System
UAS	Uncrewed Aerial System
VFR	Visual Flight Rules
VLOS	Visual Line of Sight
VO	Visual Observer

2.2 Definitions

In addition to the acronyms defined in Section 2.1, and the terms defined elsewhere in this guide, the following definitions shall apply:

Altitude	The height measured above an object such as above the underlying ground surface (AGL).
Authority Having District / Department	An organization, office, or individual responsible for enforcing the requirements of a code or standard, or for approving equipment, materials, or a procedure.
Air Boss	Also may be UAS Team Leader. This position is activated when three (3) or more UAS are involved in an operation. Or, when UAS and crewed aircraft are working together with no Air Operations Section Chief.

Certificate of Authorization (COA)	An authorization issued by the Air Traffic Organization of the Federal Aviation Administration to a public operator for a specific uncrewed aircraft activity.
Civil Twilight	The time periods between approximately 30 minutes before sunrise until sunrise, and between sunset and approximately 30 minutes after sunset.
Controlled Airspace	A generic term that covers the different classifications of airspace (Class A, B, C, D and E airspace) and defined dimensions within which ATC services is provided.
Corrective Lenses	Spectacles or contact lenses.
Crew Leader	Any person representing a UAS group from a participating agency in the regional UAS program.
Crew Resource Management (CRM)	A process designed to aid in the prevention of aviation accidents and incidents by improving performance through an understanding of human factor concepts, which focuses on interpersonal communication, leadership, and decision making by the flight crew.
Critical Data	Data that may be related to an investigation, involves a fatality, is part of critical government infrastructure, is related to an imminent threat to public safety, and/or has a potential terrorism or criminal nexus.
Data Specialist	A person who works with the RPIC to generate data required for strategic level planning, assessment, or decision-making.
Defined Incident Perimeter (DIP)	A defined perimeter to be determined based on the scope of the operation and applicable FAA requirements.
Digital Electronic Management System (DEMS)	A content management system (CMS) that centrally stores and manages all digital files. It allows an organization to control and centralize management of digital content or data.
Digital Image	A numeric representation (normally binary) of a two-dimensional image. Depending on whether the image resolution is fixed, it may be of vector or raster type. By itself, the term “digital image” usually refers to raster images or bitmapped images.
External Hard Drive	A portable storage device that can be attached to a computer through a USB or FireWire connection, or wirelessly. The devices typically have high storage capacities and are often used to back up computers or serve as a network drive.
First Person View (FPV)	A method used to control a radio-controlled aircraft from the RPIC’s viewpoint via an onboard camera, fed wirelessly to video goggles or a video monitor.
Geographical Area of Operation	Either a physical description of a location or using GPS coordinates.
Hard Drive	A high-capacity, self-contained storage device containing a read-write mechanism plus one or more hard disks, inside a sealed unit.
Horizontal Distance	The physical measurement between two objects.
Incident Commander	The person who has overall responsibility for managing the incident by establishing objectives, planning strategies, and implementing tactics. The

	Incident Commander is the only position that is always staffed in ICS applications.
District / Department	A range or sphere of authority. Public agencies have District / Department at an incident related to their legal responsibilities and authority. District / Departmental authority at an incident can be political or geographical (for example, city, county, tribal, State, or Federal boundary lines) or functional (for example, law enforcement and public health).
District / Departmental Agency	The agency having District / Department and responsibility for a specific geographical area or a mandated function.
Landing Zone (LZ) Manager	The person who oversees the landing zone, coordinates altitude separation between aircraft, and manages air traffic landing and takeoff operations. This position may also be referred to as the Pilot in Command (PIC) of the operation. When this occurs, the person at the controls is referred to as the Pilot at Controls (PAC).
Memory Card	(Sometimes called a *flash memory card* or a *storage card*) A small storage medium used to store data such as text, pictures, audio, and video for use on small, portable, or remote computing devices.
Night	The time between the end of evening civil twilight and the beginning of morning civil twilight, as published in the American Air Almanac, converted to local time.
Non-Critical Data	Information gathered during the mission that is not deemed part of an investigation and does not involve a fatality.
Nonparticipant	Any person not associated with the UAS flight mission, including the public, spectators, and media.
Person Manipulating the Controls	A person other than the RPIC who is controlling the flight of a UAS under the supervision of the RPIC.
Remote Pilot in Command (RPIC)	The department member who has final authority and responsibility for the operation and safety of the flight, has been designated as RPIC before or during the flight, and holds the appropriate category, class, and type rating, if appropriate, to conduct the flight.
UAS	Uncrewed Aircraft System and all associated support equipment, control station, data links, telemetry, communications, navigation equipment and so on, necessary to operate the uncrewed aircraft. For the purposes of this document, “UAS” encompasses all uncrewed aircraft systems operated by the participating departments or agencies.
UAS Manager	The conduit between a UAS vendor (under federal contract/agreement) and an Incident Management Team (IMT).
UAS Team Leader	Represents the agency and is responsible for the administrative and supervisory functions related to the agency or department UAS equipment and crew while on scene at an incident.

Uncrewed Aerial System (UAS)	Uncrewed aerial system and all associated support equipment, control station, data links, telemetry, communications, navigation equipment and so on, necessary to operate the uncrewed aircraft. For the purposes of this document, “UAS” encompasses all uncrewed aircraft systems operated by the participating departments or agencies.
Small Uncrewed Aerial System (sUAS)	An uncrewed aircraft weighing less than 55 pounds, including everything that is onboard or otherwise attached to the aircraft, and its associated elements (including communication links and the components that control the small UA) that are required for the safe and efficient operation of the small UAS in the NAS. For the purposes of this document, “UAS” encompasses all uncrewed aerial systems operated by the participating departments or agencies.
Vision Aides	Binoculars, night vision devices and so on, used only for augmentation of visual observation duties. Any electronic, electro optical system that will aid the human eye in identifying objects in the air and on the ground.
Visual Flight Rules (VFR)	A set of regulations under which a RPIC operates an aircraft in weather conditions generally clear enough to allow the RPIC to see where the aircraft is going and any other aircraft in the vicinity. For UAS Team purposes, VFR requires a 3-statute mile visibility with operations conducted at least 500 feet below any clouds.
Visual Line of Sight (VLOS)	At all times the UAS shall remain close enough to the RPIC and the person manipulating the flight controls, or a Visual Observer, for those people to be capable of seeing the aircraft with vision unaided by any device other than corrective lenses.
Visual Observer (VO)	A person acting as a flight crew member who assists the RPIC to see and avoid other air traffic or objects aloft or on the ground.

Section 3: Team Organization

3.1 Overview

In order to maintain the span of control for any operation within the Incident Command System, it is important to have a scalable system that allows for the delegation of authority. This allows for a safer and smoother operation. The complexity of the data product and UAS operation drives the personnel requirement.

> **Note:** For more information, see Appendix G: Example of UAS Modules and Packages (ICS Structure).

A UAS flight crew may include, but is not limited to, the following positions:

UAS Manager	The conduit between a UAS vendor (under federal contract, cooperator, and/or agreement) and an Incident Management Team (IMT)
UAS Team Leader	Represents the agency and is responsible for the administrative and supervisory functions related to the agency or department UAS equipment and crew while on scene at an incident. This position may also be referred to as an Air Boss.
LZ Manager	Oversees the landing zone, coordinates altitude separation between aircraft, and manages air traffic landing and takeoff operations. This position may also be referred to as the Pilot in Command (PIC) of the operation. When this occurs, the person at the controls is referred to as the Pilot at Controls (PAC).
RPIC	The department member who has final authority and responsibility for the operation and safety of the flight, has been designated as RPIC before or during the flight, and holds the appropriate category, class, and type rating, if appropriate, to conduct the flight.
Visual Observer	Assists the RPIC and the person manipulating the flight controls to locate and avoid other air traffic or objects aloft or on the ground.
Data Specialist	Works with the RPIC to generate data required for strategic level planning, assessment, or decision-making.
Other Crew Members	Members who assist in the safe operation and maintenance of the UAS services.

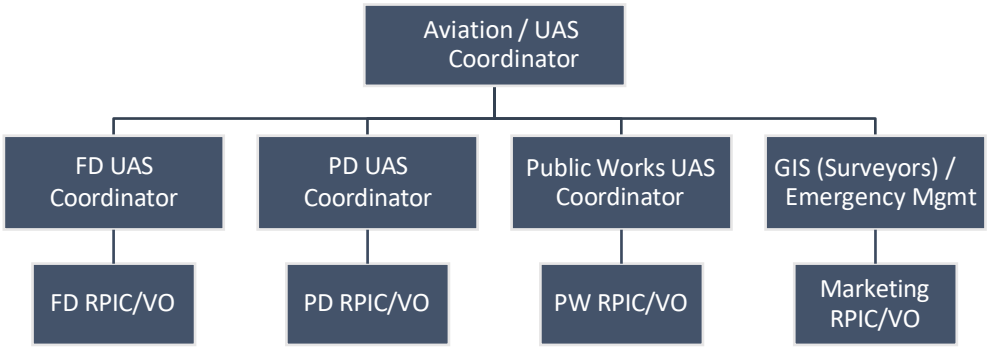
Each District / Department is responsible for the selection and training of its crew members; However, they must be certified and carded and undergo the RDPO's training course to utilize the state wide COA. Flight crews may be requested for mutual aid missions by other governmental agencies.

3.2 SRFD Aviation / UAS Coordinator

The SRFD Aviation / UAS Coordinator oversees all uncrewed aircraft public safety program operations for the District / Department. They may also coordinate training for commercial uncrewed aircraft operations within other departments.

> **Note:** For more information about administering the program, see Section 16: Administering the SRFD Program at the RDPO COA USERS Level.

District / Department UAS Management Chart



The UAS Coordinator responsibilities include, but are not limited to, the following:

- Ensure flight crews are compliant with all FAA requirements
- Maintain a current list of certified crew members
- Establish and develop departmental UAS Coordinators within the District / Department
- Monitor and record the condition, maintenance, and flight records of all UA systems and associated equipment
- Perform monthly FAA reports and record management duties
- Maintain and update the Public Safety COA
- Ensure monthly flight skills and classroom training is completed by all RPIC in all departments

3.3 UAS Manager

The UAS Manager is the conduit between a UAS vendor (under contract / cooperator and/or agreement) and an Incident Management Team (IMT).

This position is activated when contract UAS services are requested for an incident.

3.4 UAS Team Leader

The UAS Team Leader (or designee) represents the agency and is responsible for the administrative and supervisory functions related to the agency or department UAS equipment and crew while on scene at an incident.

> **Note:** This position may also be referred to as the Air Boss.

The UAS Team Leader maintains an appropriate span of control for the team and provides a single point of contact for UAS operations/data processing to incident leadership in the field. A typical UAS team consists of at least one RPIC, one visual observer, one UAS Team Leader, and possibly a data specialist or LZ Manager.

The UAS Team Leader's tactical responsibilities may include, but are not limited to, the following:

- Locate with Field Command to act as a liaison for the UAS Crews
- Receive mission assignments and forward those assignments to the RPIC's or LZ Manager in the field.
- Contact the District / Department Coordinator for additional UAS resources.

- When an LZ Manager is not on scene, manage takeoff / landing zones anytime there are three or more aircraft operating in the same airspace. In this case, the UAS Team Leader locates with the flight crew; not at Field Command.
- Manage airspace separation assurance standards between aircraft, to include both manned and uncrewed operations.

Note: For a Flight Team Leader Checklist, see Appendix B: Flight Team Leader (Air Boss) Checklist Example.

3.5 Landing Zone (LZ) Manager

The LZ Manager is a required position anytime there are three or more aircraft flying from the same landing/takeoff zone. The LZ Manager oversees the landing zone, coordinates altitude separation between aircraft, and manages air traffic landing and takeoff operations. The LZ Manager receives mission assignments and assigns those missions to the appropriate RPIC's.

This position may sometimes be referred to as the Pilot in Command (PIC) of the operation.

3.6 Remote Pilot in Command (RPIC)

The RPIC is the department member who has final authority and responsibility for the operation and safety of the flight, has been designated as RPIC before or during the flight, and holds the appropriate category, class, and type rating, if appropriate, to conduct the flight.

The RPIC supports operations by providing real-time situational awareness in the form of electro-optical (daylight) or infrared video/still images. The RPIC is also trained to collect imagery and telemetry which can be processed into precise planning documents such as geo-referenced maps, orthomosaic photos, digital elevation models, or 3D terrain models.

The responsibility and authority of a RPIC is described in 14 CFR § 91.3

The RPIC may rotate duties as necessary with equally qualified RPIC's and the agency member designated as RPIC may change during flight, as long as there is always one designated RPIC.

This person may also be referred to as the Pilot at Controls (PAC).

Note: For more information about the RPIC training and certification process, see Section 15: Training and Certification Process.

3.7 Visual Observer (VO)

The Visual Observer assists the RPIC and the person manipulating the flight controls to locate and avoid other air traffic or objects aloft or on the ground.

Note: For more information about the Visual Observer training and certification process, see Section 15: Training and Certification Process.

3.8 UAS Data Specialist

The UAS Data Specialist works as a team member with the RPIC to generate data required for strategic level planning, assessment, or decision-making. They may also work with the Geographic Information System Specialist (GISS) or Infrared Interpreter (IRIN) to generate required products.

The UAS Data Specialist specializes in the following:

- Performs preflight and post-flight safety and security checks of onboard data gathering and streaming equipment.
- Ensures that data recording and streaming equipment is operational preflight, during flight, and post-flight to achieve the mission objectives.
- Maintains the flow of streamed data to the receiver while the aircraft is in flight.
- Ensures that backup recording devices are operational before launch.
- Converts video, still, or telemetry data into either a pre-processed dataset or precision product such as geo-referenced maps, orthophotos, digital elevation models, or 3D terrain models.
- Checks recorded data, creates a backup copy, and forwards original to designated operations and planning authorities.
- Documents the chain of custody for information gathered from the aircraft.

On Regional UAS teams, each participating agency shall designate one crew member as the UAS Data Specialist. This position is responsible for maintaining any records or data obtained during UAS operations including UAS flight records, for directing third party requests for open records concerning a member agency to that agency, and for performing other similar duties as appropriate or needed.

If the mission relates to situational awareness, small scale acre/perimeter calculation, or aerial photos/video, a Data Specialist is not required.

Note: For more information about collection, retention, and dissemination of information, see Section 13: Data Management Best Practices.

3.9 Other Crew Members

Other crew members include any other agency or department members who assist in the safe operation of the UAS services, including operating payloads.

Section 4: Flight Crew Qualifications

4.1 Carding Pilot

All carding pilots will be familiar with the various aircraft that they are providing check rides for. Carding pilots are pilots who have been given authority by the RDPO UAS Coordinator to evaluate other pilots and aircraft.

4.2 RPIC Qualifications

All RPIC's flying SRFD / RDPO missions shall be properly trained by either manufacturer representatives or instructors as designated by the district to have the ability to utilize the statewide COA.

RPIC's shall meet all conditions of the FAA Part 107 certificate and/or COA and shall have a current working knowledge of the airspace intended for operations, LAANC, specific UAS aerodynamic factors, and the ability to obtain and interpret weather.

All RPIC's shall keep their flight logs current.

The minimum training and certification requirements for a RPIC are as follows:

- **Basic Flight Operations Training** – RPIC's shall successfully complete and pass basic flight operations training as approved by the RDPO UAS Manager.
- **Part 107** – RPIC's shall obtain and keep current their FAA Part 107 Remote Pilot certificate. RPIC's shall have their certificate with them anytime they fly a mission.
- **Mission Training** – RPIC's shall undergo mission training to increase specific core competencies in all UAS operations, systems, and roles. This training is in addition to Basic Flight Operations Training.
- **Driver's License** – RPIC's shall have a valid driver's license.

4.3 Proficiency

It is recommended that a RPIC complete a minimum of 30 minutes flight training every month in order to maintain proficiency. Recurrent training includes hands on pilot/observer skills as well as knowledge of all pertinent UAS and aviation matters.

All members within the UAS flight crew operating under a COA shall read the current COA and maintain proficiency in their operator/observer abilities.

At a minimum, the RPIC shall attend two UAS trainings and conduct three takeoffs (launch) and three landings (recovery) with the specific UAS aircraft type within the previous 90 days prior to flying an operational mission. Members who do not have documented training or flight time for the preceding 90 days may be required to demonstrate proficiency before performing pilot/observer duties during a mission.

The RPIC shall pass an aeronautical knowledge test every 24 months.

Failure to maintain/prove proficiency may result in removal from UAS operations.

4.4 VO Qualifications

The minimum training and certification requirements for a VO are as follows:

- **Training** - Completion of a training course for the safe flight of aircraft, including the responsibilities described in 14 CFR Part 91 §91.111, §91.113 and §91.115, regarding cloud clearance, flight visibility, and the pilot controller glossary including standard ATC phraseology and communication.
- Scappoose Fire / RDPO Visual Observer training program
- **Driver's License** – VOs shall have a valid driver's license.

4.5 Crew Resource Management

The Aviation Manager shall confirm that CRM training is current for all participating crew members before flying operational or training missions.

The CRM training consists of initial training as well as CRM recurrent training during every recurrent training cycle, not to exceed a 12-month interval between initial training and recurrent training or between subsequent recurrent training sessions.

4.6 Restrictions

No person may serve as a RPIC, person manipulating the controls, VO, or other crew member if any of the following are true:

- They consumed any alcoholic beverage within the preceding eight hours.
- They are under the influence of alcohol.
- They have a blood alcohol concentration of 0.04 percent or greater.
- They are using a drug, whether prescription, over-the-counter, recreational, or illegal, that affects their ability to safely operate the aircraft and/or participate in the UAS operational mission.

It is the responsibility of the RPIC, person manipulating the controls, VO, or other crew member to determine whether they are unable to participate in a UAS operation. However, the Crew Leader and/or Incident Commander of the incident for which UAS services are provided, may require the RPIC, person manipulating the controls, VO, or other crew member to cease participation in a UAS operation for any reason.

No RPIC or VO may participate in UAS activities that exceed 16 continuous operation hours in a 24-hour period.

Section 5: Aircraft Airworthiness and Maintenance

5.1 Airworthiness Certification

The Aviation Manager of each participating district is responsible for determining that the aircraft used by its RPIC's are airworthy.

All aircraft shall be operated in strict compliance with all provisions and conditions contained in the Airworthiness Safety Release, including all documents and provisions referenced in any applicable COA applications or Part 107 waivers. Only COA approved aircraft can be flown under the COA. If other aircraft needs to be added, a request to the Aviation Coordinator at SRFD will be necessary.

5.2 Maintenance

Each Agency will be responsible for maintenance in accordance with manufacturers recommendations and inspection timelines. The SRFD is responsible for the maintenance data of all uncrewed aircraft in the 'Drone Sense' platform.

UAS maintenance includes scheduled and unscheduled overhaul, repair, inspection, modification, replacement, and system software upgrades of the aircraft and its components necessary for flight.

5.3 Configuration Control

A configuration control program shall be in place for hardware and/or software changes made to the UAS to ensure continued airworthiness.

Software changes to the aircraft and control station as well as hardware system changes are classified as major changes documented as part of the normal maintenance procedures.

Each aircraft that has a major change in software or hardware configuration shall be test flown on a test range to confirm the airworthiness of the aircraft.

5.4 Preflight Inspection

Before each flight, the RPIC shall inspect the aircraft to ensure that it is in a condition for safe operation, such as inspecting for equipment damage or malfunctions. The preflight inspection shall include a visual or functional check.

> **Note:** For a detailed preflight inspection checklist, see Appendix A: Flight Checklist Example.

5.5 Maintenance Records

Member agencies or Districts / Departments shall keep documentation of any maintenance, repair, modification, overhaul, or replacement of a system component for each UAS. This includes recording time-in-service for components (for example, airframe, batteries, and so on).

