

	<b>SAN MARCOS POLICE DEPARTMENT</b>	
	<b>Policy 7.18 Drones</b>	
	<b>Effective Date:</b> November 20, 2018	<b>Replaces:</b>
	<b>Approved:</b> _____ <i>[Signature]</i> _____ <b>Chief of</b> Police	
<b>Reference:</b>		

**I. POLICY**

The deployment of small Unmanned Aircraft Systems (sUAS) by the San Marcos Police Department is expected to assist as a force multiplier, providing increased situational awareness, improve cost-operating efficiency, and enhanced officer and public safety. Deployments of this technology will be in direct support of critical incidents, crime scene and vehicular accident forensics collection, tactical operations, officer training, direct or indirect Fire Department assistance, disaster response and any other mission requiring aerial overview within a Defined Incident Perimeter (DIP).

This policy establishes sUAS program management, operational requirements, reporting and records management, and safety considerations necessary to support law enforcement officers conducting missions as permitted by the Federal Aviation Administration (FAA) issued Certificate of Waiver / Authorization (COA) and/or civil/commercial operations under 14 CFR part 107. sUAS program guidance is designed to minimize risk to people, property and other aircraft while continuing to safeguard the right to privacy by all persons. Further, this policy is designed to comply with all applicable federal, state and local statutes.

As with all investigative methods, the sUAS must be operated consistent with the U.S. Constitution. Accordingly, all San Marcos Police Department (T) program personnel shall abide by the Fourth Amendment and protect citizens from unreasonable searches and seizures. The sUAS shall never be used solely for the purpose of monitoring activities protected by the First Amendment or the lawful exercise of other rights secured by the Constitution and laws of the United States except as necessary to protect people who are exercising their constitutional rights. Agency personnel must be trained on, and abide by, all applicable federal, state and local legal standards, and Department guidance applicable to the deployment and use of this technology. Finally, sUAS shall only be deployed in connection with properly authorized investigations and emergency response activities, and shall only be deployed within the context of existing and applicable federal, state and local laws/regulations, and agency safeguards.

The use of sUAS by the San Marcos Police Department is expected to enhance officer situational awareness and improve response and investigation activities. sUAS operations may be integrated with manned aircraft operations if it provides a most effective response to specific situations.

**II. PURPOSE**

This guidance will ensure law enforcement, public safety and national security missions while ensuring an appropriate level of program management, accountability and transparency. This guidance does not replace the Federal Aviation Administration (FAA) rules and regulations that govern sUAS deployments and help to ensure the safe operation of all aircraft. The San Marcos

Police Department has unique mission characteristics and challenges in serving the citizens of San Marcos. Accordingly, this guidance is merely to foster standardized and comprehensive program management, operations and safety.