Maintenance records shall be retrievable from either hard copy and/or electronic logbook format for future reference. Maintenance reports from the UAS Managers of user districts / departments shall be sent to the RDPO UAS Manager every six months for record keeping.

Records shall be kept for the following items:

- Flights per aircraft / Hours per aircraft
- Charge cycles per battery / Flight hours for each battery / Total Flights
- Flights and flight hours per propellers

5.6 Required Maintenance

Member agencies or Districts / Departments shall perform maintenance on the following items. This shall be completed according to manufacturer specification.

In the interest of safety, all disposable items (batteries and propellers) shall be taken out of service and replaced using a 25% safety buffer. If a battery is identified as having a life of 200 charges, the battery shall be removed after 150 charges. Propellers shall be replaced every year, every 100 hours or 200 flights, whichever comes first.

Batteries -

Batteries shall have two maintenance cycles. **Basic** and **Full.**

Basic: Basic maintenance is based upon either one of the following, 20 charges, 20 flights or 200 minutes flown.

- Fly until the battery level reaches 25%-30%
- Allow battery to cool to room temperature
- Put battery back in the aircraft and turn the aircraft on and allow the battery to discharge down to 8%.
- Allow the battery to cool to room temperature
- Recharge battery normally
- Check battery casing for any swelling, damage or other defects

Full: Full Maintenance is based upon either one of the following, 100 charges, 160 flights or 1,600 minutes flown.

- Look to see if there is any damage, deformities or swelling of the outer shell
- Look for any cracks in the outer enclosure
- Verify that the batter grip (Latches) work properly and return to position
- Check all gold plates on the battery
- Fly until the battery level reaches 25%-30%
- Allow battery to cool to room temperature
- Put battery back in the aircraft and turn the aircraft on and allow the battery to discharge down to 8%.
- Allow the battery to cool to room temperature
- Recharge battery normally

Aircraft-

Aircraft shall have three maintenance cycles. **Basic**, **Extended** and **Full.**

Basic: Basic maintenance is based upon either one of the following, 20 flights or 200 minutes flown.

- Look for cracks in the outer shell
- Check that all screws are in place and tight
- Inspect propellers and look for broken pieces, bent blades or other damage

Extended: Extended maintenance is based upon either one of the following, 100 flights or 1,000 minutes flown.

- Complete all elements of the basic service
- Perform IMU calibration
- Perform Compass calibration
- perform gimbal calibration

Full: Full maintenance is based upon either one of the following, 200 flights or 2,000 minutes flown.

- Complete all elements of the Basic service
- Complete all elements of the Extended service
- Check that all screws are in place
- Inspect stickers on the aircraft and make sure none are loose
- Verify aircraft registration
- Make sure propellers and motors move freely(check all)
- Remove props, turn on aircraft and start motors. Check for unusual vibration or wobbles
- Verify all vents are clean
- Clean all sensors
- Check gimbal absorbers. Make sure they are not cracked or stiff
- Confirm gimbal is locked in place
- Inspect lens for damage
- Inspect gimbal arm and wires for damage

5.7 Payload Restrictions

Any payload attached to the aircraft shall not adversely affect the flight characteristics or controllability of the aircraft.

No aircraft may carry hazardous materials or weapons.

5.8 Storage

The Agencies shall store the aircraft in a controlled environment in accordance with manufacturer recommendations.

Section 6: Aircraft Typing

6.1 Physical Characteristics

Uncrewed aircraft are built in a multitude of configurations which makes classification difficult. For the purpose of emergency response, the classification below applies. Note that certain aircraft are specialized and do not fit this classification.

Contracted aircraft sensors are determined by the contract specifications PMS-515 / UAS Typing &Callsigns

6.1.1 Fixed Wing

Type	Endurance	Data Collection Altitude (AGL)	Max Range (NM)	Typical Sensors
1	6-14 hrs.	3,500 – 8,000’	50	EO/IR/Multi-Spectral, Lidar / Mid Wave IR
2	1-6 hrs.	3,500 – 6,000’	25	EO/IR/Multi-Spectral, Lidar / Long Wave
3	20-60 min	2,500 – 1,200’	5	EO/IR Video and Stills
4	Up to 30 min	400 – 1,200’	5	EO/IR Video and stills

6.1.2 Rotorcraft

Type	Endurance	Data Collection Altitude (AGL)	Max Range (NM)	Typical Sensors
1	NA	NA	NA	NA
2	NA	NA	NA	NA
3	20-60 min	2,000 and below	5	EO/IR Video and Stills
4	up to 20 min	1,200 and below	<2	EO/IR Video and stills

6.2 Operational Characteristics

6.2.1 Type 1 and 2

- These aircraft are generally operated by contractors and provide strategic situational awareness (SA) and incident mapping
- Fixed wing aircraft typically operate above all other incident aircraft
- Communications are maintained with the UAS crew on the assigned Victor (AM) or air to ground (FM) frequencies
- Contract fixed wing aircraft shall be equipped with Mode C transponders
- Typical aircraft are the Scan Eagle, Aerosonde, or MLB Superbat
- Typical rotorcraft includes, but are not limited to, the DJI M600

6.2.2 Type 3 and 4

- These aircraft are generally agency operated and perform tactical SA or mapping missions
- The aircraft are carried and flown on the emergency scene at relatively low levels (+/- 200' AGL)
- Communications are maintained with the UAS crew on the assigned air-to-ground (FM) frequency with the UAS Operator.
- Most do not carry transponders or AFF equipment
- Typical aircraft include, but are not limited to, DJI Mavic, DJI Inspire series, DJI Phantom series, and the DJI M100, M200, M210, 3DR Solo (RW) and FireFly6 (FW).

6.2.3 Sensor Payloads

Sensor payloads are variable but typically include daylight (electro-optical), thermal, or mapping cameras. Type 1 and 2 aircraft may carry multiple camera types in a gimbaled configuration.

Section 7: Airspace Authority

7.1 Authority Identification

As governmental entities, member agencies may choose to operate under the Small UAS Rule, 14 CFR Part 107 ("Part 107"), or conduct public aircraft operations under a blanket or District / Departmental COA.

The RPIC determines the appropriate airspace authority for each flight operation based on the type of airspace, time of day, and any other pertinent circumstances.

The RPIC, VO, and crew members follow the rules of the chosen airspace authority, including any approved waivers, for each operation.

The RPIC shall declare whether they are flying under Part 107 or COA prior to beginning the flight.

7.2 Controlled Airspace

Operations in Class B, Class C, or Class D airspace, or within the lateral boundaries of the surface Class E airspace designated for an airport, are not allowed unless prior authorization is received from LAANC or FAA System Operations Support Center (SOSC), i.e.: FAA approach Control at PDX (P-88)

FAA System Operations Support Center (SOSC)

Contact number: 202.267.8276

Email Address: 9-ATOR-HQ-SOSC@faa.gov

When operating in controlled airspace, the RPIC shall be aware of all traffic patterns and approach corridors to runways and landing areas.

The RPIC shall avoid operating anywhere that the presence of the UAS may interfere with the operations at the airport, such as approach corridors, taxiways, runways, or helipads

The RPIC shall yield right-of-way to all other aircraft, including aircraft operating on the surface of the airport.

7.3 Uncontrolled Airspace

Operations in uncontrolled (Class G) airspace may be conducted without permission.

Section 8: UAS Operations

8.1 Prior to Flight

The RPIC shall assess the operating environment. The safety risk assessment shall include the following:

- Local weather conditions
- Local airspace and any flight restrictions
- The location of persons and property on the surface
- Other ground hazards
- FRAT – Derived from the A-450 platform
- JARUS / SORA

Note: For information about how wind speed relates to observed conditions, see Appendix C: Beaufort Wind Scale. For more information about airspace, see Section 7: Airspace Authority.

The RPIC shall conduct a pre-takeoff briefing as applicable prior to each launch. The briefing shall include, but is not limited to:

- The contents of any applicable COA or Part 107 waiver
- Altitudes to be flown
- Mission overview including handoff procedures
- Frequencies to be used
- Flight time, including reserve fuel requirements
- Contingency procedures to include lost link, divert, and flight termination
- Emergency procedures
- Roles and responsibilities of each person involved in the operation
- Hazards unique to the flight being flown
- Contacting local air ambulances to advise of UAS flight operations

Note: For a detailed preflight inspection checklist, see Appendix A: Flight Checklist Example.

The RPIC shall ensure all necessary documentation is available for inspection, including their Part 107 Remote Pilot certificate, aircraft registration (if required), and COA (if applicable).

8.2 Safety of Flight

- All RPIC's are responsible for halting or canceling UAS activity if, at any time, the safety of persons or property on the ground or in the air may be jeopardized.
- Any VO responsible for performing see-and-avoid requirements for the UAS shall have and maintain effective communications with the RPIC.
- The use of multiple successive VOs (daisy chaining) is allowed as long as all VO's have effective communication with the person manipulating the controls.

8.3 Critical Flight Phases

Critical phases of flight include all ground operations involving:

- Taxi (Take-off and landing (launch or recovery))
- All other flight operations in which safety or mission accomplishment might be compromised by distractions

If any distractions occur during critical phases of the flight operation, the flight shall be aborted until the distractions can be appropriately mitigated.

During a critical phase of flight, crew members may only perform duties required for the safe operation of the aircraft.

No crew member may engage in, nor may any RPIC permit, any activity during a critical phase of flight which distracts any crew members from the performance of their duties, or interferes in any way with the proper conduct of those duties.

The person at the controls and/or the RPIC shall not engage in any activity not directly related to the operation of the aircraft.

The use of cell phones or other electronic devices by crew members is restricted to communications pertinent to the operational control of the UAS.

8.4 Night Operations

VO's shall be positioned in appropriate locations during all UAS flight operations within 3 NM of each other.

Vision aides may not be used as the primary means for visual observation duties; however, they are permitted to augment the VO's visual capability.

All aircraft flown during civil twilight or at night shall be equipped with light emitting diode (LED) position lights installed to comply with 14 CFR §91.209 unless otherwise approved by an FAA waiver.

8.5 Operational Limitations

- The UAS shall remain within VLOS of the RPIC and the person manipulating the controls. Alternatively, the UAS shall remain within VLOS of the Visual Observer.
- At all times, the UAS shall remain close enough to the RPIC and the person manipulating the controls, or the Visual Observer, for those people to be capable of seeing the aircraft with vision unaided by any device other than corrective lenses.
- Unless otherwise authorized as an FAA waiver, all operations shall be conducted in visual meteorological conditions (VMC) following visual flight rules (VFR) weather minimums.
- UAS may not operate over any person not directly participating (nonparticipants) in the operation.
- VO's shall be used at all times during nighttime operations.
- First Person View (FPV) cameras cannot satisfy the "see-and-avoid" requirement; however, they can be used as long as the requirement is satisfied in other ways.
- Operations may occur up to a maximum altitude of 400 feet AGL or, if higher than 400 AGL, remain within 400 feet of a structure unless otherwise approved by waiver.
- No person may act as a RPIC or VO for more than one UAS operation at one time.

8.6 Point of Interest (POI) or Target Designation

Locations of POI or targets shall be communicated using geographic areas of operation or GPS coordinates. GPS format is degrees and decimal minutes (DDM), **DDD° MM.MMM'**.

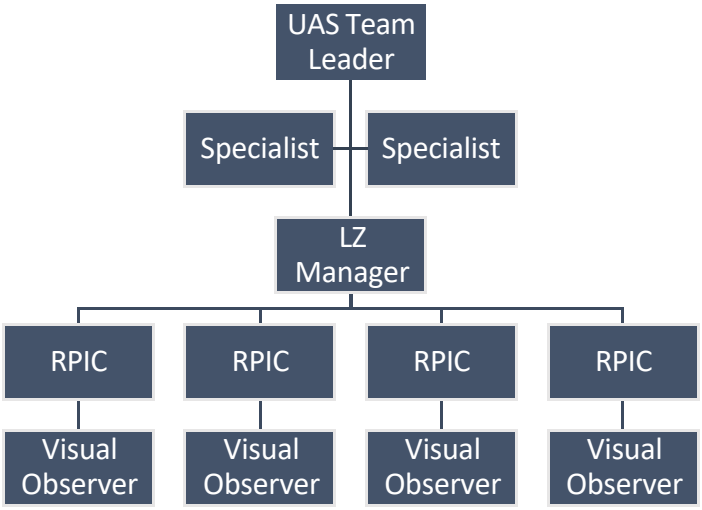
For example: 32° 18.385' N 122° 36.875' W.

Prior to the mission, confirm that all personnel are using the same or a compatible format.

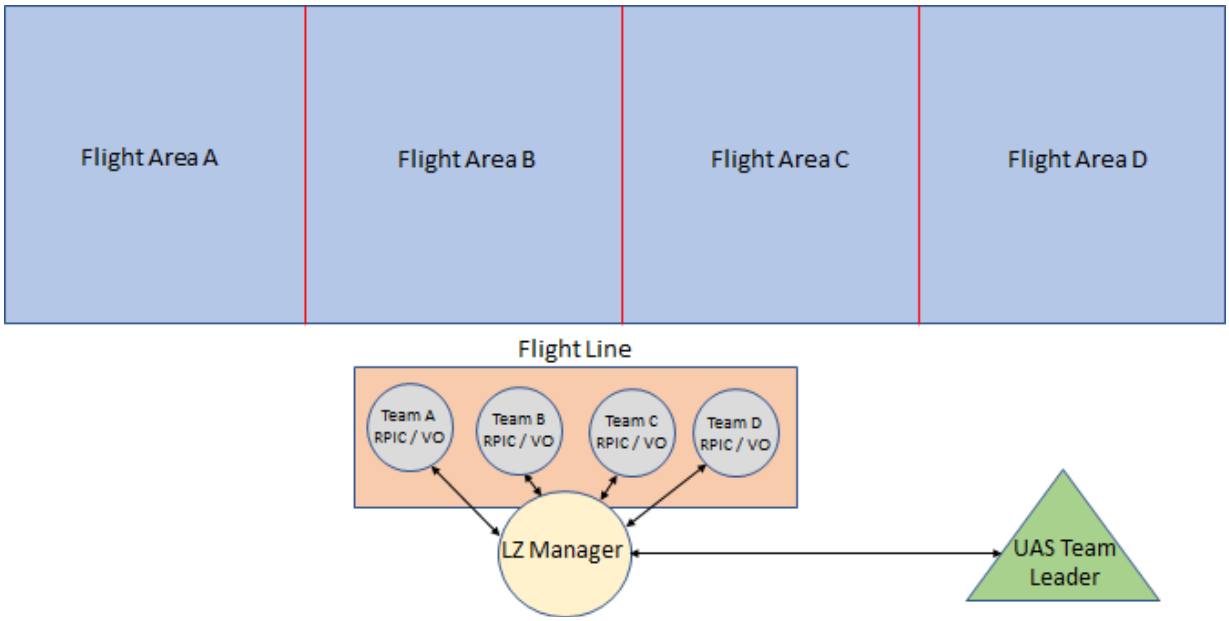
8.7 Multi-Aircraft (UAS) Operations

Note: This section covers multiple UAS flying from the same landing/takeoff zone. For joint operations with manned aircraft, see Section 9: Manned and Uncrewed Joint Operations.

When three or more aircraft are flying from the same landing/takeoff zone, a Landing Zone (LZ) manager and UAS Team Leader are required.



The LZ Manager stands on the flight line and is in direct contact with each RPIC/VO team so that they can react quickly to any situation. The LZ Manager is also in radio contact with the UAS Team Leader who is typically situated at the Command Post.



Note:

- For information about each position, see Section 3: Team Organization.
- For a Flight Team Leader Checklist, see Appendix B: Flight Team Leader (Air Boss) Checklist Example

8.8 Operations Documentation

Documentation of all operations associated with UAS activities is required regardless of the airspace in which the UAS operates.

8.8.1 Special Government Interest (SGI)

In controlled airspace outside of the SRFD COA, the RPIC or Coordinator shall obtain a waiver by filing a Special Government Interest (SGI) by contacting:

FAA Systems Operations Support Center (SOSC)

Contact number: 202.267.8276

Email Address: 9-ATOR-HQ-SOSC@faa.gov

Provide the following information:

- Approval to conduct a UAS operation in <restricted airspace>.
- The name of the government agency and contact information for the person who has granted approval for the UAS operation.

The Systems Operations Support Center (SOSC) can be reached 24/7. The turnaround time for granting an SGI is ~30-60 minutes after the form has been received by SOSC. However, if the request is for a safety of life operation, or a law enforcement operation where the UAS needs to fly immediately, an SGI can be granted over the phone before all the paperwork has been processed.

Note: For more information, see Appendix I: Special Government Interest (SGI) Submission Form Example.

8.8.2 Notice to Airmen (NOTAM)

A NOTAM shall be issued whenever flight operations are scheduled or required by a COA or Part 107 waiver. A NOTAM may be accomplished by contacting the NOTAM Flight Service Station not more than 72 hours in advance, but not less than 48 hours prior to the operation, unless otherwise authorized as an FAA waiver or exigent circumstances. When mission is complete, a NOTAM should still be filed.

NOTAM Flight Service Station

Contact number: 1.877.487.6867

Website: https://www.1800wxbrief.com/Website/#!/

The issuing agency requires the following information:

- Name and address of the person filing the NOTAM request
- Location, altitude, or operating area
- Radial off nearest airport
- Time and nature of the activity
- COA number if operating under a COA

8.8.3 On-Scene Documentation

The UAS Coordinator shall ensure that the following documents are available at any deployment site:

- RPIC FAA Part 107 Remote Pilot certificates
- RPIC log books
- Copy of all waivers
- Copy of COA

8.8.4 RPIC Log Book

Every RPIC shall keep a log of all flights – for training and deployment – that includes such information as:

- Date of flight
- Aircraft make and model
- Aircraft registration number
- Flight location
- Mission description
- Flight start time
- Duration of flight
- Maximum altitude

8.9 Operational Transparency

Being transparent about UAS operations is critical to building trust with those affected by the deployment; therefore, the following protocols shall be implemented for all UAS deployments:

- When available, utilize flashing lights on all UAS to indicate operation and location in flight unless the Incident Commander (or designee) determines that it would jeopardize or compromise the deployment of the UAS in an incident involving an imminent threat to public safety.
- RDPO members shall identify themselves with an identification card that represents their qualification level.
- RDPO members shall wear clothing consistent with the identification of the department they represent.
- When possible, notification shall be made to residents in the immediate UAS operations area prior to deployment.

8.10 Observers During Scenario-Based Training

Observers shall receive a safety briefing that addresses the mission intent, non-interference with any mission personnel, and emergency procedures in the event of an incident or accident.

Observers shall be directed to, and contained within, a specific observation area that minimizes risk of injury and assures non-interference with the UAS training mission.

A flight crew member shall be designated to ensure that observers do not distract any mission personnel from the performance of their duties or interfere in any way with the proper conduct of those duties by engaging in conversations, discussions, interviews, or other distractions.

Flight Operations shall limit the number of observers to that which can be adequately monitored and protected by the personnel resources onsite.

Section 9: Manned and Uncrewed Joint Operations

Note: This section covers joint operations with manned aircraft. For multiple UAS flying from the same landing/takeoff zone, see Section 8.7 Multi-Aircraft (UAS) Operations.

Factors commonly contributing towards airspace conflict for public safety manned and uncrewed aircraft include notification of presence, lack of or poor communications, and lack of or inadequate policies, procedures, and training to support interoperability.

To ensure safe, coordinated, and effective response of aerial resources, an accountability system shall be implemented at all incidents where aircraft are utilized. The system is only effective if all participating agencies commit to it.