### III. DEFINITIONS

- A. Airworthiness: A condition in which the small Unmanned Aircraft System (sUAS) (including the aircraft, airframe, engine, propeller, accessories, firmware, software and control station elements) conforms to its design intent and is determined to be in condition for safe flight operation.
- B. Avionics: Consists of the complete electronics hardware and software for command and control of the small Unmanned Aircraft (sUA) (i.e., Global Positioning System (GPS), battery(s) to power sUA motors and electronic systems, radio elements with antennas, etc.)
- C. Beyond Visual Line-of-Sight, BVLOS: Operation of the sUAS when the Remote Pilot-in-Command (RPIC) or Visual Observer(s) (VOs) responsible for controlling the trajectory of the sUA cannot maintain direct visual contact with the sUA unaided other than by corrective lenses (spectacles or contact lenses), sunglasses or both.
- D. Certificate of Waiver/Authorization (COA): Certificate of Waiver/Authorization issued by the Federal Aviation Administration that permits public agencies and organizations to operate a particular aircraft for a particular purpose in a particular area or waives specific requirements for operations.
- E. 14 CFR Part 107: The FAA regulation that governs routine civil operation, to include public safety, of sUAS in the National Airspace System (NAS), and provides safety rules for those operations. The rule defines sUAS as unmanned aircraft weighing less than 55 pounds.
- F. Concept of Operations (CONOPS): An agency promulgated document that describes systems characteristics, limitations and agency organization, and is used to communicate specific mission(s), operational procedures, and operational objectives and controls for deployment of a proposed sUAS.
- G. Defined Incident Perimeter (DIP): The location in which sUAS operations will be constrained during a specific mission. The maximum operating height of the mission will be in accordance with the altitude limit of the COA or as regulated by 14 CFR Part 107, depending on what authority the operation is being flown.
- H. Extended Visual Line-of-Sight (EVLOS): The operation of a sUA when the Remote Pilot-in-Command (RPIC) or any Visual Observer (VO) cannot maintain visual contact with the sUA for see and avoid practices, but where the location of the sUA is known through technological means; however, the individual responsible for see and avoid shall be able to see other aircraft, terrain, obstacles, or combinations thereof so that the sUAS can be maneuvered clear of a collision. Either the RPIC or, alternatively, the VO can determine the location of the sUAS relative to intruding aircraft, obstacles, structures or terrain and determine that the sUAS does not endanger the life or property of another.
- I. Fly-Away: Sudden unexpected, unplanned, unintended sUAS flight in altitude/airspeed/lateral limits as the result of a failure of the navigation control element or onboard systems, or both.

- J. Ground Control Station (GCS): The interface between the Remote Pilot-in-Command (RPIC) and the sUAS. This may be a handheld control box, a laptop computer, or other device with all associated hardware, power, antennas, cabling, etc.
- K. Hazard: A discovered or foreseeable potentially unsafe condition resulting from failures, malfunctions, external events, errors, conditions or combinations thereof that are considered to have a dangerous impact on the safe operation of the sUAS.
- L. Nonparticipant: Any individual in the vicinity of sUAS operations who is not participating or directly supporting the specific sUAS mission. (Note: a person who is the subject of the UAS mission is not considered to be a nonparticipant).
- M. Operational Risk Assessment (ORA) as it relates to sUAS operations: An evaluation of the operational area, the sUAS and its operation during the intended mission to determine potential risks to persons and property and identify reasonable mitigation strategies to reduce those risks through training, operating procedures or limitations.
- N. Operational Risk Management (ORM): The continual process of evaluating the effectiveness of program controls, which includes risk assessment, risk decision making, and implementation of risk controls to ensure operations satisfy an acceptable level of risk.
- O. Payload: Any sensors, equipment, and/or device attached to or carried by the sUAS for the purpose of collecting data, or otherwise essential to the mission.
- P. Pilot at Controls (PAC): The person who is directly controlling the sUAS under the direct supervision of a certificated Remote Pilot-in-Command (RPIC).
- Q. Post-flight Inspection: Conducted by the RPIC to ensure that the sUAS has not suffered any damage or mechanical issues after the mission is completed. NOTE: All preflight and post-flight forms should be filled out and signed by the RPIC and submitted to the team leader for recordkeeping.
- R. Preflight Briefing: A discussion conducted by the RPIC prior to aircraft launch which should include, but not be limited to, the following:
  1. Review of the mission, mission area (Defined Incident Perimeter), mission objectives and any issues of concern.
  2. Review of current and forecasted weather conditions and weather limitations.
  3. Review of operating limitations and safety issues such as battery charge, GPS strength and potential for radio interference.
  4. Review of crew coordination and communications procedures, (flight crew and on-scene commander).
  5. Review of emergency/contingency procedures including aircraft system failure, flight termination, divert and lost link procedures.
  6. Review of image collection and documentation as determined by the mission.
  7. Execution of all checklists.
- S. Preflight Inspection: Conducted by the RPIC to ensure the sUAS is operational and ready for flight. Also ensures that the control unit is charged and operating appropriately.
- T. Reasonable Expectation of Privacy: An element of law that determines in which places and in which activities a person has a legal right to privacy. Reasonable expectation refers to a person's belief that they are in a place where their activities are protected from being discovered or known, such as in their domicile.