9.1 Policy

- Command will maintain resource accountability at all incidents.
- Incident Commanders are responsible for the notification to incident aircraft, tracking and documenting of responding unit response (to include aerial resources), and utilizing tactical worksheets and incident action plans.
- Manned aircraft take priority and have precedence over airspace.
- Both manned and uncrewed resources shall establish and maintain communications.
- All aerial resources shall establish and maintain separation assurance standards through the demarcation of altitude, horizontal distance, and /or geographical areas of operation.
- Dispatch will announce UAS operations during incident response. UAS operations shall be communicated to manned aircraft at the time of the request.

9.2 Communications

During both training and emergency incident response, radio communications shall be established and maintained between both the manned and uncrewed aircraft.

Typically, all Air Operations communications (manned and uncrewed) take place on the assigned Air Ops channel. For example, an Air Operations channel is assigned to emergency response incidents that occur within Travis County.

A second option is the air-to-air frequency of 123.025; however, this is not currently available on many department radios.

If no communication has been established, the UAS shall land immediately upon hearing or seeing any public safety aircraft until positive communication is established.

9.3 Separation Assurance Standards

Operations may occur up to a maximum altitude of 400 feet AGL or, if higher than 400 AGL, remain within 400 feet of a structure unless otherwise approved by waiver. Most UAS operations take place at 200 feet AGL or below.

When working in joint airspace, safe separation of aircraft shall be maintained through altitude, horizontal distance, and /or geographical areas of operation such as using roads, rivers, or other natural dividing lines to deconflict the air space. The RPIC shall establish direct communication with the manned resource and develop the necessary separation clearances.

If communication cannot be established, or separation cannot be maintained, the UAS shall give right-of-way to the manned aircraft and return to its landing area until flight becomes safe again.

Section 10: Landing Sites and Recovery

10.1 Launch Site Selection

Selection of a launch site shall be first and foremost driven by safety. Launch site selection is based upon:

- **Ability to maintain adequate buffer zones between aircraft and personnel** - Maintain a buffer of at least 25 feet for VTOL aircraft between aircraft operations and all non-essential personnel. Designate a Safety Officer to ensure the safety of the launch and recovery area.
- **Environmental Assessment** - No launches shall occur until all environmental assessments have been considered. The RPIC has the final authority to abort any launch based on hazards to the environment and/or personnel in the area.
- **Populated Areas** - Select a launch site that ensures aircraft departures are not in or over populated areas.

10.1.1 Weather

The RPIC shall verify the weather conditions in the immediate area of operations using a local source of weather, the internet, phone application, or other appropriate method. The aircraft shall not be flown outside the weather minimums identified by the manufacture or an approved Certificate of Waiver/Authorization (COA) or FAA Part 107. The RPIC shall have final determination of risk due to weather and authority over any mission. Consider manufacturer's safe wind speed as well as operational necessity.

10.1.2 Proximity to Controlled Airspace

Operations inside any controlled airspace shall only be performed after a notification is made through LAANC and, if necessary, by obtaining an SGI. 'FORE Flight' should be the primary method for redundant deconfliction for all agencies.

> **Note:** For more information, see Section 7: Airspace Authority.

10.2 Primary and Alternate Landing Sites

10.2.1 Primary Landing Sites

Typically, the primary landing site shall be the same as the launch site. The RPIC has final authority for any approaches to the primary site and may wave off any approach deemed unsafe.

10.2.2 Alternate Landing Sites

The RPIC shall designate at least one alternate landing site. If the primary landing site is deemed unsafe, procedures to utilize the secondary site shall be invoked.

10.2.3 Mission Abort Sites

The RPIC may optionally designate an "abort site" whereby the aircraft may be "dumped" in an emergency. The abort site shall be so far removed as to provide absolute minimal risk should the aircraft be required to vacate airspace in an emergency. The aircraft may be flown to this site and landed without regard to the safety of the aircraft or flight equipment should the RPIC deem it necessary.

10.2.4 Landing Safety and Crowd Control

All landing sites shall be maintained and operated as the launch sites. Personnel shall maintain a buffer of at least 25 feet for VTOL aircraft between aircraft operations and all non-essential personnel.

10.3 Takeoff and Landing

Each RPIC shall utilize a separate launch/landing pad within the LZ for taking off and landing to reduce potential for collisions. Takeoff requires a checklist and FRAT.

10.3.1 Takeoff

Prior to take off, program the aircraft to allow an appropriate return to home altitude.

> **Note:** For more information, see Section 11.1 Lost Link / GPS Procedures.

RPIC's shall obtain mission, altitude, and lift-off approval from the UAS Team Leader or LZ Manager before taking off. If no UAS Team Leader or LZ Manager is assigned, RPIC's shall coordinate operations together.

All Type III and Type IV rotary aircraft take off vertically until they reach 20 feet AGL at which time the RPIC shall verify that all controls are working correctly. After verification, maneuver the aircraft to the assigned altitude and proceed with the mission. Maintain a designated safe area of at least 25 feet between the aircraft and personnel during lift off.

10.3.2 Landing

When the aircraft is deployed to meet an approved mission task, it shall be recovered within the same general area, if possible. Landing checklist SHALL be used for all landings.

If a UAS Team Leader or LZ Manager is assigned, RPIC's shall obtain permission to land before approaching the landing zone. If no UAS Team Leader or LZ Manager is assigned, RPIC's shall coordinate operations together.

All aircraft shall approach the landing site at the assigned altitude, maintain that altitude above landing point/pad, and then descend to 15 feet AGL. At 15 feet AGL, RPIC's shall hover the aircraft and verify all persons or obstructions are clear of landing pad. After it is determined that it is safe to land, the aircraft shall descend until on the landing pad.

10.4 Hazards

10.4.1 Hazards to the Public

The RPIC shall make every effort to ensure that flight operations do not pose any undue risk to the public. The RPIC shall have final determination of risk to the public and authority over the launch of the aircraft. In all cases, the aircraft shall not be flown over persons in violation of the FAA approved COA or Part 107.

10.4.2 Hazards to Property

The RPIC shall make every effort to ensure that flight operations do not pose any undue risk to any property in the area. The RPIC shall have final determination of risk to property and authority over the launch of the aircraft. In all cases, the aircraft shall not be flow over property in violation of the FAA approved COA or Part 107.

10.4.3 Hazards to Personnel

The RPIC shall make every effort to ensure that flight operations do not pose any undue risk to the personnel directly involved with the effort. The RPIC shall have final determination of risk and authority over the launch of the aircraft.

Section 11: Emergency, Contingency, Mishap Procedures

Note: For more information, see Appendix E: Contingency Plan Checklist. Appendix O: Mishap Guide

11.1 Lost Link / GPS Procedures

Lost link is an interruption or loss of the control link between the control station and the uncrewed aircraft. This prevents control of the aircraft and results in the aircraft performing pre-set lost link procedures. While operating in controlled airspace, in the event of a lost link that cannot be re-established within a reasonable time, a designated crew member shall immediately notify the appropriate authority.

When possible, lost link and lost GPS procedures shall comply with the following:

- The aircraft autopilot will enter a lost link mode within 10 seconds of the lost link condition being detected, return to the LZ or other defined lost link waypoint within the UAS operating area, and land.
- If the aircraft loses GPS, the RPIC will immediately attempt to land the aircraft in a safe location by controlling it manually or landing at the current location within the operating area.
- If both GPS and data link are lost, the aircraft will automatically land at the current position.

11.2 Emergency or Fly-Away Procedures

In the event of a fly-away or other emergency scenario while operating in controlled airspace, the designated crew member shall immediately notify the appropriate authority and provide the following information:

- The nature of the emergency
- Last known aircraft position, altitude, and direction of flight
- Maximum remaining flight time

11.3 Lost Sight

If a VO loses sight of the aircraft, the VO shall immediately notify the RPIC. The RPIC shall place the aircraft into hover mode while the RPIC and VO try to reestablish visual contact with the aircraft. If the aircraft is visually reacquired promptly, the mission may continue. If visual contact is not reacquired within a reasonable period of time, the RPIC shall initiate the Return to Home sequence.

For operational necessity, the RPIC or person manipulating the controls may intentionally maneuver the UAS so that they lose sight of it for brief periods of time. In this case, the RPIC must regain VLOS as soon as practicable. For example, a RPIC stationed on the ground utilizing a UAS to inspect a rooftop may lose sight of the aircraft for brief periods while inspecting the farthest point of the roof. As another example, a RPIC conducting a search operation around a fire scene may briefly lose sight of the aircraft while it is temporarily behind a dense column of smoke.

However, it must be emphasized that even though the RPIC may briefly lose sight of the UAS, the RPIC always has the see-and-avoid responsibilities set out in Part 107, §§ 107.31 and 107.37. The circumstances of what would prevent a RPIC from fulfilling those responsibilities will vary, depending on factors such as the type of UAS, the operational environment, and distance between the RPIC and the UAS. For this reason, there is no specific time interval that interruption of VLOS is permissible, as it would have the effect of potentially allowing a hazardous interruption or prohibiting a reasonable one.

11.4 First Aid Kits and Training

Oregon requires all firefighters to be EMT-Basic certified and all police officers to complete basic first aid training. It is recommended that a first aid kit is on-site at every mission location in case of injury.

11.5 Mishap Guides

SRFD Aviation Mishap Response Guide

UAS INCURSION:

A UAS incursion is defined as a non-participating UAS operating over or near an incident that intrudes into a TFR or interferes with fire management efforts. The incursion is documented through the appropriate reporting system such as SAFECOM and dispatch incursion form.

Time	Action	Contact and Phone	Time Log
Immediately upon sight and/or notification of incursion	• Notify ATGS, aircraft in the area, and ground personnel. • Clear the affected airspace and suspend air operations in area. • Notify flight following contact, AOBD, and/or dispatch as required. • Request Law Enforcement or Counter UAS Team (cUAS) • Wait for the non-participating UAS to be identified, located, stopped and/or voluntarily depart area.		
After non-participating UAS departs	• Resume air operations. • Complete UAS Incursion Form • Dispatch centers should report UAS incursions to the nearest Air Traffic Control Center • File a SAFECOM		
Notifications	Incident • Notify IC, Agency Head and RDPO UAS Coordinator *Note:* Additional FAA guidance for law enforcement personnel can be found at: https://www.faa.gov/uas/resources/policy_library/media/FAA_UAS-PO_LEA_Guidance.pdf.		

UAS FLYAWAY

Approved UAS have built in failsafe systems. The aircraft will return to home to the identified launch and recovery zone in the event of low battery voltage or loss of link with the GCS. However, in a flyaway situation, the pre-set link procedures are not established or are not being executed by the unmanned aircraft, creating an emergency situation.

Time	Action	Contact and Phone	Time Log
Immediately after lost link	• Notify ATGS, aircraft in the area, and ground personnel. • Clear the affected airspace and suspend air operations in area. • Notify flight following contact, AOBD, and/or dispatch as required. • Wait for the duration of the fuel/battery load.		
After fuel and battery load has passed	• Resume air operations. • Search for the missing UAS. • Follow established mishap reporting procedures based on damage and/or injury (See notifications below)		
Notifications	Minimal damage to UAS and/or payload • Notify IC, Agency Head and RDPO UAS Coordinator Total system loss of UAS and/or payloads (***Not*** *FAA reportable*) • Notify IC, Agency Head and RDPO UAS Coordinator Damage to personnel or property in addition to the UAS and payload (*FAA reportable*) • Notify IC, Agency Head and RDPO UAS Coordinator		

UAS MISHAP/ACCIDENT

If the incident aircraft was operational at the time of a mishap, at least one of the following criteria represent trigger(s) for a mandatory notification to the RDPO UAS Program Lead:

• Operations over people

• Death or Loss of Consciousness*

• $500.00 collateral damage (non-UAV)*

• 300 pound UAV or greater*

Time	Action	Contact and Phone	Time Log
Immediately at time of UAS mishap	• Notify IC or aviation designee, aircraft in the area, and ground personnel if applicable. • Notify flight following contact, and/or dispatch as required.	Section 12: Communications	
30 minutes	• Search and recover missing UAS. Do no delay notifications for search and recovery operations. • Follow established mishap reporting procedures based on damage and/or injury (See below) • Complete Aircraft Accident Checklist Do not delay notification if you do not have all the blocks filled. Provide as much information as you can and follow-up when additional info is available		
Notifications	Minimal damage to UAS and/or payload • Notify IC, Agency Head and RDPO UAS Coordinator Total system loss of UAS and/or payloads (***Not*** *FAA reportable*) • Notify IC, Agency Head and RDPO UAS Coordinator Damage to personnel or property in addition to the UAS and payload (*FAA reportable*) • Notify IC, Agency Head and RDPO UAS Coordinator		
NTSB/FAA Reportable UAS Accident	• UAS Mishap Investigation Authorization (required) • Aviation Mishap Investigation UAS Notification (Required) • UAS Mishap Investigation Report (required) • SAFECOM (required) • UAS Mishap Investigation Board (optional) *Note:* Any UAS mishap may be investigated at the discretion of the RDPO UAS Program Manager.		

NTSB/FAA Reportable

A UAS accident is defined by the National Travel Safety Board (NTSB) as an occurrence associated with the operation of any public or civil UAS that takes place between the time that the system is activated with the purpose of flight and the time that the system is deactivated at the conclusion of its mission, in which any person suffers death or serious injury, or the UAS has a maximum gross takeoff weight of 300 pounds or greater and sustains substantial damage. In the case of a midair collision between a manned aircraft and a UAS that weighs less than 300 pounds in which no injuries were sustained, consideration should be given to the damage incurred to the manned aircraft to determine if the criteria for substantial damage to the manned aircraft has been met.

AIRCRAFT CONFLICT INITIAL REPORT *(UAS Intrusion)*

(Complete known information below. Attach additional narrative sheet if necessary.)

Date/Time:	**Submitted By:** *Name/Position* _____ **Phone:** _____ **Email:** _____

REPORTING PARTY (RP) INFORMATION: *(if different from above)*

RP Location was ☐ Airborne ☐ Ground **Estimated Dist. from RP to Observed Aircraft:** _____

RP Location during observation: *(Geographic Landmark, Incident Division, Latitude-Longitude, etc.)*

TYPE OF CONFLICT or OBSERVATION *(Check one or more as applicable):*

☐ Aircraft in general vicinity ☐ Near Mid-Air Collision ☐ In Military SUA or MTR ☐ TFR Intrusion ☐ Other:

Estimated separation distance between aircraft:

AIRCRAFT INFORMATION: **Observed Aircraft was operated by:** ☐ Military ☐ Civilian ☐ unknown

Category: ☐ UAS ☐ Airplane ☐ Helicopter ☐ Ultralight ☐ Hang glider/Paraglider ☐ Other _____

***If a fixed wing/airplane*:** ☐ High-Wing ☐ Low-Wing ☐ Biplane ☐ Twin-tail booms ☐ V-tail ☐ Other ☐ unknown

Engine Configuration: *(Number and type of engines/rotors, Jet vs. Prop, etc.)*

_____

Landing Gear: ☐ Fixed (Tricycle or Tailwheel) ☐ Retractable ☐ Floatplane ☐ Other ☐ unknown

Paint Colors or Distinct Markings: *(Include N #, if known)*

_____

Make/Model (if known): _____ **Approx. Altitude:** _____ **AGL**

Observed Activity: ☐ straight/level ☐ circling ☐ erratic maneuvering ☐ hover/slow flight

NARRATIVE:	**If TFR Intrusion, was FAA notified?** ☐ Yes ☐ No	**Was a SAFECOM submitted?** ☐ Yes ☐ No (to be filed)

SUPPLEMENTAL INFORMATION FOR UAS INTRUSION

Type of UAS if known: ☐ Fixed-Wing ☐ Helicopter ☐ Quad Copter ☐ Other	**Approx. size of UAS:**	**Types of Agency Aircraft Flying:** ☐ Rotor-Wing ☐ Fixed-Wing ☐ None	**Were Agency Aircraft Grounded?** ☐ Yes ☐ No	**Types of operations impacted:**

Section 12: Communications

12.1 Introduction

Every year, Oregon public safety agencies and their utility partners and local / state agencies respond to medium to large scale incidents that range from moderate to high levels of complexity. During the responses, the one underlying parameter required before, during, and after, is the ability to communicate not only with the same agency resources but also requested and support based adjoining agencies.

This communication plan includes suggested guidelines and potential trigger points for larger incidents as well as incidents where multiple agencies and local cooperators come together as a force multiplier to benefit the Oregon Fire Districts in large-scale multi-operational period disasters.

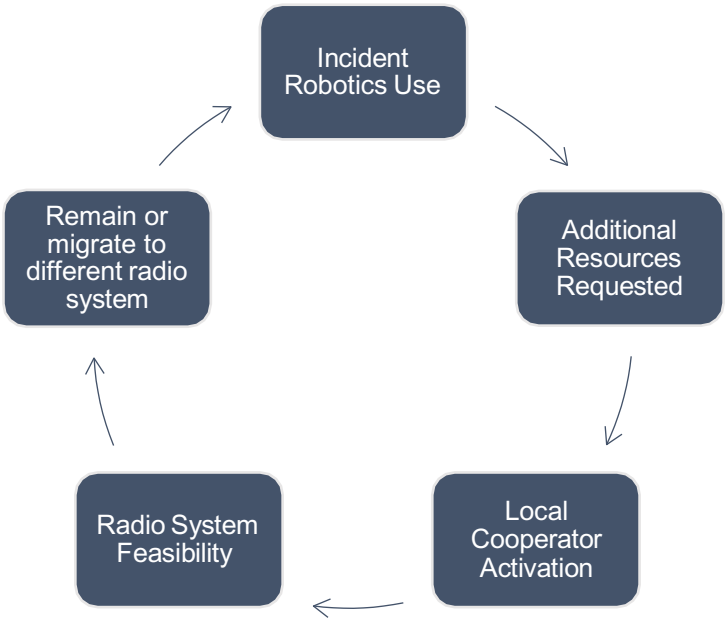
12.2 Incident Communications

Incident personnel assigned with the creation of communication plans should, as they see fit, continue to use the primary radio system that was assigned during the initial response of the incident. The ability to assign loaner radios that allow access to this system should be considered to avoid “patching” of radio systems. Patching of radio systems can lead to a delay in mission critical communications.

Active partners within this group shall work with their respective organizations to ensure applicable radio frequencies are programmed within their radio system. Agencies that are not capable of direct system programming of these channels shall make this information known prior to deployment so that equipment can be supplied to maintain overall operational effectiveness.

12.3 Radio System Decision Matrix

The matrix below gives tangible decision points to consider for the Incident Command/Robotics Team Lead to consider before a potential radio system change within the incident.



12.4 State Interoperability Communications Plan

SAFECOM standards and the SAFECOM Interoperability Continuum should be used as a tool to develop the Comm Plan / Matrix

[1] **Allowable use for VTAC17 and VTAC17D:** Base stations: 50 watts max, antenna HAAT 400 feet max. Mobile stations: 20 watts max, antenna HAAT 15 feet max. These channels are for tactical use and may not be operated on board aircraft in flight. These channels use narrowband FM and are available only in certain inland areas at least 100 miles from a major waterway. These channels use the same frequencies as VHF Marine channel 25, which uses wideband FM. Use only in authorized counties listed below. In these authorized areas, interoperability communications have priority over grandfathered public coast and public safety licensees.

[2] **VTAC17 and VTAC17D may ONLY be used in the following counties:** Andrews Armstrong Bailey Borden Brewster Briscoe Callahan Carson Castro Childress Cochran Coke Collingsworth Concho Cottle Crane Crockett Crosby Culberson Dallam Dawson Deaf Dickens Donley Ector Edwards El Paso Fisher Floyd Gaines Garza Glasscock Gray Hale Hall Hansford Hartley Haskell Hockley Howard Hudspeth Hutchinson Irion Jeff Davis Jones Kent Kimble King Kinney Knox Lamb Lipscomb Loving Lubbock Lynn Martin McCulloch Menard Midland Mitchell Moore Motley Nolan Ochiltree Oldham Parmer Pecos Potter Presidio Randall Reagan Reeves Roberts Runnels Schleicher Scurry Sherman Sterling Stonewall Sutton Swisher Taylor Terrell Terry Tom Green Upton Val Verde Ward Wheeler Winkler Yoakum **(extracted from the National Interoperability Field Operations Guide** https://www.dhs.gov/national-interoperability-field-operations-guide).