- U. Remote Pilot-in-Command (RPIC): The person who is qualified and designated by The Department, and is directly responsible for and is the final authority to the operation of the sUAS (as described by Federal Aviation Regulations (14 CFR Part 107). The RPIC will also hold, and have in his/her possession, the appropriate FAA sUAS airman certificate for the conduct of the flight.
- V. Risk: The composite of predicted likelihood and severity of the potential effect of a hazard.
- W. Safety Officer: The Safety Officer is responsible for assisting the RPIC with safety-related issues and providing support to the RPIC during sUAS operations. The Safety Officer will act as the liaison officer for coordination with the incident commander, on scene commander or special response personnel on behalf of the RPIC.
- X. “Shall” versus “Should” versus “May”: Within this program guidance, the use of the word “SHALL” describes a practice or procedure or statement that is MANDATORY and must be complied with. “Shall” statements are requirements that will include sufficient detail needed to define compliance. “SHOULD” implies a recommended practice or procedure to comply with as guidance toward the overall goal of improving safety. “MAY” implies an optional procedure or practice where compliance is at the discretion of the individual and are provided to clarify acceptability of a specific item or practice and offer options for satisfying requirements.
- Y. Small Unmanned Aircraft (sUA): A small unmanned aircraft weighing 0.55 pounds or has a maximum takeoff weight (aircraft and payload) less than 55 lb. (25 kg).
- Z. Small Unmanned Aircraft System (sUAS): A small unmanned aircraft (sUA) and all of its associated elements, accessories, etc. (i.e., telemetry links, payload elements and control interfaces (Ground Control Station, antennas, avionics equipment, etc.)) that are required for the safe and efficient operation of the sUA in the national airspace system.
- AA. sUAS Flight Crewmember: A remote pilot, visual observer, payload operator and/or any other designated person assigned duties for sUAS operations.
- BB. sUAS In-Flight Emergency (IFE): An event or emerging circumstance in which the safety of the aircraft, persons or property on the ground is endangered for any reason. Typically, this situation is one in which it is no longer possible to continue the flight using normal procedures. Emergency situations involving a sUAS may develop as a result of one or more factors within or outside the sUAS, for example:
  1. Fire on board the aircraft.
  2. Aircraft component failure or malfunction (e.g., engine failure, navigation or flight guidance system malfunction).
  3. Shortage of battery power or fuel.
  4. Remote Pilot and Visual Observer have lost visual contact with the sUA.
  5. Worsening weather.
  6. Pilot incapacitation (e.g., as a result of illness).
  7. sUAS damage (e.g., as a result of collision, bird strike or extreme weather)
  8. Illegal activity (e.g., willful damage, spoofing or hijacking, etc.).

An emergency or abnormal situation may result in the sUAS aborting the mission to the destination as planned due to one or more of the following outcomes:

  9. Loss of altitude.
  10. Fly Away.

11. Loss of Command and Control of the sUA (lost link).
  12. Diversion to a planned or unplanned emergency landing zone or divert location.
  13. Forced landing.
- CC. sUAS Team Leader: This individual is responsible for sUAS program management and retains full oversight responsibility of all logistical and administrative elements of sUAS operations for the Department. This includes, but is not limited to, ensuring that any person that operates the sUAS, or has a responsibility within the sUAS operation, is properly trained and designated for whatever roles they may fulfill.
- DD. Visual Line-of-Sight (VLOS): The ability of the RPIC and/or Visual Observer(s) (VO) to see and determine the trajectory of the sUAS throughout the entire flight with vision that is unaided other than by corrective lenses, sunglasses or both, and determine the sUAS movement relative to intruding aircraft, obstacles, terrain and observe the airspace for other air traffic or hazards so that the sUAS does not endanger the life or property of another.
- EE. Visual Observer (VO): A person who is designated by the Department and/or RPIC, to assist the RPIC or PAC to maintain VLOS with the sUAS.

#### **IV. ACCOUNTABILITY**

The San Marcos Police Department promotes accountability by requiring all personnel to accept responsibility for the decisions and actions they undertake, and to evaluate the potential consequences of those decisions and actions. The Department imposes codes of conduct to guide its employees in the use of all investigative methods, including sUAS operations. As with the use of any technology, there must be policies and guidance for utilization and oversight, along with procedures to hold the Department and its employees accountable. The Chief of Police or designee is ultimately responsible for activities and performance of agency employees, as well as the operation of a sUAS and its program management.

Part of accountability is ensuring that personnel are appropriately trained and supervised. Department personnel whose responsibility it is to manage, supervise, maintain, fly and/or otherwise use sUAS must receive training on this policy and the underlying policies incorporated within the sUAS program.

Approval authority for the deployment of a sUAS in support of a Department mission will be set at an appropriate and consistent level across the Chief of Police's Office. At a minimum, each time a sUAS is deployed, approval should be granted by the on-scene incident commander, or supervisor on scene. Notifications, when practical, should be made to the sUAS program's supervisor or a sUAS team leader. Additionally, since the Department may only deploy a sUAS in connection with authorized investigations, crisis response activities or routine events (i.e., training, etc.), supervisors must ensure that the underlying investigations themselves, or the crisis response or training activity, has been authorized consistent with applicable guidelines and other policies. In certain instances, sUAS deployment will occur in response to a developing emerging emergency event and in those cases, prudent judgment must be exercised by the on-scene incident commander, or supervisor present, or team leader, and the appropriate supervisor notified immediately. In no case will a sUAS be flown without specific notification and authorization from the appropriate chain of command. All sUAS operations shall be recorded and all records retained in accordance with

standing agency policy if the mission has evidentiary value or as determined by the on-scene incident commander or supervisor.

## **V. CONCEPT OF OPERATIONS (CONOPS)**

The Department's sUAS Concept of Operations (CONOPS) is a broad description of operations, or series of operations, and is designed to provide an overall description of the planned or anticipated employment of the sUAS to support agency missions. The sUAS CONOPS is to enhance the mission effectiveness, provide tactical aerial support, provide real-time situational awareness upon which risk-based decisions may be executed, capture incident-related imagery related to the crisis response or investigation, and generally assist on scene assets in the execution of their various roles during any emergency response event, or high threat situations where the operating environment may be hazardous to officers and the public. The deployment of this technology may also be provided to support forensic data collection in support of any investigation.

All sUAS deployments should be authorized by appropriate chain of command and conducted within an authorized training location or Defined Incident Perimeter controlled by appropriate public safety representatives.

## **VI. sUAS SYSTEM REQUIREMENTS (Procurement Considerations)**

In order to meet the expected CONOPS for the Department, any sUAS system that may be procured must meet basic mission capabilities. Some general sUAS capabilities and system considerations should include, but not be limited to, the following:

- A. The sUAS vendor should provide appropriate system operating and maintenance manuals as well as training and technical support, if available.
- B. The sUAS should be contained and transported within an appropriate case to prevent damage.
- C. The sUAS should include the ability for an integrated image (still and video camera) system (electro-optical high-definition and infrared selectable camera systems preferred).
- D. The sUAS should be able to be transported, set up and launched by one officer. The setup and preflight should not be complicated or overly cumbersome. The time from setup to preflight to launch should not be extensive (optimum would be less than 10 minutes).
- E. The sUAS should have the ability to capture flight time by individual flight, as well as a cumulative flight time over a certain period. The ability to reset the flight time counter should be restricted to a program supervisor or administrator.

## **VII. STANDARD OPERATIONS PROCEDURES**

- A. System Storage
  1. The sUAS and all support equipment, (e.g., spare parts, battery chargers, folding tables and chairs, radio equipment, etc.) will be securely stored and maintained in an appropriate location for timely portability and deployment. Consideration should be given to the storage and transport of sUAS batteries. Transporting Lithium ion batteries via agency vehicles or aircraft, commercial aircraft and express cargo will be done in a manner that is consistent with manufacturer's recommendations. A Department program team member will be assigned to oversee all sUAS equipment and will ensure

said equipment is labeled (FAA registered as required), inventoried, and inspected annually.