12.5 Radio Operations

To better facilitate the rapid dissemination of information to all parties involved, the following guidelines shall be used to enhance effective and concise communications:

- UAS crews shall maintain the ability to monitor assigned radio frequencies.
- The VO shall be in charge of radio operations to allow the RPIC to concentrate on flight operations
- UAS crews shall utilize clear speak over the radio to ensure the relayed information is understood. Use of 10-codes shall be prohibited.
- All UAS crews shall receive manned aircraft communications as a priority transmission and respond accordingly to minimize potential aircraft incursions.
- Imperial measurements shall be used to convey pertinent information (height, speed... and so on). For example, “Fairgrounds I.C Uncrewed Romeo 3-1 is off the ground, on a heading of 340 degrees, 30 min of flight time, working altitude of 400 AGL, on an IR flight”.
- Prior to launching the UAS, a blind radio transmission shall be made to ensure all aircraft on the incident are aware of intent. Sufficient delay should be allowed for a response before taking off.
- After the UAS is airborne, the VO shall communicate with any aircraft in the air (speed, height, heading, total flight time, type of mission).
- Communication of GPS coordinates shall utilize the Decimal Degrees format. Landmarks and Geographical references may also be used. This allows for manned aviation to quickly input this information into flight computers to ascertain the location of UAS crews.

12.6 Aircraft Call Signs

RPIC's shall follow established incident communications protocols and make radio calls with the following information:

- Uncrewed Aircraft
- Configuration (fixed or rotor-wing)
- Type
- Agency/Interagency assigned aircraft number

12.6.1 Call Sign Examples – Add the last 2 or 3 numbers on the FAA registration

- "Uncrewed R41" (Rotor Wing, Type 4 UAS, #1) "Uncrewed Romeo 41 3 kilo"
- "Uncrewed F12" (Fixed Wing, Type 1 UAS, #2) "Uncrewed Foxtrot 12 November golf"
- "Uncrewed R23" (Rotor Wing, Type 2 UAS, #3) Uncrewed Romeo 23 x-ray mike"

12.7 Communications Support Resources

12.7.1 Oregon Military / Reserves / Natl Guard / Active duty

- UH60 and CH47 helicopters with commercial VHF/UHF radio (non-P25)
- Cell Phone, Email and SMS Text Messaging
- 1000 - Cell phones
- 10 Deployable HF Stations w/Email via HF PMBO gateways (TXSG on MARS & RACES/Ham nets)
- Sustaining Base Command and Control Data Network with Primary and Alternate Data Centers, dedicated ATM T1 data links to 101 sites and all required systems to support disaster response, MS Exchange Email, CITRIX Remote Access Portal, VPN, WEBEOC, SharePoint Website, and so on. Supports all deployed satellite packages.

Section 13: Data Management Best Practices

Digital images collected during training and operations are a critical resource for evaluating the effectiveness and efficiencies of SRFD procedures. Protocols must be in place to ensure data is properly managed and maintained regarding security and storage of electronic images.

13.1 SRFD Data Management Policy

At the conclusion of each mission, all data (stills, video, and documentation) collected during the mission shall be submitted to the District / Department running the mission. That District / Department shall manage, retain, and disseminate the data in compliance with their data management policy.

Note: If your District / Department does not have a data policy, the information that follows in this section can be used as a guide for creating a policy. Agencies flying under the COA have to adopt the SRFD/RDPO policy. The current policy Link.

13.2 Data Collection

SRFD digital imagery shall be used for official business only. All data/images (critical data, non-critical data, or training events) obtained during UAS operations are the property of the district in charge of the mission, except when the data is obtained at the request and on behalf of another agency.

All UAS flights shall be documented and reported by the RPIC or Data Specialist within <specify the number of days>. At a minimum, flight records shall include:

- Date and time
- Operational area
- Name of the RPIC
- Name of the VO, if applicable
- Aircraft identification
- Flight time
- Any incidents/accidents/mishaps
- Purpose of the flight

Digital imagery may be temporarily stored on or accessed via a hard drive or external hard drive to meet an operational need. After the electronic data is no longer needed, the images must be removed from the hard drive or external hard drive system and delivered to the District / Department in charge for storage.

13.3 Data Retention

The District / Department running the mission retains any aircraft/flight records or data, including but not limited to images and/or videos and flight telemetry that are collected by the UAS equipment. The memory card or processed data shall be checked in, and the images contained therein shall be processed into an approved data storage system.

Digital images shall be downloaded in accordance with the District / Department's data management policy. All required information (meta-data tags) shall be entered to ensure proper identification and that the chain of custody of images is maintained. These images will not be stored in any other unauthorized locations.

If the digital imagery is related to an investigation, the SRFD member shall ensure chain of custody by following procedures related to the requesting District / Departmental agency.

Members will not store, transfer, or utilize electronic images and digital imagery for personal use.

13.3.1 Collection and Use

The Districts / Departments shall only collect information using a UAS to the extent that such collection or use is consistent with and relevant to an authorized purpose of the District.

> **Note:** For more information, see Appendix H: ORS 837.300 : Use of Uncrewed Aircraft.

Information collected using the UAS that may contain personally identifiable Information (PII) shall not be retained for more than 60 days from recording unless retention of the information is determined to be necessary to an authorized mission of the District / Department, is maintained in a system of records covered by the Privacy Act, or is required to be retained for a longer period by any other applicable law or regulation.

13.3.2 Data Retention Timeframe

All digital imagery shall be retained for a period of time that is consistent with the department policy and procedures and any state or local Government Retention schedules, but for no less than a period of 90 days from the date the data was captured.

> **Note:** For more information, see the Oregon State Local Government Retention Schedules: Appendix H: ORS 837.300 : Use of Uncrewed Aircraft.

Prior to disposal of any digital imagery, the SRFD member shall communicate with their PIO, Investigations, and Department, City, Municipal, or County Legal division to ensure that the digital imagery is not the subject of a pending Public Information Act request, and/or has no evidentiary value in any pending or potential administrative, civil, criminal, or other legal proceedings.

Upon expiration of the applicable retention period, digital imagery stored shall be disposed of unless retained as part of an investigation.

Unless otherwise noted, the department shall adhere to the following data retention schedule:

Mission Type	Retention Period
Trainings/Non-Response	90 days
Incident Response	2 years
Incident Response or Training (personnel Injured)	5 years
Structure Fires/Hazmat Incidents/Disasters	5 years
Criminal Investigations	10 years

13.4 Dissemination

District / Department members shall not post, transmit, or otherwise disseminate any records or data, including images or videos, obtained via the UAS without the express consent of the department.

Data that is not maintained in a system of records covered by the Privacy Act shall not be disseminated outside of the District / Department unless dissemination is required by law or fulfills an authorized purpose and complies with District / Department requirements.

13.4.1 Data Requests

All Agency open records, legal, and mission requests for copies of stored data/images shall be in writing and shall follow the request protocol outlined in the data management policy of the District / Department that owns the data.

After the request is approved, the requested copies of data imagery shall become the property of the requesting organization.

Section 14: Reporting Requirements

14.1 FAA Reporting Requirements

14.1.1 Reporting Requirements: 14 CFR § Part 107

No later than 10 calendar 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 small uncrewed aircraft involving at least:

(a) Serious injury to any person or any loss of consciousness; or

(b) Damage to any property, other than the small uncrewed aircraft, unless one of the following conditions is satisfied:

- The cost of repair (including materials and labor) does not exceed $500; or
- The fair market value of the property does not exceed $500 in the event of total loss.

14.1.2 Reporting Requirements: COA

1. Any report will be submitted to the COA administrator (SRFD UAS Manager) first for review then to the FAA as soon as practicable.
2. Documentation of all operations associated with UAS activities is required regardless of the airspace in which the UAS operates. NOTE: Negative (zero flights) reports are required.
3. The operator must submit the following information through the COA administrator and 9-AJV-115-UASOrganization@faa.gov on a monthly basis:
    a. Name of Operator, exemption number, and aircraft registration number
    b. UAS type and model
    c. All operating locations, to include location city/name and latitude/longitude
    d. Number of flights (per location, per aircraft)
    e. Total aircraft operational hours
    f. Takeoff or landing damage
    g. Equipment malfunctions. Reportable malfunctions include, but are not limited to, the following:
        i. On-board flight control system
        ii. Navigation system
        iii. Power plant failure in flight
        iv. Fuel system failure
        v. Electrical system failure
        vi. Control station failure
4. The number and duration of lost link events (control, performance and health monitoring, or communications) per UAS per flight.
5. Incident/Accident/Mishap Reporting After an incident or accident that meets the criteria below, and within 24 hours of that incident, accident or event described below, the proponent must provide initial notification of the following to the FAA via email at 9-AJV-115-UASOrganization@faa.gov and via the UAS COA On-Line forms (Incident/Accident).
    a. All accidents/mishaps involving UAS operations where any of the following occurs:
        i. Fatal injury, where the UAS results in a death occurring within 30 days of accident

ii. Serious injury, where the operation of a UAS results in: (1) hospitalization for more than 48 hours, commencing within 7 days from the date of the injury was received; (2) results in a fracture of any bone (except simple fractures of fingers, toes, or nose); (3) causes severe hemorrhages, nerve, muscle, or tendon damage; (4) involves any internal organ; or (5) involves second- or third-degree burns, or any burns affecting more than 5 percent of the body surface.

iii. Total uncrewed aircraft loss.

iv. Substantial damage to the uncrewed aircraft system where there is damage to the airframe, power plant, or onboard systems that must be repaired prior to further flight.

v. Damage to property, other than the uncrewed aircraft.

b. Any incident/mishap that results in an unsafe/abnormal operation including but not limited to:

i. A malfunction or failure of the uncrewed aircraft's on-board flight control system (including navigation)

ii. A malfunction or failure of ground control station flight control hardware or software (other than loss of control link)

iii. A power plant failure or malfunction

iv. An in-flight fire

v. An aircraft collision involving another aircraft.

vi. Any in-flight failure of the uncrewed aircraft's electrical system requiring use of alternate or emergency power to complete the flight

vii. A deviation from any provision contained in the COA

viii. A deviation from a LAANC clearance and/or Letter(s) of Agreement/Procedures

ix. A lost control link event resulting in

1. Fly-away, or

2. Execution of a pre-planned/unplanned lost link procedure.

c. Initial reports must contain the information identified in the COA On-Line Accident/Incident Report.

d. Follow-on reports describing the accident/incident/mishap(s) must be submitted by providing copies of proponent aviation accident/incident reports upon completion of safety investigations.

e. Civil operators and Public-use agencies (other than those which are part of the Department of Defense) are advised that the above procedures are not a substitute for separate accident/incident reporting required by the National Transportation Safety Board under 49 CFR Part 830 §830.5.

f. For other than Department of Defense operations, this COA is issued with the provision that the FAA be permitted involvement in the proponent's incident/accident/mishap investigation as prescribed by FAA Order 8020.11, Aircraft Accident and Incident Notification, Investigation, and Reporting.

14.1.3 FAA Report Submission

Any incident or accident that occurs while operating under a COA shall be reported to the FAA via the CAPS On-Line Accident/Incident Report and initially reported via email at: 9-AJV-115-UASOrganization@faa.gov.

All other incident/accident reports may be submitted to the FAA Regional Operations Center by phone at 817.222.5006 or electronically at http://www.faa.gov/about/office_org/field_offices/fsdo/.

The report must include the following information:

- UAS RPIC's name and contact information

- UAS RPIC's FAA airman certificate number
- UAS registration number issued to the aircraft, if required
- Location of the accident/incident
- Date of the accident/incident
- Persons injured and extent of injury, if any or known
- Property damaged and extent of damage, if any or known
- Description of accident/incident

14.2 NTSB Reporting Requirements (49 CFR §830)

Federal regulations require operators to notify the NTSB immediately of aviation accidents and certain incidents. An accident is defined as an occurrence associated with the operation of an aircraft that takes place between the time any person boards the aircraft with the intention of flight and all such persons have disembarked, and in which any person suffers death or serious injury, or in which the aircraft receives substantial damage. An incident is an occurrence other than an accident that affects or could affect the safety of operations.

14.2.1 NTSB Report Submission

All incident/accident reports may be reported to the NTSB's Response Operations Center (ROC) at 844.373.9922. A phone call is sufficient initially, but a written follow-up may be required.

When contacting the ROC, be ready to provide the following information (49 CFR 830.6):

- Type, nationality, and registration marks of the aircraft
- Name of owner, and operator of the aircraft
- Name of the RPIC
- Date and time of the accident
- Last point of departure and point of intended landing of the aircraft
- Position of the aircraft with reference to some easily defined geographical point
- Number of persons aboard, number killed, and number seriously injured
- Nature of the accident, the weather and the extent of damage to the aircraft, so far as is known
- A description of any explosives, radioactive materials, or other dangerous articles carried

Contacting the NTSB ROC and providing the above listed items satisfies the reporting requires dictated by **49 CFR 830.5 – Immediate Notification**.

Section 15: Training and Certification Process

15.1 Overview

The purpose of the ORPIC certification is to create a standard for Public Safety RPIC's. This is imperative in cases where RPIC's are requested for a multi-District / Departmental mission.

For example, if you have a large-scale night mission and you need aid from neighboring Districts / Departments, you can request Level 2 ORPIC's and you know that they will have the experience you need to fly the mission.

The SRFD and RDPO program includes the following courses:

- **ORPIC Level 1** – Day missions, indoor and outdoor flights (flight activities for normal Part 107 pilot).
- **ORPIC Level 2** – All COA activities / flights: Day missions, night missions, indoor and outdoor flights
- **SRFD UAS Visual Observer**

After a RPIC is certified at a specific level and on a specific aircraft, they are added to the SRFD database. A SRFD agency may access the database to confirm a RPIC's level and aircraft type.

15.2 Aircraft Type

Each certification has a level and a specific aircraft type. For example, you may be a SRFD Level 2 RPIC on the Mavic 2 Enterprise. You have to certify separately for each aircraft you wish to fly.

If you have completed ground school within the past year, on the level for which you are certifying with the new aircraft, you only need to complete the hands-on and scenario-based portions of the Level 1 or Level 2 course to qualify on the new aircraft. If it has been more than a year since you completed ground school, you will need to complete the recertification course which includes flight time. If you are certifying at a higher level, you will need to complete the entire course on the level for which you are certifying.

15.3 UAS Proficiency Course

The UAS proficiency course ensures that all department RPIC's have the skills necessary to safely operate a UAS in the field.

The proficiency course is based on the *National Institute of Standards and Technology (NIST) Guide to Measuring and Comparing UAS Capabilities and Remote Pilot Proficiencies Using Standard Test Methods*.

The course is a required component of the SRFD UAS RPIC Level 1 and Level 2 courses. Minimum passing Scores on all events / exams are 70%.

Note: For information about the course, see Appendix K: Building the UAS Proficiency Course.

15.4 Certification Levels

15.4.1 ORPIC Level 1

RPIC's who qualify for SRFD UAS ORPIC Level 1 have successfully completed all of the requirements listed below and have been certified by a qualified SRFD instructor on a specific aircraft for day missions only.

1. RPIC has a current FAA Part 107 Remote Pilot certificate
2. RPIC has completed the following SRFD UAS ORPIC Level 1 Course ground school topics:
    - Standard Operating Procedures

- Mission Planning
- Case Law

3. RPIC has completed the following SRFD UAS ORPIC Level 1 Course hands-on training:
    - Setup
    - Basic flight maneuvers
    - Using the camera (not thermal or FLIR)
    - Setting flight modes
4. RPIC has completed the following SRFD UAS ORPIC Level 1 Course scenario-based flights:
    - Scenario 1: Search and Identify
    - Scenario 2: Barricaded Suspect
    - Scenario 3: Mapping / Photogrammetry
    - Scenario 4: Overwatch / Indoor
    - Scenario 5: Search and Rescue
5. RPIC has completed the following SRFD UAS ORPIC Level 1 Course proficiency tests based on the National Institute of Standards and Technology (NIST) Guide to Measuring and Comparing sUAS Capabilities and Remote Pilot Proficiencies Using Standard Test Methods:
    - Hold position and altitude
    - Orbit a point
    - Fly straight and level
    - Identify and inspect objects
    - Land accurately

15.4.2 ORPIC Level 2

RPIC's who qualify for SRFD UAS ORPIC Level 2 have successfully completed all of the requirements listed below and have been certified by a qualified SRFD instructor on a specific aircraft for both day and night missions.

1. RPIC has a current FAA Part 107 Remote Pilot certificate
2. RPIC has completed all SRFD UAS ORPIC Level 1 Course requirements
3. RPIC has completed the following SRFD UAS ORPIC Level 2 Course ground school topics:
    - UAS Night Operations
    - How the Eye Works
    - Spatial Disorientation and Visual Illusions
    - Improving Your Night Vision
    - Thermographics
4. RPIC has completed the following SRFD UAS ORPIC Level 2 Course hands-on training:
    - Setup
    - Basic flight maneuvers
    - Using the camera (thermal / FLIR)
    - Setting flight modes
5. RPIC has completed the following SRFD UAS ORPIC Level 2 Course scenario-based flights:
    - Scenario 1: Search and Identify

- Scenario 2: Search and Rescue
- Scenario 3: Track Suspect

6. RPIC has completed the following SRFD UAS ORPIC Level 2 Course proficiency tests based on the National Institute of Standards and Technology (NIST) Guide to Measuring and Comparing sUAS Capabilities and Remote Pilot Proficiencies Using Standard Test Methods:
    - Hold position and altitude
    - Orbit a point
    - Fly straight and level
    - Identify and inspect objects
    - Land accurately

15.4.3 SRFD UAS Visual Observer

A crew member qualifies as a Visual Observer for both day and night missions when they have successfully completed all of the SRFD UAS Visual Observer Course topics listed below and have been certified by a qualified SRFD instructor.

- UAS Operations
- Definitions and Roles
- Understanding Airspace, NOTAMs, and TFRs
- Night Operations
- How the Eye Works
- Spatial Disorientation and Visual Illusions
- Improving Your Night Vision
- The Who, what, and When of Being a VO

15.4 Recertifying

15.4.1 ORPIC Recertification

Each ORPIC certification is valid for one year from date of test, at which time the RPIC must recertify on each aircraft they fly. The recertification is a one-day class that includes ground school and a hands-on flight test.

- Ground school covers rules and regulations that have changed in the past year, as well as new and revised best practices learnt in the field. In addition, the RPIC is required to pass a written test similar to the recurrent Part 107 test that includes questions about airspace, maps, weather, mission planning, FAA rules and regulations, among other topics. Both Level 1 and Level 2 RPIC's complete the test; however, there is an additional section in the test for Level 2 RPIC's to complete that covers night operations.
- The hands-on flight test is scenario-based using one or more of the scenarios in the Level 1 or Level 2 training courses.

A suggested course schedule is shown below; the number of flight slots depends on the number of instructors and students.

With this schedule, you can have both Level 1 and Level 2 RPIC's attend training on the same day. Level 1 RPIC's complete their flight test first and then attend ground school. Level 2 RPIC's attend ground school first and then complete their flight test.

TIME	DESCRIPTION
09h00 – 18h00	Schedule one-hour slots for Level 1 (daytime) flight tests. The RPIC should schedule a separate timeslot for each aircraft on which they want to recertify.
18h00 – 20h00	Ground School for Level 1 and Level 2 RPIC's. 1. Test – 70% min passing grade 2. Information applicable to Level 1 and Level 2 RPIC's. 3. Level 1 RPIC's may leave. 4. Information applicable to Level 2 RPIC's.
20h00 – 23h00	Schedule one-hour slots for Level 2 (nighttime) flight tests.