B. System Transportation

1. The sUAS system should be stored in a rigid case(s) that can be easily carried and will protect the contents from damage during transport. The sUAS may be transported via Department vehicles, employee personally owned vehicles with supervisor approval, aircraft or any other method with supervisory approval.
2. Prior to transporting the sUAS for deployment, the crew member(s) responsible for transport will ensure that all necessary equipment is loaded by referring to the approved sUAS Equipment Checklist (Appendix A).

C. Mission Readiness

All of the policies and procedures within this operating doctrine shall be complied with in order to ensure that sUAS operations remain fully mission ready. The following standard operations address most, but not all, of the operational protocols for safe sUAS deployments:

1. All training missions will be conducted in a safe manner at a safe or approved location. Any demonstration flights must be approved by the chain of command with justification and location of the flight to include risk assessment. All flight operations should be conducted in accordance with the manufacturer's recommendations, Department policies and procedures.
2. Only personnel, both pilots and crewmembers, who have been trained and certified in the operation of the system, will operate Department sUAS(s).
3. All flights, flight times, and team members will be properly documented on a dedicated form (Flight Tracking Form) or sUAS Mission Tracking Software designed for that purpose.
4. All flight times will be documented in 15-minute intervals. For example: 9 minutes of flight will be logged as 0.25 hours.
5. The program manager or designee will be assigned to conduct periodic audits of all documentation related to the program (FTF, Maintenance Action Form (MAF), Mishap Forms, Training records, logbooks, etc.) quarterly, but not less than annually. The results of the audit will be documented. Any changes to the flight time counter will be documented.
6. Whenever there are specific and articulable grounds to believe that sUAS operations may collect evidence of criminal wrongdoing, and if the sUAS will intrude upon reasonable expectations of privacy, a search warrant may be required prior to conducting the flight.
7. Prior to takeoff, the sUAS should be programmed to direct it to return to the launch point (Return to Home function) if the Command and Control (C2) signal is lost for any period of time. In the event of a C2 interruption (loss of link) with the sUAS, lost link procedures should be executed with the immediate landing of the sUAS.
8. When the sUAS is deployed to meet an approved mission task, it should be recovered within the same general area, if possible.
9. A designated safe area should be maintained during takeoff and landing for all personnel in and around the area with the exception of the sUAS flight crew.

10. sUAS operations will be conducted during daylight hours unless night operations are approved in the COA or authorized under a waiver for 14 CFR Part 107 operations. If exigent circumstances exist, night operations are necessary (and the mission is approved by the appropriate chain of command (incident commander or supervisor or team leader)), the RPIC should contact the FAA System Operations Support Center (SOSC) to request a Special Government Interest (SGI) approval in the event of a COA not being on hand.
11. The RPIC shall make every effort to ensure that flight operations will not pose any undue risk to the personnel directly involved with the mission. The RPIC is the FINAL AUTHORITY concerning the safety and flight of the sUAS. The RPIC shall have final determination of risk to the public and authority over any launch of the aircraft. In all cases, the sUAS should not be flown over nonparticipants (with the exception of those nonparticipants who are the subject of the mission) and/or property in a manner that is in violation of the FAA regulations and/or the approved COA.
12. If, at any time, the RPIC and/or the Observer(s) believe there is a potential for air-to-air conflict, collision, risk of harm/injury to persons or property, the RPIC should abort the flight and immediately land the sUAS. When the hazard has been resolved/mitigated, the flight operation may resume.
13. Any sUAS operations expected to be conducted within any controlled airspace, or in close proximity of an airport, should be coordinated with the applicable airport tower, and/or FAA approval through the provisions of the COA or through coordination with the FAA System Operations Support Center.
14. sUAS flight operations should not be flown within unsafe distances to any building, structure, tower or person, except when the risk of collision and/or loss of the sUAS is outweighed by the need to obtain critical information.
15. Weather is a critical factor for safe sUAS operations. A local source of weather may be utilized via the Internet, cellular phone application, or may be observed onsite based upon previous training and experience. The sUAS should not be flown outside the approved/authorized weather minimums identified by the manufacturer or the restrictions of 14 CFR part 107, or the FAA approved COA. The RPIC shall have final determination of risk due to weather and authority over any mission.
16. Unauthorized use of a Department sUAS could result in disciplinary action.