15.4.2 Visual Observer Recertification

While a Visual Observer is not required to recertify, it is recommended that they attend the SRFD UAS Visual Observer class again if it has been a substantial amount of time since they worked in a Visual Observer role.

15.5 SRFD UAS ORPIC Certification Form

At the completion of the course, the instructor shall complete the relevant SRFD RPIC Missions Qualification Checklist and the SRFD UAS RPIC Certification Form and send a copy of both to the RPIC's department/agency. The RPIC qualifies as a SRFD RPIC as soon as the department/agency endorsing officer signs the form.

> For examples, see Appendix J: Training Form Examples.
>
> The forms are included with the SRFD program.

15.6 Existing Training Program

If you already have an existing training program that meets or exceeds the SRFD program requirements, contact the SRFD Administration to request an audit of your program to have it accepted as an alternate SRFD training program for your agency or District / Department.

Section 16: Administering the SRFD Program at the RDPO COA USERS Level

Use the topics in this section as a guide for administering the SRFD program at the RDPO COA USERS level; managing and supporting the Districts / Departments within the RDPO COA USERS that are using the program.

16.1 SRFD Database (Air Data)

Use a SRFD database to centralize information about the District / Department SRFD programs, UAS crew members, hardware, and software. This is useful for RDPO COA USERS and FAA reporting, as well as for mutual aid deployments when you want to know who to call for flight crews and specialized equipment.

Your database can be a commercial or in-house program, a Microsoft Access database, or a Microsoft spreadsheet. All flights must be submitted to the SRFD / RDPO UAS in the Air Data account.

The database will include information such as:

- SRFD Program Manager (Program POC) contact information
- RDPO COA USERS-level waiver and/or COA information and expiration dates
- SRFD RPIC's
    - Certification level (Level 1 or Level 2)
    - Certification expiration date
    - FAA Part 107 Remote Pilot certificate number and expiration date
- Other Flight Crew Member Details
- Aircraft
    - Aircraft type, registration number, location
    - Camera specifications (Zoom, Thermal, FLIR)
    - Aircraft maintenance schedules
    - Batteries
    - Controllers
- Software
    - Number of users
    - Vender contact information
    - License expiration dates

16.2 Subject Matter Experts / Support Line

It might be helpful to designate a general email account and/or support line that Districts / Departments can contact for questions or advice about their SRFD program.

They may need advice about the type of aircraft to purchase, or where to go for Part 107 training and certification. They may need assistance with understanding a specific FAA rule, or writing a waiver request.

16.3 Waiver and COA Maintenance and Reporting

- All RDPO COA USERS-level waivers need to be renewed periodically
- All RDPO COA USERS-level COA's require monthly reporting 1st day of each month to report previous month's activites.

16.4 Program and Training Documentation

The industry is changing so rapidly, and the FAA laws continue to be updated and changed on a fairly regular basis. In order to ensure that your RPIC's and program continue to meet FAA and state/federal requirements, it is important to keep the program and training documentation up-to-date.

This includes adding and editing information based on new technology and updated/new/changed laws, as well as changes to best practices based on lessons learned in the field. As the policies change, the training curriculum should also be updated to reflect these changes.

You should implement a process to get the updated information out to each District / Department and to answer any questions from instructors.

16.5 Equipment Scheduling and Maintenance

If the RDPO COA USERS owns equipment that is available for training, set up an online (preferably) booking system that Districts / Departments can use to borrow the equipment. When equipment is checked out, a form is completed that notes details of all equipment and if there is any damage to it. When the equipment is returned, if anything is damaged or missing, the District / Department that borrowed the equipment should pay the repair/replacement costs.

16.6 SRFD Program Administrator

The SRFD Program Administrator oversees the SRFD programs at the RDPO COA USERS level. This position has the following responsibilities:

Maintain SRFD Database	Ensure that each District / Department running the program sends in regular reports and they update the database accordingly. For example, adding/removing RPIC's and aircraft, adding/removing programs, sending reminders to Districts / Departments when their RPIC's are nearing recertification deadlines.
Subject Matter Expert	Point person when any of the Districts / Departments have questions or need assistance with anything relating to the SRFD program.
Waiver and COA Maintenance and Reporting	If there are RDPO COA USERS-level waiver's and/or COAs, complete any required reporting, and complete the necessary paperwork for any new waiver's or COAs.
Maintain Program and Training Documentation	Maintain the SRFD Program and Training Guides and update them as needed when laws or best practices change. They make sure that all Districts / Departments receive copies of any updated materials. They work with the Districts / Departments to ensure that instructors are up-to-date with the latest information.
Equipment Scheduling and Maintenance	If the RDPO COA USERS owns training equipment, purchase and maintain the equipment (aircraft, batteries, cables, controllers, and so on). They manage the schedule for Districts / Departments to use the equipment. They manage RDPO COA USERS equipment repairs and purchases.
Software Maintenance	If the RDPO COA USERS provides software for all Districts / Departments to use (for example, DroneSense), manage the licenses.

Appendix A: Flight Checklist Example

Use the information in this section to create a checklist that is relevant to your department / agency.

Preflight

Step 1: At the Office

- ☐ Aircraft documentation
- ☐ NOTAM
- ☐ Local Regulations and permissions
- ☐ Proximity to the airport
- ☐ Weather conditions
- ☐ Batteries charged
- ☐ Flight gear check

Step 2: At the Mission Location

- ☐ Scan ground, sky, take-off, and landing area for obstacles that may interfere with the UAS
- ☐ Wind check
- ☐ Confirm mission flight plan
- ☐ Flight crew briefing (example, flight mission and safety)
- ☐ File daily flight report
- ☐ Assemble UAS
  - ☐ Visual condition inspection of the UAS components such as:
    - Airframe structure and attachment points
    - Moveable control and flight surfaces
    - Propulsion system including powerplants, propellers, motors, ducted fans, and so on.
    - Servo motors including attachment points
  - ☐ Registration displayed and legible
  - ☐ Batteries securely mounted
  - ☐ Equipment (for example, a camera) securely attached
  - ☐ Fuel (correct type and quantity)

Turn on Control Unit and Aircraft (in that order)

- ☐ Verify all systems (for example, aircraft and control unit) have an adequate energy supply for the intended operation and are functioning properly
- ☐ Control unit:
  - ☐ Antennas set to correct orientation
  - ☐ Display panel, if used, is functioning properly
  - ☐ Control link correct functionality is established between the aircraft and the CS
  - ☐ Sensor / Camera setting check

- ☐ Calibrate UAS compass prior to any flight
- ☐ Verify communications with UAS and that the UAS has acquired GPS location from at least 4 satellites
- ☐ Set/Confirm RTH
- ☐ Check flight termination system, if installed
- ☐ Confirm SD card is inserted and formatted

☐ Aircraft:

- ☐ Inspect propellers for any imbalance or irregular operation
- ☐ Final airframe inspection

☐ Check ground support equipment, including takeoff and landing systems, for proper operation

☐ Wind check again for launch

During Flight

Step 3: After Launch

- ☐ Aircraft reached safe altitude
- ☐ Confirm correct movement of control surfaces using the CS
- ☐ Confirm observer has the aircraft in sight
- ☐ All systems green
- ☐ Satellite and GPS check
- ☐ At a controlled altitude, fly within range of any interference and recheck all controls and stability
- ☐ Check remaining battery (regularly throughout flight)

Step 4: Before Landing

- ☐ Ensure UAS flight completed according to mission plan
- ☐ Scan landing area for obstacles
- ☐ Wind check
- ☐ Observer briefing for landing
- ☐ All systems green

Post Flight

Step 5: After Landing

- ☐ Power down UAS
- ☐ Remove and safely store batteries
- ☐ Airframe inspection
- ☐ Check SD card data to confirm data collected
- ☐ Transfer data and flight log
- ☐ If needed, log SD card into evidence
- ☐ Complete logbook entry

Step 6: Back at the Office

- ☐ Flight and maintenance report
- ☐ Charge batteries
- ☐ SD card cleaned and ready to use (unless handed in as evidence)
- ☐ Airframe check
- ☐ Process data

Appendix B: Flight Team Leader (UAS Leader) Checklist Example

Flight Team Leader
Worksheet and Check List

Mission General Information			
Team Leader		Incident Commander	
UAS Channel		Air Traffic Frequency	
Mission Notes:		Manned Air Channel	

Flight Teams					
Call Sign	Pilot	Assigned Area	Assigned Altitude	Mission	Aircraft	Range (Flight Time)

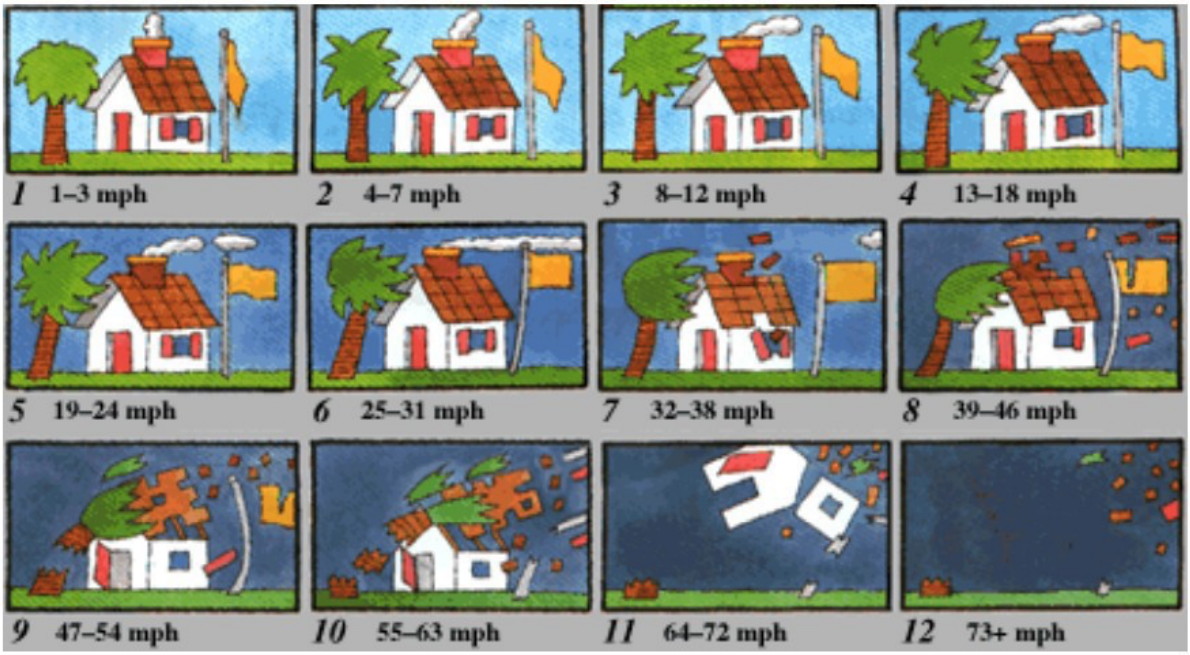
Ready For Operations		
Go For Flight	Items	Notes
Aviation		
☐	Weather	
☐	Air Space	
☐	Wavers	
☐	TFR's	
Systems		
☐	Telemetry Software	
☐	Streaming	
☐	Weather Systems	
☐	Communications	
Personnel		
☐	Incident Commander	
☐	Manned Aircraft	
☐	LZ Manager	
☐	RPIC	
☐	VO	
☐	Other	

Mission Date:

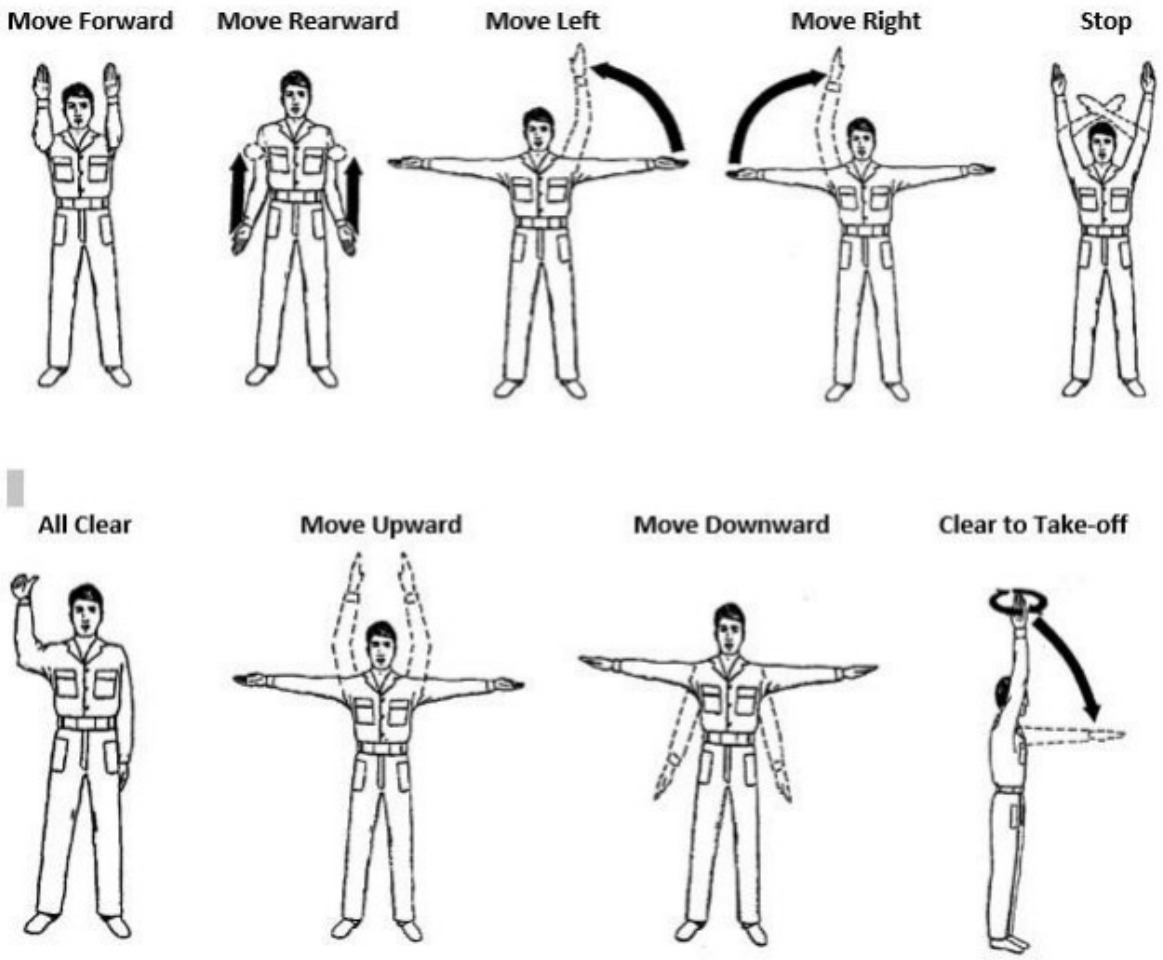
Mission Time:

Appendix C: Beaufort Wind Scale

The Beaufort wind force scale is a measure that relates wind speed to observed conditions at sea or on land.



Appendix D: Flight Hand Signals



(EdgeData, 2016)

Appendix E: Contingency Plan Checklist

Event	Result	Procedure
Battery depletes	Uncrewed aerial system (UAS incapable of continuing flight operations.	UAS return to base (RTB) as soon as practical; cease data collection.
Ditch Procedures	UAS incapable of continuing flight operations.	Identify safe landing area; attempt a controlled landing; if able, land UAS in water (shallow preferred for ease of recovery) away from public.
Fuel Depletes	UAS incapable of continuing flight operations.	UAS RTB as soon as practical; cease data collection.
Hazardous Weather	UAS incapable of continuing flight operations.	UAS RTB as soon as practical; cease data collection.
Hostile Environment	Mission impacted by hazard (for example, air traffic, public activity).	See and avoid; take evasive action as required with safety taking precedence; UAS RTB as soon as practical.
Loss of Communications	Mission impacted by lack of communications hazard.	Maintain visual line of sight (VLOS); take evasive action as required with safety taking precedence; UAS RTB as soon as practical.
Loss of Control Signal	UAS not controllable.	Maintain VLOS; UAS RTB and land without harm to UAS or contacting surrounding objects.
Loss of Direct Visual	UAS could become a hazard if unable to regain visual control.	Regain direct visual of UAS; contact mission payload operator and/or visual observer to determine status.
Loss of GPS Signal	Use extreme caution as the positional data for the UAS will not be accurate.	Assume manual control of the UAS; Maneuver and climb UAS to reacquire GPS signal; if GPS signal cannot be reacquired, determine whether safe UAS control can be maintained. If safe flight cannot be maintained, land as soon as practical.
Loss of Situational Awareness (SA)	UAS could become a hazard if unable to regain SA.	Climb to a safe altitude; reorient with use of sensors; RTB if required.
Privacy Impact	Possible public complaint.	Cease data collection; RTB and complete an assessment.
UAS Failure	UAS incapable of continuing flight operations.	Maintain VLOS; UAS RTB as soon as practical.

Appendix F: Mission Planning Profile

Mission Profile	Location (Name, Latitude, Longitude	Date:		ETD:		ETA:	
		Crew Assigned:					
	Daylight Hours:						

Waypoint	Transit (T) or Hover (H)	Altitude AGL (ft)	Estimated Leg Duration (mm : ss)	Activity

Total Flight Time (TFT)	
Statutory Reserve (SR) (TFT x 0.20*)	
Mission Requirement (TFT + SR)	
Max Load UAS Flight Time	

Notes:

*With respect to TFTs and SRs, a UAS flight should be able to be completed with 20% energy reserves (fuel or battery) remaining or a 5-minute reserve or the manufacturer recommendation, whichever is greater.

Acronyms: ETD = estimated time of departure, ETA = estimated time of arrival, AGL = above ground level

Organizational Point of Contact	Contact Numbers
National grid operations center	
Local electric utility distribution network office	
Service provider local field services office	
County road supervisor	
County sheriff dispatch office	
County fire department	
Closest medical facility	
Internet/phone providers	
Site manager	
Remote Pilot In Command (RPIC)	
Visual observer	
Mission payload operator	
Subject matter expert	

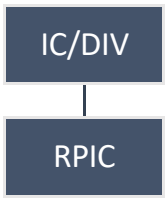
Appendix G: Example of UAS Modules and Packages (ICS Structure)

UAS team positions are designed to expand and contract within ICS. The complexity of the data product, and UAS operations, drive the personnel requirement.

UAS modules may be assembled by ordering single resources and assembling the team on an incident or ordered as a SRFD package (UAS Team Leader, RPIC, Data Specialist, UAS Manager) if available.

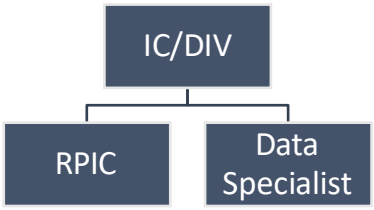
"Alpha - A" Package

Low complexity data product requirement such as Situational Awareness, small scale acre/perimeter calculation, photos/video. The RPIC is trained to independently provide these products.



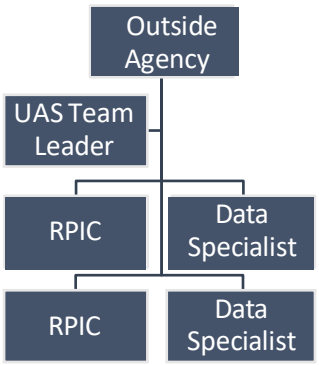
"Bravo - B" package

Moderate complexity data product requirements supporting small incidents (type 3, 4, or 5): In this scenario, the Data Specialist would either produce the desired product or handoff pre-processed sensor/telemetry data to an assigned (or local) specialist.