#### D. Flight Operations

##### 1. Normal Procedures

###### a. Preflight

A preflight check of the sUAS utilizing the checklists will be completed prior to flight and should incorporate the manufacturer's recommendation and applicable Federal Aviation Regulations (FARs). The RPIC shall conduct a preflight crew briefing before every mission to ensure duties, responsibilities, mission objectives, hazards, weather and any information deemed necessary is clearly conveyed to the sUAS team (see FAA AC 107-2).

###### b. Communications

All radio communications required by the FAA will be complied with. Communications between the sUAS team members and the incident commander during the mission will be limited to operationally necessary in order to minimize disruptions or distractions of the RPIC and team members. Federal Communications Commission (FCC) ground station licenses may be required by the FCC for state and local agencies and authorizations may be required from the National Telecommunications & Information Administration (NTIA) for federal agencies.

c. Sterile Cockpit or UAS Operations Area

As with commercial aviation, all sUAS operations will maintain a sterile cockpit, or environment, free from all unnecessary outside distractions. To alleviate mission distraction, all external communications will be halted until after flight operations have been terminated. During all phases of flight, the UAS crew must focus on the safety of the UAS, crew, and mission requirements. Any interruptions during flight operations may decrease the effectiveness of the crew, crew coordination, crew communication, UAS support equipment or flight time, or a loss of mission objectives.

2. General Procedures

- a. The sUAS should be operated in accordance within manufacturer specifications and applicable FAA limitations and restrictions.
- b. Care shall be taken in the operation of the sUAS to avoid overflying persons and property that could result in injury or damage whenever possible.
- c. A copy of the current valid COA, if the operation is under the COA, shall be present whenever sUAS operations are conducted. All personnel shall ensure that a copy of the COA, and 14 CFR Part 107 certificate if applicable, are available prior to commencing flight operations.
- d. The lost link response should be set to the home point and the altitude set in accordance with the altitude limit of the COA or as regulated by 14 CFR Part 107, depending on what authority the operation is being flown.
- e. For all operations, the observer shall utilize a distance from the sUAS that will adequately permit them to maintain a visual observation on the sUAS and maintain officer safety at all times.
- f. All sUAS team members shall comply with all limitations, restrictions and requirements as enumerated in the COA or as directed by 14 CFR Part 107. The RPIC will function as team leader and the operator of the sUAS. The RPIC is ultimately responsible for the sUAS operation, safety of the mission, and is solely responsible for the input of commands/piloting of the sUAS during flight with or without a PAC.
- g. The RPIC shall be responsible for the system assembly, setup, preflight, operations, post-flight, disassembly, storage, debrief and paperwork for every mission. Additionally, the designated VO(s) and other personnel as assigned can assist the RPIC in all of these activities.

- h. The RPIC shall be responsible for contacting the FAA in order to publish the applicable Notice to Airmen (NOTAM) or Temporary Flight Restrictions (TFR) prior to the mission if required.
- i. An Air Band radio (VHF radio) should be part of the sUAS crewmember kit in order to communicate with or monitor the local controlling Air Traffic Authority, or other aircraft if operating nearby an active departure or arrival facility. Additionally, the ability to communicate with low flying first responder helicopters for airspace de-confliction will be increasingly important as sUAS presence will continue to increase at crisis sites.
- j. The sUAS should operate with position navigation or anti-collision lights during night time hours.
- k. The RPIC shall obtain and record the most up-to-date weather forecast for the area of operation.
- l. The RPIC shall conduct a pre-mission briefing to ensure all crewmembers and supporting personnel are fully informed about all aspects of the mission to include, but not limited to, the purpose of the mission, the Defined Incident Perimeter, the weather, any flight hazards or other safety issues and any special coordination concerns.
- m. All sUAS operations should be conducted at less than 400 feet Above Ground Level (AGL) or within the limitations of the COA.
- n. The operating guidelines related to ambient temperature are stated in the manufacturer's flight operations handbook. The battery and flight duration may be adversely affected when high ambient temperatures exist. Expected flight times should be adjusted accordingly based on high humidity and temperature.
- o. The sUAS should not be operated in sustained winds greater than the manufacturer's recommendations. The RPIC may decide that wind conditions in the operation area are too hazardous and opt not to fly.