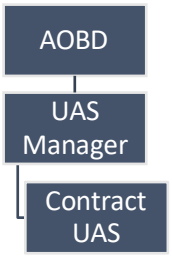
"Charlie - C" package

High complexity data products supporting large incidents: Large/complex incident may require a mix of UAS products or services and multiple UAS personnel. In this case, a leadership position is activated to provide direction to a team of UAS personnel. The organizational structure will vary depending on the section/unit which requires UAS data collection.



"Delta - D" Package

The UAS Manager position is activated when a contract UAS resource is mobilized. This typically occurs in large incidents.



SRFD Mission Ready Package

Resource:	UAS Team		
Resource	Search and Rescue (ESF #9)	**Kind:**	Search
Overall Function:	A team that performs real time UAS aerial reconnaissance to enhance Commands situational awareness.	**Composition & Ordering Specifications:**	1 RPIC 1 UAS Team Leader 1 Data Specialist 1 Visual Observer (if present) 1 UAS Manager (if required) If required, law enforcement support, re-supply and shelter for the team must be provided by the requesting agency.

Capabilities:			**Notes:**
Component:	**Metric and Response Package:**	**Details:**	
Personnel	RPIC **(A,B, C)**	1 SRFD Personnel or equivalent (SRFD qualified)	Should have FAA Part 107 Certification and /or operate under FAA COA
Personnel	Data Specialist **(B, C)**	1 SRFD Personnel or equivalent (SRFD qualified)	See SRFD UAS Positions and Utilization
Personnel	UAS Team Leader **(C)**	1 SRFD Personnel or equivalent (SRFD qualified)	See SRFD UAS Positions and Utilization
Personnel	1 Visual Observer (if present) **(A, B, or C)**	1 SRFD Personnel or equivalent (SRFD qualified)	See SRFD UAS Positions and Utilization
Personnel	1 UAS Manager (if required) **(D)**	1 SRFD Team Personnel or equivalent (SRFD qualified)	See SRFD UAS Positions and Utilization
Vehicles	Transportation	Vehicle(s) capable of driving Code 3 and transporting personnel with equipment.	1 4WD pickup with tow package capable of pulling trailer.

CAPABILITIES:			NOTES:
COMPONENT:	METRIC AND RESPONSE PACKAGE:	DETAILS:	

Equipment	Materials and supplies	Self-sustaining for 24 hours to include personal protective equipment, food and water.
		Med kit -BLS level.
		Discipline specific equipment to accomplish the mission objectives to include:
		• Laptop with wireless internet capability for connectivity
		• Tech bag
		  • Lightning cable (IPad) x 2
		  • Micro SD Cards (64 GB x 2) and carrying case
		  • Micro USB (x1)
		  • HDMI micro adaptor x 1
		  • USB thumb drive for distribution x 4
		  • Portable hard drive (1 TB) x1
		• Cellular Hot Spot
		• Cell Phone
		• Primary Aircraft
		• Secondary Aircraft (if available)
		• Payload
		  • EO Camera
		  • IR Camera (if available)
		• Batteries > 1 hr
		• Extra propellers
		• Software
		  • Mapping / modeling – Pix4D
		  • Management / data communications – DroneSense
		  • Air Data
		• Video monitors (ruggedized if available)
		  • HDMI cords x2
		  • Apple TV (for each monitor)
		• Ipad Pro (one for each aircraft)
		• Sunshade (10' x 10')
		• Generator / Invertor
		  • Fuel
		  • Extension cords x 2
		  • Power strip x 1
		• Battery charging station for each aircraft
		• Portable radios
		  • Motorola 800
		  • BK radio
		  ○ Extra batteries (minimum x 2 each)
		• Portable table with chairs
		• Portable lighting (minimum –one headlamp for each personnel)
		• Landing pad
		• Maintenance kit (tools, zip ties, soldering iron, glue, and so on)	

Appendix H: Oregon and Washington State Laws: Use of Uncrewed Aircraft

Note on Federal vs State Laws:

Federal airspace laws take precedence over state drone laws. If a state or local law directly conflicts with FAA regulations, the state or local law is likely to be invalidated.

Oregon Drone Laws:

Definitions:
"**Uncrewed aircraft system**" means an uncrewed flying machine, commonly known as a drone, and its associated elements, including communication links and the components that control the machine.

Statutes/Bills:
837.310 Restrictions; exceptions.
Except as otherwise provided in ORS 837.310 to 837.345, a law enforcement agency may not operate an uncrewed aircraft system, acquire information through the operation of an uncrewed aircraft system or disclose information acquired through the operation of an uncrewed aircraft system.

Oregon law enforcement may only use a drone under one or more of the following circumstances: they obtain a written warrant that specifies the period of use of the drone which cannot exceed 30 days, they reasonably believe that exigent circumstances exist in the commitment of a crime making it unreasonable to wait for a warrant, they have written consent
from the individual whose property is being searched, they are using the drone solely for training purposes, or if they intend to use the drone to conduct search and rescue operations during a time of emergency.

837.320 Authorized use upon issuance of warrant; exigent circumstances.

1. A law enforcement agency may operate an uncrewed aircraft system, acquire information through the operation of an uncrewed aircraft system, or disclose information acquired through the operation of an uncrewed aircraft system, if:

(a) A warrant is issued authorizing use of an uncrewed aircraft system; or
(b) The law enforcement agency has probable cause to believe that a person has committed a crime, is committing a crime or is about to commit a crime, and exigent circumstances exist that make it unreasonable for the law enforcement agency to obtain a warrant authorizing use of an uncrewed aircraft system.

A warrant authorizing the use of an uncrewed aircraft system must specify the period for which operation of the uncrewed aircraft system is authorized. In no event may a warrant provide for the operation of an uncrewed aircraft system for a period of more than 30 days. Upon motion and good cause shown, a court may renew a warrant after the expiration of the 30-day period. [2013 c.686 §3; 2015 c.315 §3]

837.330 Written consent.
A law enforcement agency may operate an uncrewed aircraft system for the purpose of acquiring information about an individual, or about the individual's property, if the individual has given written consent to the use of an uncrewed aircraft system for those purposes. [2013 c.686 §4; 2015 c.315 §4]

837.335 Search and rescue; use in emergencies.
A law enforcement agency may operate an uncrewed aircraft system for the purpose of search and rescue activities, assisting an individual in an emergency, and during a state of emergency that is declared by the Governor.

837.340 Criminal investigations.
A law enforcement agency may operate an uncrewed aircraft system, acquire information through the operation of an uncrewed aircraft system, or disclose information acquired through the operation of an uncrewed aircraft system, for the purpose of reconstruction of a specific crime scene or accident scene, or similar physical assessment, related to a specific criminal investigation.

837.345 Training.
A law enforcement agency may operate an uncrewed aircraft system for training purposes.

837.360 Restrictions; civil penalties; registration; fees; rules.

1. A public body may not operate an uncrewed aircraft system in the airspace over this state without registering the uncrewed aircraft system with the Oregon Department of Aviation.
2. The Oregon Department of Aviation may impose a civil penalty of up to $10,000 against a public body that violates subsection (1) of this section.
3. Evidence obtained by a public body through the use of an uncrewed aircraft system in violation of subsection (1) of this section is not admissible in any judicial or administrative proceeding and may not be used to establish reasonable suspicion or probable cause to believe that an offense has been committed.
4. The Oregon Department of Aviation shall establish a registry of uncrewed aircraft systems operated by public bodies and may charge a fee sufficient to reimburse the department for the maintenance of the registry.
5. The Oregon Department of Aviation shall require the following information for registration of an uncrewed aircraft system:

(a) The name of the public body that owns or operates the uncrewed aircraft system.
(b) The name and contact information of the individuals who operate the uncrewed aircraft system.
(c) Identifying information for the uncrewed aircraft system as required by the department by rule.
2. A public body that registers one or more uncrewed aircraft systems under this section shall provide an annual report to the Oregon Department of Aviation that:
(a) Summarizes the frequency of use of the uncrewed aircraft systems by the public body during the preceding calendar year;
(b) Summarizes the purposes for which the uncrewed aircraft systems have been used by the public body during the preceding calendar year; and
(c) Indicates how the public can access the policies and procedures established under section 7 of this 2016 Act.
3. The State Aviation Board may adopt all rules necessary for the registration of uncrewed aircraft systems in Oregon that are consistent with federal laws and regulations.
Section 9 of HB4066 said:

1. Section 7 of this 2016 Act and the amendments to ORS 837.360 by section 8 of this 2016 Act become operative on January 1, 2017.
2. A public body may take any action before the operative date specified in subsection (1) of this section that is necessary to enable the public body to exercise, on and after the operative date specified in subsection (1) of this section, all the duties, functions and powers conferred on the public body by section 7 of this 2016 Act and the amendments to ORS 837.360 by section 8 of this 2016 Act.

837.365 Weaponized uncrewed aircraft systems.
A person may not intentionally, knowingly or recklessly operate or cause to be operated an uncrewed aircraft system that is capable of firing a bullet or projectile or otherwise operate or cause to be operated an uncrewed aircraft system in a manner that causes the system to function as a dangerous weapon as defined in ORS 161.015

Violations are either a class B or C felony depending on whether the action resulted in the drone causing physical injury to another person.

Rule does not apply if:

1. The person uses the uncrewed aircraft system to release, discharge, propel or eject a nonlethal projectile

for purposes other than to injure or kill persons or animals;
2. The person uses the uncrewed aircraft system for nonrecreational purposes in compliance with specific authorization from the Federal Aviation Administration;
3. The person notifies the Oregon Department of Aviation, the Oregon State Police and any other agency that issues a permit or license for the activity requiring the use of the uncrewed aircraft system of the time and location at which the person intends to use an uncrewed aircraft system that is capable of releasing, discharging, propelling or ejecting a projectile at least five days before the person uses the system;
4. If the person intends to use an uncrewed aircraft system that is capable of releasing, discharging, propelling or ejecting a projectile in an area open to the public, the person provides reasonable notice to the public of the time and location at which the person intends to use the uncrewed aircraft system; and
5. The person maintains a liability insurance policy in an amount not less than $1 million that covers injury resulting from use of the uncrewed aircraft system.

837.374 Reckless Interference with aircraft.

1. A person commits a Class A violation if the person possesses or controls an uncrewed aircraft system and recklessly causes the uncrewed aircraft system to:
a. Direct a laser at an aircraft while the aircraft is in the air;
b. Crash into an aircraft while the aircraft is in the air; or
c. Prevent the takeoff or landing of an aircraft
2. A person commits a Class A misdemeanor if the person possesses or controls an uncrewed aircraft system and knowingly or intentionally causes the uncrewed aircraft system to:
a. Direct a laser at an aircraft while the aircraft is in the air;
b. Crash into an aircraft while the aircraft is in the air; or
c. Prevent the takeoff or landing of an aircraft.
3. Notwithstanding subsection (1) of this section, a person commits a Class A misdemeanor if the person violates subsection (1) of this section and the person has one or more convictions under subsection (1) of this section at the time of the offense.
4. In addition to and not in lieu of any other sentence the court may impose, upon a person's second or subsequent conviction under this section, the court shall, at the time of sentencing, declare the uncrewed aircraft system used in the offense to be contraband and order that the uncrewed aircraft system be forfeited. [2016 c.72 §5; 2019 c.337 §1]

837.375 Interference with an uncrewed aircraft system; unauthorized control.

In addition to any other remedies allowed by law, a person who intentionally interferes with, or gains unauthorized control over, an uncrewed aircraft system licensed by the Federal Aviation Administration, or operated by the Armed Forces of the United States as defined in ORS 352.313, an agency of the United States or a federal, state or local law enforcement agency, is liable to the owner of the uncrewed aircraft system in an amount of not less than $5,000. The court shall award reasonable attorney fees to a prevailing plaintiff in an action under this section.

837.380 Owners of real property; Attorney General.

Oregon statutes forbid any person from flying a drone over another's property multiple times, as long as the drone has been flown over the property at least once and the property owner notified the drone operator or owner that they did not want the drone flown over property. However,
the property owner has no cause of action if the drone is taking off or landing or is lawfully in the flight path of an airport or runway. If the property owner brings a cause of action and prevails, they may recover treble damages and attorneys' fees.

837.385 Preemption of local laws regulating uncrewed aircraft systems.

Except as expressly authorized by state statute, the authority to regulate the ownership or operation of uncrewed aircraft systems is vested solely in the Legislative Assembly. Except as expressly authorized by state statute, a local government, as defined ORS 174.116, may not enact an ordinance or resolution that regulates the ownership or operation of uncrewed aircraft systems or otherwise engage in the regulation of the ownership or operation of uncrewed aircraft systems.

837.995 Crimes involving uncrewed aircraft systems; penalties.

1. A person commits a Class A felony if the person possesses or controls an uncrewed aircraft system and intentionally causes, or attempts to cause, the uncrewed aircraft system to:

(a) Fire a bullet or other projectile at an aircraft while the aircraft is in the air;
(b) Direct a laser at an aircraft while the aircraft is in the air; or
(c) Crash into an aircraft while the aircraft is in the air.

2. A person who intentionally interferes with, or gains unauthorized control over, an uncrewed aircraft system licensed by the Federal Aviation Administration, or operated by the Armed Forces of the United States as defined in ORS 352.313, an agency of the United States or a federal, state or local law enforcement agency, commits a Class C felony.

HB 4066 Critical Infrastructure Facility (Passed as law but waiting on location to where it is to be added between 837.300-390)

"**Critical infrastructure facility**" means any of the following facilities, if completely enclosed by a fence or other physical barrier that is obviously designed to exclude intruders, or if marked with a sign conspicuously posted on the property that indicates that entry is forbidden:

1. A petroleum or alumina refinery;
2. An electrical power generating facility, substation, switching station or electrical control center;
3. A chemical, polymer or rubber manufacturing facility;
4. A water intake structure, water treatment facility, wastewater treatment plant or pump station;
5. A natural gas compressor station;
6. A liquid natural gas terminal or storage facility;
7. A telecommunications central switching office;
8. A port, railroad switching yard, trucking terminal or other freight transportation facility;
9. A gas processing plant, including a plant used in the processing, treatment or fractionation of natural gas;
10. A transmission facility used by a federally licensed radio or television station;
11. A steelmaking facility that uses an electric arc furnace to make steel;
12. A dam that is classified as a high hazard by the Water Resources Department;
13. Any portion of an aboveground oil, gas or chemical pipeline that is enclosed by a fence or other physical barrier that is obviously designed to exclude intruders; or
14. A correctional facility or law enforcement facility.

A person commits a Class A violation if the person intentionally or knowingly:

1. Operates an uncrewed aircraft system over a critical infrastructure facility at an altitude not higher than 400 feet above ground level; or
2. Allows an uncrewed aircraft system to make contact with a critical infrastructure facility, including any person or object on the premises of or within the facility.

Violations do not apply to:

1. The federal government.
2. A public body.
3. A law enforcement agency.
4. A person under contract with or otherwise acting under the direction or on behalf of the federal government, a public body or a law enforcement agency.
5. An owner or operator of the critical infrastructure facility.
6. A person who has the prior written consent of the owner or operator of the critical infrastructure facility.
7. The owner or occupant of the property on which the critical infrastructure facility is located.
8. A person who has the prior written consent of the owner or occupant of the property on which the critical infrastructure facility is located.
9. A person operating an uncrewed aircraft system for commercial purposes in compliance with authorization granted by the Federal Aviation Administration.

498.128 Use of drones for pursuit of wildlife prohibited

The State Fish and Wildlife Commission shall adopt rules prohibiting the use of drones for the following

purposes related to the pursuit of wildlife:

1. Angling;
2. Hunting;
3. Trapping;
4. Aiding angling, hunting or trapping through the use of drones to harass, track, locate or scout wildlife; and
5. Interfering in the acts of a person who is lawfully angling, hunting or trapping.

Oregon Aviation Regulations Chapter 738
Purpose and Statutory Authority:
To regulate the registration of aircraft and UAS in Oregon
738-080-0015 Definitions
738-080-0020 Exemption from Aircraft and UAS Registration Fee
738-080-0030 Temporary Exemption from Registration of Manned Aircraft
738-080-0045 Public Agency Registration of Uncrewed Aircraft System (UAS)

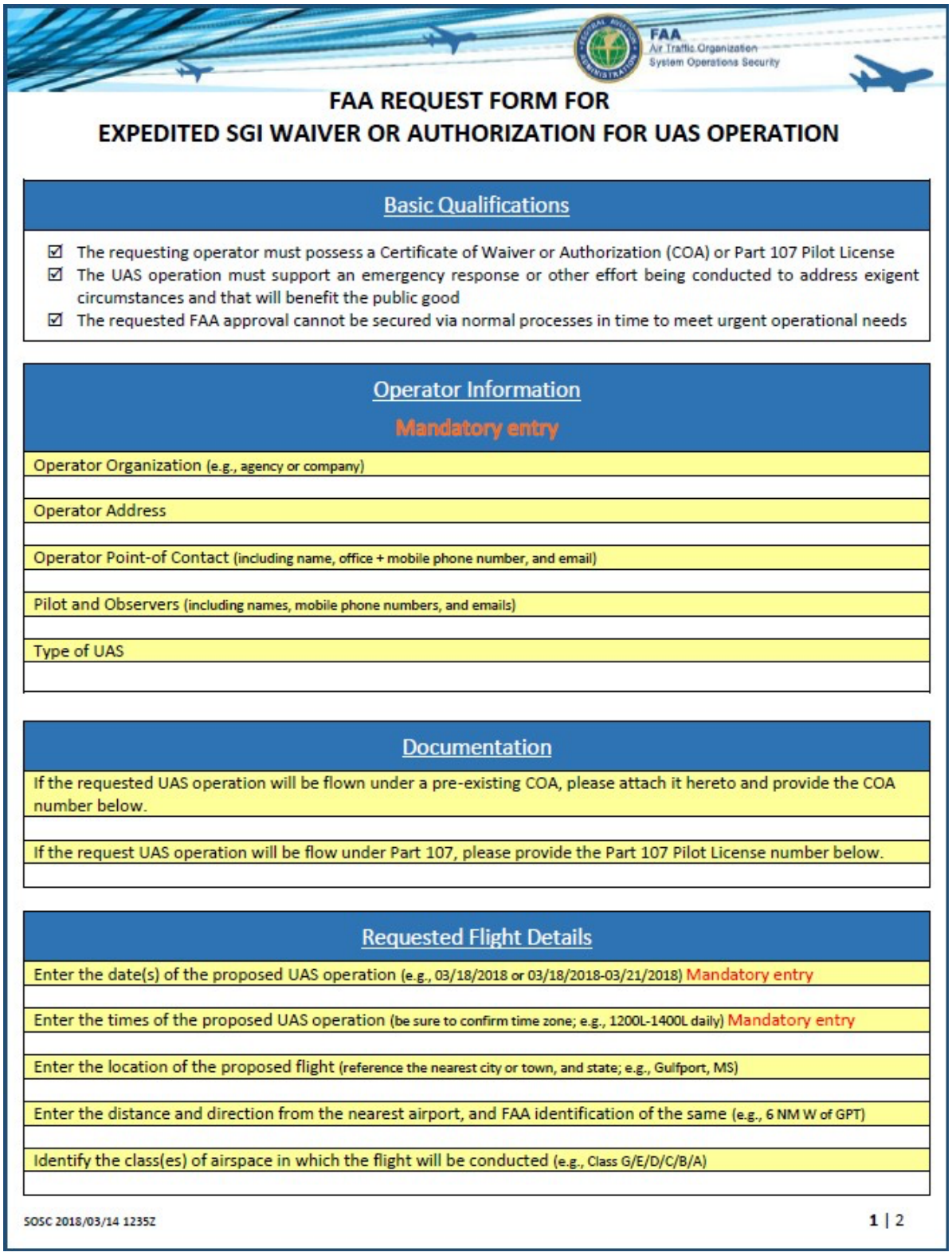
State of Washington Drone Laws:

Note on Federal vs State Laws:
Federal airspace laws take precedence over state drone laws. If a state or local law directly conflicts with FAA regulations, the state or local law is likely to be invalidated.

Definitions:
"**Drones**" should apply to uncrewed aerial vehicles controlled by a remote operator.
Sample definition: "An uncrewed aircraft that is operated without the possibility of direct human intervention from within or on the aircraft."

Statutes/Bills:
WAC 200-250-030 Drone use prohibited; State Capitol Campus
Launching, landing, or operating an uncrewed aircraft from or on lands and waters within the boundaries of the state capitol campus is prohibited except for the exclusions listed under WAC 200-250-040.
The Chief Privacy Officer of the Washington Office of Privacy and Data Protection issued guidelines for uncrewed aircraft systems for policy makers and stakeholders as they develop policy proposals.

Appendix I: Special Government Interest (SGI) Submission Form Example



FAA
Air Traffic Organization
System Operations Security

FAA REQUEST FORM FOR
EXPEDITED SGI WAIVER OR AUTHORIZATION FOR UAS OPERATION

Basic Qualifications
☑ The requesting operator must possess a Certificate of Waiver or Authorization (COA) or Part 107 Pilot License
☑ The UAS operation must support an emergency response or other effort being conducted to address exigent circumstances and that will benefit the public good
☑ The requested FAA approval cannot be secured via normal processes in time to meet urgent operational needs

Operator Information Mandatory entry
Operator Organization (e.g., agency or company)
Operator Address
Operator Point-of Contact (including name, office + mobile phone number, and email)
Pilot and Observers (including names, mobile phone numbers, and emails)
Type of UAS

Documentation
If the requested UAS operation will be flown under a pre-existing COA, please attach it hereto and provide the COA number below.
If the request UAS operation will be flow under Part 107, please provide the Part 107 Pilot License number below.

Requested Flight Details
Enter the date(s) of the proposed UAS operation (e.g., 03/18/2018 or 03/18/2018-03/21/2018) Mandatory entry
Enter the times of the proposed UAS operation (be sure to confirm time zone; e.g., 1200L-1400L daily) Mandatory entry
Enter the location of the proposed flight (reference the nearest city or town, and state; e.g., Gulfport, MS)
Enter the distance and direction from the nearest airport, and FAA identification of the same (e.g., 6 NM W of GPT)
Identify the class(es) of airspace in which the flight will be conducted (e.g., Class G/E/D/C/B/A)

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Requested altitude of UAS flight: Mandatory entry	
Enter GIS details defining location of proposed flight (only one area type description needed) Mandatory entry	
For those flights remaining within a general contiguous area, which can be described as a circular polygon, provide the latitude and longitude, expressed as degrees/minutes/seconds, of the center of that area and the radius of that same area (e.g., XX:XX:XXN / XXX:XX:XXW - .25NM radius)	
For those flights remaining within a general contiguous area, which cannot be easily described as a circular polygon, provide the latitude and longitude, expressed as degrees/minutes/seconds, of the vertices of the general area starting with the most northerly point and then progressing clockwise (e.g., (XX:XX:XXN / XXX:XX:XXW; XX:XX:XXN / XXX:XX:XXW; XX:XX:XXN / XXX:XX:XXW)	
For those flights following an extended route, provide the latitude and longitude, expressed as degrees/minutes/seconds, of the key waypoints of the route, and, as appropriate provide the width of the route (e.g., XX:XX:XXN / XXX:XX:XXW; XX:XX:XXN / XXX:XX:XXW ; XX:XX:XXN / XXX:XX:XXW ; XX:XX:XXN / XXX:XX:XXW - .25NM wide)	

Nature and Description of Event

Enter the type of urgent UAS operation to be flown		Description of event
☐	Firefighting Law Enforcement Search and Rescue	
☐	Local / National / Natural Disaster	
☐	Other (specify below)	

Additional Pilot Qualifications

Enter additional pilot qualifications	
☐	Sport/Recreational/Private pilot certificate
☐	Commercial/Airline pilot certificate
☐	Flight instructor certificate

Contacting the SOSC

The SOSC office and email are staffed/monitored 0600-2400 Eastern Time. For all emergencies, please follow up any email with a phone call to 202-267-8276, which is answered 24/7.

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Appendix J: Training Form Examples

SRFD UAS ORPIC Level 1 Checklist

SRFD UAS ORPIC LEVEL 1 CHECKLIST

INITIAL / RECURRENT
☐ INITIAL ☐ RECURRENT

TESTING INFORMATION			
TEST DATE		TEST LOCATION	

RPIC INFORMATION			
RPIC NAME		DEPARTMENT / AGENCY	
107 CERTIFICATE #		EMAIL	

AIRCRAFT INFORMATION			
UAS TYPE		REGISTRATION #	
CONTROLLER TYPE		DISPLAY TYPE	
SOFTWARE PLATFORM			

GROUND SCHOOL	PASS
STANDARD OPERATING PROCEDURES	
MISSION PLANNING	
TEXAS GOVERNMENT CODES	
CASE LAW	

HANDS-ON BASIC PROFICIENCY	PASS
SETUP	
BASIC FLIGHT MANEUVERS	
USING THE CAMERA	
SETTING FLIGHT MODES	

SCENARIO-BASED FLIGHTS	PASS
SCENARIO 1: SEARCH AND IDENTIFY	
SCENARIO 2: PERS. SITUATIONAL AWARENESS	
SCENARIO 3: MAPPING / PHOTOGRAMMETRY	
SCENARIO 4: OVERWATCH / INDOOR	
SCENARIO 5: SEARCH AND RESCUE	

PROFICIENCY TESTING	PASS
POSITION MANEUVERING 1	
POSITION MANEUVERING 2	

INSTRUCTOR INFORMATION			
INSTRUCTOR NAME		DEPARTMENT / AGENCY	
INSTRUCTOR TITLE		INSTRUCTOR EMAIL	

INSTRUCTOR SIGNATURE _____ RPIC SIGNATURE _____ DATE _____

SRFD UAS ORPIC Level 2 Checklist

SRFD UAS ORPIC LEVEL 2 CHECKLIST

INITIAL / RECURRENT
☐ INITIAL ☐ RECURRENT

TESTING INFORMATION			
TEST DATE		TEST LOCATION	

RPIC INFORMATION			
RPIC NAME		DEPARTMENT / AGENCY	
107 CERTIFICATE #		EMAIL	

AIRCRAFT INFORMATION			
UAS TYPE		REGISTRATION #	
CONTROLLER TYPE		DISPLAY TYPE	
SOFTWARE PLATFORM			

GROUND SCHOOL	PASS
UAS NIGHT OPERATIONS	
HOW THE EYE WORKS	
SPATIAL DISORIENTATION / VISUAL ILLUSIONS	
IMPROVING YOUR NIGHT VISION	
THERMOGRAPHICS	

HANDS-ON BASIC PROFICIENCY	PASS
SETUP	
BASIC FLIGHT MANEUVERS	
USING THE CAMERA	
SETTING FLIGHT MODES	

SCENARIO-BASED FLIGHTS	PASS
SCENARIO 1: SEARCH AND IDENTIFY	
SCENARIO 2: SEARCH AND RESCUE	
SCENARIO 3: TRACK SUSPECT	

PROFICIENCY TESTING	PASS
POSITION MANEUVERING 1	
POSITION MANEUVERING 2	

INSTRUCTOR INFORMATION			
INSTRUCTOR NAME		DEPARTMENT / AGENCY	
INSTRUCTOR TITLE		INSTRUCTOR EMAIL	

INSTRUCTOR SIGNATURE _____ RPIC SIGNATURE _____ DATE _____

SRFD UAS ORPIC Certification Form

SRFD UAS ORPIC CERTIFICATION FORM

QUALIFICATION LEVEL		INITIAL / RECURRENT	
☐ LEVEL 1 RPIC	☐ LEVEL 2 RPIC	☐ INITIAL	☐ RECURRENT

TESTING INFORMATION			
TEST DATE		TEST LOCATION	

RPIC INFORMATION			
RPIC NAME		DEPARTMENT / AGENCY	
107 CERTIFICATE #		EMAIL	

AIRCRAFT INFORMATION			
UAS TYPE		REGISTRATION #	
CONTROLLER TYPE		DISPLAY TYPE	
SOFTWARE PLATFORM			

INSTRUCTOR INFORMATION			
INSTRUCTOR NAME		DEPARTMENT / AGENCY	
INSTRUCTOR TITLE		INSTRUCTOR EMAIL	

INSTRUCTOR SIGNATURE	RPIC SIGNATURE	DATE

DEPARTMENT/AGENCY ENDORSEMENT

I certify that the above RPIC has successfully met all requirements for the safe operation of the listed aircraft, and may operate as a department/agency PSURT RPIC at the indicated qualification level for one year from test date.

ENDORSING OFFICER NAME	ENDORSING OFFICER SIGNATURE	DATE

*** THIS CERTIFICATION IS VALID FOR ONE YEAR FROM TEST DATE ***

SRFD UAS RPIC/VO Night Mission Pre-Flight Quiz

PSURT UAS RPIC/VO NIGHT MISSION PRE-FLIGHT QUIZ

RPIC NAME _____

DATE _____

LOCATION _____

1. ☐ True / False: Autokinesis is caused by staring at single points of light for more than a few seconds. The lights then appear to move even if the aircraft is not moving.

2. ☐ Correction of Autokinesis can be done by which of the following?
   A. Focusing eyes at varying distances
   B. Increasing speed of visual scanning
   C. Increasing your eye rate of blinking
   D. A and B only

3. ☐ True / False: Reversible Perspective Illusion occurs when an aircraft may look like it's moving away from you, but it's actually moving towards you.

4. ☐ Reversible Perspective Illusion can be eliminated by which of the following?
   A. Comparing the possible moving light to a fixed light on the surface.
   B. Reversible Perspective Illusion cannot be corrected so the mission must be terminated
   C. Looking away from the aircraft lights to regain night vision
   D. None of the above

5. ☐ True / False: Size and Distance Illusion occurs when a light is slowly pulsing, creating a false impression of approaching or receding aircraft.

6. ☐ True / False: Fascination is becoming fixated on one particular subject and not paying attention to surroundings.

7. ☐ What do you lose when you are exposed to excessively bright light?
   A. Contrast discrimination
   B. Depth perception
   C. Visual reaction time
   D. All of the above

8. ☐ True / False: Flicker Vertigo is when the lighting cycle causes nausea or dizziness.

9. ☐ Which of the following may be other issues that can affect the flight team during night operations?
   A. Loss of night vision
   B. Inability to focus on a subject
   C. Dehydration
   D. All of the above are concerns for night operations

10. ☐ True / False: Rest and Nutrition can improve your night vision.

SRFD UAS Visual Observer Checklist

RDPO / SRFD VISUAL OBSERVER CHECKLIST

RDPO

TESTING INFORMATION			
TEST DATE		TEST LOCATION	

VO INFORMATION			
VO NAME		DEPARTMENT / AGENCY	
TITLE		EMAIL	

VO COURSE TOPICS	PASS
UAS OPERATIONS	
DEFINITIONS AND ROLES	
UNDERSTANDING AIRSPACE,NOTAM'S AND TFR'S	
NIGHT OPERATIONS	
HOW THE EYE WORKS	
SPATIAL DISORIENTATIONAND VISUAL ILLUSIONS	
IMPROVING YOUR NIGHT VISION	
THE WHO, WHAT, AND WHEN OF BEING A VO	
FINAL QUIZ	

INSTRUCTOR INFORMATION			
INSTRUCTOR NAME		DEPARTMENT / AGENCY	
INSTRUCTOR TITLE		INST. EMAIL	

SRFD UAS Visual Observer Night Preflight Form

RDPO / SRFD RPIC/VO NIGHT MISSION PRE-FLIGHT QUIZ

RDPO

RPIC NAME _____ **V**

LOCATION _____

Please circle your answers below. Only one selection per question.

1 True / False: Autokinesis is caused by staring at single points of light for more than a few seconds. The lights then appear to move even if the aircraft is not moving.

2 Correction of Autokinesis can be done by which of the following?

- A. Focusing eyes at varying distances
- B. Increasing speed of visual scanning
- C. Increasing your eye rate and blinking
- D. A and B only

3 True / False: Reversible Perspective Illusion occurs when an aircraft may look like it's moving away from you, but it is actually moving towards you.

4 Reversible Perspective Illusion can be eliminated by which of the following?

- A. Comparing the possible moving light to a fixed light on the surface
- B. Reversible Perspective Illusion cannot be corrected so the mission must be terminated
- C. Looking away from the aircraft lights to regain night vision
- D. None of the above

5 True / False: Size and Distance Illusion occurs when a light is slowly pulsing, creating a false impression of approaching or receding aircraft.

6 True / False: Fascination is becoming fixated on one particular subject and not paying attention to surroundings.

7 What do you lose when you are exposed to excessively bright light?

- A. Contrast discrimination
- B. Depth perception
- C. Visual reaction time
- D. All of the above

8 True / False: Flicker Vertigo is when the lighting cycle causes nausea or dizziness.

9 Which of the following may be other issues that can affect the flight team during operations?

- A. Loss of night vision
- B. Inability to focus on a subject
- C. Dehydration
- D. All of the above are concerns for night operations

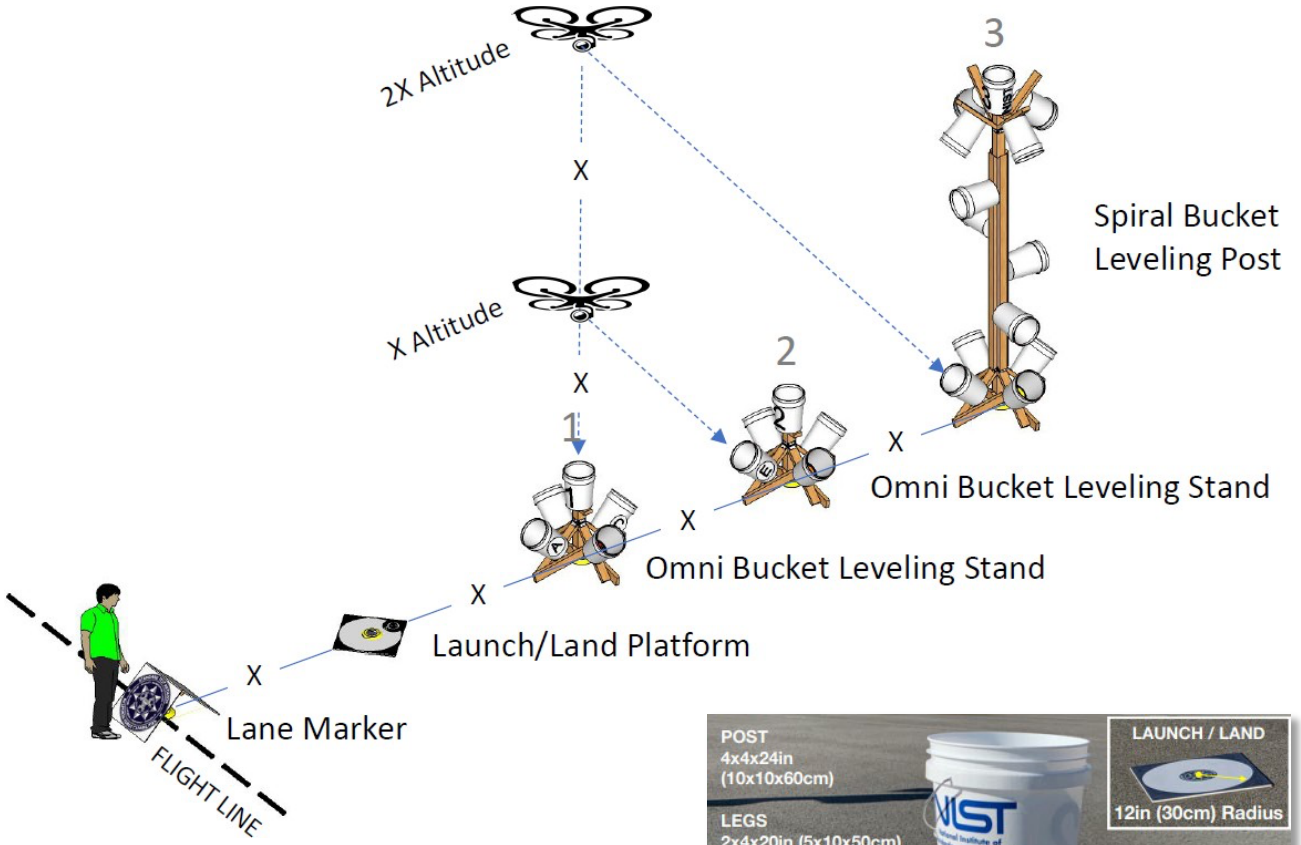
10 True / False: Rest and Nutrition can improve your night vision.

SRFD UAS Course Evaluation Form

Appendix K: Building the UAS Proficiency Course

The proficiency course is based on the *National Institute of Standards and Technology (NIST) Guide to Measuring and Comparing UAS Capabilities and Remote Pilot Proficiencies Using Standard Test Methods*.

For information about the NIST course, and for detailed setup steps, including printable stickers, see the *NIST Standard Test Methods for sUAS_v20190905.pdf* that is included with this program.



Setup Options

Depending on the tests that you want to use, there are two options for building your test lane:

- Two Omni bucket levelling stands + one Spiral bucket leveling post, or
- Three Omni bucket levelling stands

Lane Features

- Pilot flight line for safety (A-frame as lane marker).
- Centerline using 100ft (30m) measuring tape.

- Launch/Land platform to measure accuracy.
- Bucket stands with vertical and angled white buckets that can be stowed and transported
- Optional outriggers that enable bucket stands to be leveled on uneven terrain
- Apparatus spacing is 10ft (3m)
- Flight altitudes are 10ft (3m) and 20ft (6m)
- Overall length is 50ft (15m)

Supplies

3 bucket stands and 1 launch/land platform panel.

Note: The supplies listed below are for three of the short stands. They do not include the spiral bucket leveling post (tall stand).

Quantity	Item
3	4x4x24in posts
12	2x4x20in legs, 45deg cuts both ends opposing
3	2x4x12in T-tops
12	2x2x24in or 2x4x24in outriggers (uneven terrain)
100	3-1/in washer head screws to secure lumber joints
15	Bolts with wing nuts to secure buckets, allowing buckets to be easily removed
15	2 or 5 gallon white buckets
1	Launch/Land platform panel with 12in radius circle
1	100ft measuring tape as center line
1	Post level to measure vertical
1	Thick black marker to inscribe 1in (25mm) rings inside buckets and write letters inside and out. Or 8in (200mm) round white polyester weatherproof labels can be printed from the QUICK START GUIDE downloadable from www.RobotTestMethods.nist.gov Aerial Systems web page.

Note: For night missions, in addition to the standard course setup, you will need to either strap inward-facing lights to each bucket or put a hand-warmer inside each bucket for thermal flights.

Appendix L: Privacy Policy

I. Purpose Statement

The SRFD deployment and use of remotely operated rescue UAS are not intended for intelligence gathering although may be used by the Incident Command in the investigative purposes such as the prosecution of crimes. The deployment and use of SRFD UAS for a law enforcement or criminal intelligence gathering purpose other than an arson investigation (a suspicious activity that has a potential terrorist or criminal nexus or is relevant to the investigation and prosecution of suspected criminal activity, the justice system response, and the prevention of crime or is useful in crime analysis or in the administration of justice and public safety) must be approved by the SRFD members department prior to operations.

Possible scenarios that may benefit from the deployment of UAS are as followed but not limited to:

- High-Rise Fires
- Search and Rescue
- Hazardous Materials Mitigation
- Flood Events
- Wildfires
- Commercial and Residential Fires
- Post-Fire Investigations (including arson investigations)
- Pre-Fire Planning
- Scene Mapping

The purpose of this Privacy Policy is to ensure that safeguards and sanctions are in place to protect the privacy, civil rights, and civil liberties of all individuals, and other protected interests, including those of organizational entities, as well as to protect the integrity of SRFD Members department. It is also the purpose of this Policy to ensure the accuracy of information and compliance with applicable law as information is developed, collected, exchanged, stored, and released.

II. Definitions

UAS	Uncrewed aircraft system and all of the associated support equipment, control station, data links, telemetry, communications, and navigation equipment, and so on, necessary to operate the uncrewed aircraft (Federal Aviation Administration (FAA)).
First Responder	Those individuals who, in the early stages of an incident, are responsible for the protection and preservation of life, property, evidence, and the environment, including emergency response providers as defined in section 2 of the Homeland Security Act of 2002 (6 U.S.C. 101)(includes Federal, State, and local governmental and nongovernmental emergency

public safety, fire, law enforcement, emergency response, emergency medical (including hospital emergency facilities), and related personnel, agencies, and authorities), as well as emergency management, public health, clinical care, public works, and other skilled support personnel (such as equipment operators) that provide immediate support services during prevention, response, and recovery operations.

Information Digital imagery (may include data in other mediums) recorded or transmitted by a UAS. Digital imagery may include data about people, organizations, events, incidents, or objects.

Law As used in this policy, includes any applicable local, state, tribal, territorial, or federal statute, ordinance, regulation, executive order, policy, or court rule, decision, or order, as construed by appropriate local, state, tribal, territorial, or federal officials or agencies.

Need to Know This is established when, as a result of District / Departmental, organizational, or operational necessities, access to sensitive information is necessary for the conduct of an individual's official duties as part of an organization that has a right to know the information in the performance of a first responder, homeland security, or counter-terrorism activity.

Public Includes:

- Any person and any for-profit or nonprofit entity, organization, or association;
- Any governmental entity for which there is no existing specific law authorizing access to this information;
- Media organizations; and
- Entities that seek, receive, or disseminate information for whatever reason, regardless of whether it is done with the intent of making a profit, and without distinction as to the nature or intent of those requesting information.

Does not include:

- People or entities, private or governmental, who have the legal authority to assist in emergency operations requested by an Authority Having District / Department (SRFD) during an emergency or disaster event, and
- Public agencies whose authority to access information gathered and retained by the SRFD is specified in the law.

Right to Know This is established when, based on having legal authority or responsibility, or pursuant to an authorized agreement, an agency or organization is authorized to access sensitive information in the performance of a first responder, homeland security, or counter-terrorism activity.

III. Policy Applicability and Legal Compliance

The SRFD shall make this policy available to the public through available resources.

All personnel who provide services through the SRFD or have access to information garnered by the SRFD shall be provided with an electronic copy of this policy and the SRFD Data Image Storage Policy. Personnel will be required to provide a written acknowledgment of receipt of these policies and agree to comply with their applicable terms and conditions. Such acknowledgments will be maintained by the Professional Standards Office of the SRFD.

All SRFD personnel with access to SRFD information shall operate in compliance with applicable law protecting privacy, civil rights, and civil liberties, including, but not limited to the U.S. and state law.

The SRFD has adopted internal operating policies that comply with the applicable lawS and this policy.

IV. Governance and Oversight

Responsibility for the operation of the SRFD member is assigned to the head of SRFD member's Department Head or her/his designee.

The SRFD member's Department Head or her / his designee shall:

- Resolve conflicts or disputes that might arise related to policy or mission;
- Establish a protocol concerning the treatment of violations of this Agreement;
- Control the dissemination of any information produced by the SRFD member, including specific alerts and bulletins to agencies inside and outside the region;
- Review and update this Privacy Policy annually, as needed, taking into consideration recommendations by the SRFD, other interested parties, and changes in applicable law;

The SRFD will appoint a UAS Coordinator, who will be responsible for the day-to-day operations of the UAS Program. The UAS Coordinator will establish needed procedures, practices, and protocols as well as use advanced software, information technology tools, and physical security measures to ensure information is accessed only by authorized personnel and are protected from unauthorized access, modification, theft or sabotage, whether internal or external, or disasters or intrusions by natural or human causes.

All allegations of a violation of this Privacy Policy shall be referred to and investigated by the SRFD member's department.

Individual users of the SRFD information remain responsible for the lawful and appropriate use of that information. Failure to abide by the restrictions and use limitations of that information may result in the suspension or termination of individual user privileges, disciplinary sanctions, or criminal prosecution.

V. Collection Limitations

All information will be obtained lawfully and can only be used for a business-related purpose. When applicable, information that has law enforcement or criminal intelligence value to local law enforcement shall be collected in strict compliance with the Fourth Amendment of the United States Constitution and all other applicable federal, state, or local laws.

The SRFD will not use nor allow its UAS to be deployed based upon religious, political, or social views or activities; participation in a particular organization or event; or race, color, national original, age, disability, sex, sexual identity, sexual orientation, or any other status protected under local, state, or federal law.

Upon receipt of information collected by the SRFD, SRFD personnel shall assess the information to determine or review its nature, usability, and quality (when applicable, Law Enforcement will have access to this information to determine its evidentiary value).

At the time the decision is made by the SRFD to retain information, it will be labeled to the maximum extent feasible, pursuant to applicable limitations on access and sensitivity of disclosure to:

- Not interfere with or compromise pending criminal investigations; and
- Protect an individual's right to privacy, or their civil rights and liberties.

All labels assigned to existing information will be re-evaluated at such times when new information is added that has an impact on access limitations or the sensitivity of disclosure of the information, or there is a change in the use of the information affecting access or disclosure limitations such as a change in case status.

All information related to an investigation conducted must be maintained pursuant to existing policies and procedures of the SRFD member's department.

These safeguards are intended to ensure that information that could violate civil rights and civil liberties will not be gathered, documented, processed, and shared either intentionally or inadvertently.

The SRFD member will keep a record of all information collected by a UAS.

VI. Information Sharing

Except as provided herein, information sharing is the responsibility of the SRFD member gathering the data/images. Each individual user obtaining information will be required to acknowledge, in writing, that he/she remains solely responsible for the interpretation, further dissemination, and use of the information, and is responsible for ensuring that any information relied upon is accurate, current, valid, and complete, especially before any official action is taken in full or partial reliance upon the information obtained.

SRFD information will not be shared with other individuals or agencies unless there is a need and right to know the information in the performance of a public safety, law enforcement, homeland security, or public health activity. Documentation of the transference of information will be accounted for by the SRFD member responsible for transferring the data/images.

Information released by the SRFD member to another agency will be governed by the laws and rules governing the individual agencies in respect to such data, as well as by applicable law:

- Requests from a law enforcement agency, including information that is not related to an imminent threat to public safety, will not be released except upon the receipt of a subpoena or court order, and only after review by the SRFD member's department.
- Information gathered by UAS not related to an imminent threat to public safety and has an incidental/unintended law enforcement or criminal intelligence gathering value will not be released except upon the receipt of a subpoena or court order, and only after review by SRFD member's department.

VII. Record Retention

All SRFD digital imagery shall be retained for a period that is consistent with the SRFD member's record management ordinance/policy, and any applicable Records Retention Schedule including the State of Texas State Library and Archives Commission Retention Schedule for Records of Public Safety Agencies.

Given that there is no are existing records retention period applicable to data obtained from a UAS, it's advised that UAS digital imagery for a period of ninety (90) days from the date the data was captured, except when the data is the subject of a pending Public Information Act request, or has evidentiary value in any pending or potential administrative, civil, criminal, or other legal proceeding When the records are related to a pending criminal investigation, the records retention period shall be that which applies to criminal investigation records.

VIII. Dissemination of Information

SRFD UAS information will only be provided to authorized personnel. Unauthorized access or use of gathered SRFD data/images is prohibited. Unauthorized posting, transmission, or other release or dissemination of SRFD information is strictly prohibited without the permission of the Incident Commander, her/his designee, or the SRFD member's Department Head. The Incident Commander, her/his designee, or the SRFD member's Department Head reserves the right to restrict personnel from access to SRFD information and to suspend or withhold the access rights of any individual violating this Privacy Policy. The Incident Commander, her/his designee, or the SRFD member's Department Head shall be notified of any individual's restriction or suspension of access to SRFD information. Any use of the SRFD UAS information in an unauthorized or illegal manner will subject the individual user to denial of further use or access, disciplinary action, and/or criminal prosecution.

Information obtained from or through the use of UAS through the SRFD will not be used or publicly disclosed for purposes other than as specified in this Privacy Policy. Information cannot be: (1) sold, published, exchanged, or disclosed for commercial purposes; (2) disclosed or published without prior approval of the Incident Commander, her/his designee, or the SRFD member's Department Head RED Team Director; (3) disseminated to unauthorized persons; or (4) used in any way that is otherwise inconsistent with the statutes, rules, policies, or procedures that govern the members of the SRFD by their department.

Information that would interfere with or compromise pending criminal investigations shall not be disseminated publicly unless required by law and only after consultation with the City of Austin Law Department.

IX. Public Information Requests

Public information requests will be submitted to the Incident Commander, her/his designee, or the SRFD member's Department Head. Requests for all other information maintained by the SRFD member shall be handled in accordance with the procedures and legal requirements established under the Texas Public Information Act, Chapter 552 of the Government Code.

X. Security Safeguards

The SRFD Coordinator will also serve as the SRFD security officer. The security officer shall document and report internal and external breaches of security and violations of policy to the Incident Commander, her/his designee, or the SRFD member's Department Head.

Access to SRFD information will be allowed only over secure networks or via external media devices as appropriate (for example, flash drives).

The SRFD will store information in a manner such that it cannot be added to, modified, accessed, destroyed, or purged except by personnel authorized to take such actions.

Except as provided herein, access to SRFD information will be granted only to the Incident Commander, her/his designee, the SRFD member, and the SRFD member's Department Head whose positions and job duties require such access, and who have been selected, approved and trained accordingly.

The SRFD member will document trails of requested and disseminated information.

When information has been breached or obtained by an unauthorized person and the release of such information may threaten physical, reputational, or financial harm to an individual or agency, the SRFD coordinator shall promptly notify the individual or agency, unless doing so would compromise an ongoing public safety operation or pending criminal investigation.

XI. Compliance, Accountability, and Enforcement

It is the intent of the SRFD to be open with the public concerning the use of UAS by the SRFD when such openness will not jeopardize ongoing emergency response.

The SRFD member or other authorized users shall report violations or suspected violations of this Policy to the SRFD coordinator within 24 hours of occurrence. The Incident Commander, her/his designee, or the SRFD member's Department Head shall be responsible for investigating all complaints of violating this Policy and shall report its findings to the appropriate personnel.

Appendix M: Continuing Education

Purpose Statement

We highly recommend that members not only continue through the more advanced phases of the SRFD program but also consider training outside the group. Associations and organizations are another great source for training and updated information relating to public safety UAS.

Training Resources

Pilots Institute

The Pilot Institute was created to help people achieve their dreams of flight. They host several courses in Uncrewed Systems. Courses include:

- TRUST
- Part 107
- Thermography
- Mapping

Pix4D

Pix4D offers free courses in a self-study format to help pilots become more familiar with their software. In addition, Pix4D offers a certification on their products, available by submitting a project and taking a written exam.

Associations

AUVSI

The Association for Uncrewed Vehicle Systems International (AUVSI), the world's largest nonprofit organization dedicated to the advancement of uncrewed systems and robotics, represents corporations and professionals from more than 60 countries involved in industry, government and academia. AUVSI members work in the defense, civil and commercial markets.

Airborne Public Safety Association

APSA's mission is to support, promote and advance the safe and effective utilization of aircraft by governmental agencies in support of public safety missions through training, networking, advocacy and educational programs.

Law Enforcement Drone Association

LEDA is a group focused on training, learning, and the advancement of UAS technology in policing for training, learning, and the advancement of UAS technology in policing.

Public Safety Flight Association

The Public Safety Flight website is dedicated to news, information, tips, and stories about the use of uncrewed aircraft systems (UAS), UAVs, aircraft, and drones in the fire service and other public safety niches.

Appendix N: Suggested Safety Equipment Checklist

Minimum Equipment List (MEL)

This equipment is in addition to department uniform, basic responder equipment, and specific UAS Kits.

- ☐ Dispatch Radios
- ☐ Air Band Radios
- ☐ Traffic Cones
- ☐ Safety Vests (Pilot ID Vests)
- ☐ First Aid Kit including Tourniquet
- ☐ Lighting Kit (Red/Blue or UV Light Bars for Aircraft)
- ☐ Hydration Pack with Water and Snacks
- ☐ Binoculars
- ☐ Portable Wind Gauge
- ☐ Spare Radio Batteries
- ☐ Spare Connection Cables
- ☐ Flashlight
- ☐ Hat
- ☐ Sunscreen
- ☐ Insect Spray

Appendix O: SRFD Mishap guide:

SRFD Aviation Mishap Response Guide
UAS INCURSION

A UAS incursion is defined as a non-participating UAS operating over or near an incident that intrudes into a TFR or interferes with fire management efforts. The incursion is documented through the appropriate reporting system such as SAFECOM and dispatch incursion form.

Time	Action	Contact and Phone	Time Log
Immediately upon sight and/or notification of incursion	• Notify ATGS, aircraft in the area, and ground personnel. • Clear the affected airspace and suspend air operations in area. • Notify flight following contact, AOBD, and/or dispatch as required. • Request Law Enforcement or Counter UAS Team (cUAS) • Wait for the non-participating UAS to be identified, located, stopped and/or voluntarily depart area.		
After non-participating UAS departs	• Resume air operations. • Complete UAS Incursion Form • Dispatch centers should report UAS incursions to the nearest Air Traffic Control Center • File a SAFECOM		
Notifications	Incident • Notify IC, Agency Head and RDPO UAS Coordinator *Note:* Additional FAA guidance for law enforcement personnel can be found at: https://www.faa.gov/uas/resources/policy_library/media/FAA_UAS-PO_LEA_Guidance.pdf.		

UAS FLYAWAY

Approved UAS have built in failsafe systems. The aircraft will return to home to the identified launch and recovery zone in the event of low battery voltage or loss of link with the GCS. However, in a flyaway situation, the pre-set link procedures are not established or are not being executed by the unmanned aircraft, creating an emergency situation.

Time	Action	Contact and Phone	Time Log
Immediately after lost link	• Notify ATGS, aircraft in the area, and ground personnel. • Clear the affected airspace and suspend air operations in area. • Notify flight following contact, AOBD, and/or dispatch as required. • Wait for the duration of the fuel/battery load.		
After fuel and battery load has passed	• Resume air operations. • Search for the missing UAS. • Follow established mishap reporting procedures based on damage and/or injury (See notifications below)		
Notifications	Minimal damage to UAS and/or payload • Notify IC, Agency Head and RDPO UAS Coordinator Total system loss of UAS and/or payloads (***Not*** *FAA reportable*) • Notify IC, Agency Head and RDPO UAS Coordinator Damage to personnel or property in addition to the UAS and payload (*FAA reportable*) • Notify IC, Agency Head and RDPO UAS Coordinator		

UAS MISHAP/ACCIDENT

If the incident aircraft was operational at the time of a mishap, at least one of the following criteria represent trigger(s) for a mandatory notification to the RDPO UAS Program Lead:
• Operations over people
• Death or Loss of Consciousness*
• $500.00 collateral damage (non-UAV)*
• 300 pound UAV or greater*

NTSB/FAA Reportable
A UAS accident is defined by the National Travel Safety Board (NTSB) as an occurrence associated with the operation of any public or civil UAS that takes place between the time that the system is activated with the purpose of flight and the time that the system is deactivated at the conclusion of its mission, in which any person suffers death or serious injury, or the UAS has a maximum gross takeoff weight of 300 pounds or greater and sustains substantial damage. In the case of a midair collision between a manned aircraft and a UAS that weighs less than 300 pounds in which no injuries were sustained, consideration should be given to the damage incurred to the manned aircraft to determine if the criteria for substantial damage to the manned aircraft has been met.

Time	Action	Contact and Phone	Time Log
Immediately at time of UAS mishap	• Notify IC or aviation designee, aircraft in the area, and ground personnel if applicable. • Notify flight following contact, and/or dispatch as required.		
30 minutes	• Search and recover missing UAS. Do no delay notifications for search and recovery operations. • Follow established mishap reporting procedures based on damage and/or injury (See below) • Complete Aircraft Accident Checklist Do not delay notification if you do not have all the blocks filled. Provide as much information as you can and follow-up when additional info is available		
Notifications	Minimal damage to UAS and/or payload • Notify IC, Agency Head and RDPO UAS Coordinator Total system loss of UAS and/or payloads (***Not*** *FAA reportable*) • Notify IC, Agency Head and RDPO UAS Coordinator Damage to personnel or property in addition to the UAS and payload (*FAA reportable*) • Notify IC, Agency Head and RDPO UAS Coordinator		
NTSB/FAA Reportable UAS Accident	• UAS Mishap Investigation Authorization (required) • Aviation Mishap Investigation UAS Notification (Required) • UAS Mishap Investigation Report (required) • SAFECOM (required) • UAS Mishap Investigation Board (optional) *Note:* Any UAS mishap may be investigated at the discretion of the RDPO UAS Program Manager.		

AIRCRAFT CONFLICT INITIAL REPORT *(UAS Intrusion)*

(Complete known information below. Attach additional narrative sheet if necessary.)

Date/Time:	**Submitted By:** *Name/Position* _____ **Phone:** _____ **Email:** _____

REPORTING PARTY (RP) INFORMATION: *(if different from above)*

RP Location was ☐ Airborne ☐ Ground **Estimated Dist. from RP to Observed Aircraft:** _____

RP Location during observation: *(Geographic Landmark, Incident Division, Latitude-Longitude, etc.)*

TYPE OF CONFLICT or OBSERVATION *(Check one or more as applicable):*

☐ Aircraft in general vicinity ☐ Near Mid-Air Collision ☐ In Military SUA or MTR ☐ TFR Intrusion ☐ Other:

Estimated separation distance between aircraft:

AIRCRAFT INFORMATION: **Observed Aircraft was operated by:** ☐ Military ☐ Civilian ☐ unknown

Category: ☐ UAS ☐ Airplane ☐ Helicopter ☐ Ultralight ☐ Hang glider/Paraglider ☐ Other _____

***If a fixed wing/airplane*:** ☐ High-Wing ☐ Low-Wing ☐ Biplane ☐ Twin-tail booms ☐ V-tail ☐ Other ☐ unknown

Engine Configuration: *(Number and type of engines/rotors, Jet vs. Prop, etc.)*

_____

Landing Gear: ☐ Fixed (Tricycle or Tailwheel) ☐ Retractable ☐ Floatplane ☐ Other ☐ unknown

Paint Colors or Distinct Markings: *(Include N #, if known)*

_____

Make/Model (if known): _____ **Approx. Altitude:** _____ **AGL**

Observed Activity: ☐ straight/level ☐ circling ☐ erratic maneuvering ☐ hover/slow flight

NARRATIVE:	**If TFR Intrusion, was FAA notified?** ☐ Yes ☐ No	**Was a SAFECOM submitted?** ☐ Yes ☐ No (to be filed)

SUPPLEMENTAL INFORMATION FOR UAS INTRUSION

Type of UAS if known: ☐ Fixed-Wing ☐ Helicopter ☐ Quad Copter ☐ Other	**Approx. size of UAS:**	**Types of Agency Aircraft Flying:** ☐ Rotor-Wing ☐ Fixed-Wing ☐ None	**Were Agency Aircraft Grounded?** ☐ Yes ☐ No	**Types of operations impacted:**