### 3. Post-flight

A post-flight check of the sUAS will be completed in accordance with the manufacturer's recommendation and applicable Federal Aviation Regulations utilizing the Post-flight Checklist (Appendix A). The sUAS shall then be prepared for redeployment or for disassembly and storage. Prior to placing the UAS into storage, a complete inspection and wipe-down of the UAS and associated equipment will be performed. Any debris such as dirt, dust, water can cause early component failure and/or with catastrophic events. At any time the sUAS is operated within a fire scene (extinguished or active), the UAS will be thoroughly inspected between flights and a complete wipe-down of the UAS and associated equipment will be performed.

### E. Emergency Procedures

Emergency procedures are typically stated in the manufacturer's flight operations manual. They may be detailed or very brief. In any case, the manufacturer's specified emergency procedures should be complied with for all sUAS operations. Any abnormal flight characteristics or unresolved situations observed by the RPIC, and not listed below, that

affect the sUAS operations/mission shall cause the RPIC to immediately bring the sUAS back to the launch/recovery site. Common emergencies are:

1. LOSS OF FLIGHT CONTROL (Lost Link), Return to Home (RTH)
  - a. The sUAS lost link procedures should be set to enable the sUAS to climb to its programmed maximum ceiling altitude and then return to and land at the launch site. The initial procedure in any loss of link condition is to verify the status of power on the sUAS, GCS, and to adjust the antennas in order to get an optimum line of site to the sUAS.
  - b. If positive control of the sUAS cannot be re-established and it is leaving the area of operation (Defined Incident Perimeter) in a Fly Away condition, or the sUAS poses a risk to life and/or property, the RPIC will issue an Engine Kill command (if a feature of the sUAS). If this should occur, immediately notify the local ATO facility providing the location and circumstances, last known direction of flight and altitude and the registration number. The RPIC will then immediately inform the chain of command providing all details needed and complete the appropriate incident form.
2. LOSS OF VISUAL CONTACT
  - a. If visual contact with the sUAS is lost during any mission, the RPIC should command the aircraft into a hover mode and the RPIC and VO shall try to re-establish visual contact. If visual contact cannot be re-established within a reasonable amount of time, as determined by the RPIC, then the RPIC shall execute the emergency lost link procedures (RTH) in an attempt to reacquire visual contact. If the RPIC and VO are unable to visually reacquire the sUAS, the flight should be terminated, and the Lost Link procedures shall be filed. The RPIC should complete the appropriate incident form for the termination of the flight.
3. LOSS OF GPS SIGNAL
  - a. Should the sUAS lose the GPS signal during autonomous operations, the RPIC must immediately take manual command of the sUAS and land as soon as practical. If positive control of the sUAS cannot be maintained and the sUAS is leaving the operational area, or the sUAS poses a risk to life and/or property, the RPIC will issue an Engine Kill command. If the sUAS is not located, the RPIC should immediately notify the local ATO facility, providing the location and circumstances, last known direction of flight and altitude, and the registration number. The RPIC will then immediately inform the chain of command, providing all details needed and complete the appropriate incident form.
4. LOSS OF POWER (Motor Failure)/sUAS Forced Landing (CRASH)
  - a. In case of a motor failure or loss of battery power, the sUAS cannot maintain flight. The RPIC will immediately notify the chain of command, note the location and time of the mishap and then, together with the supporting crewmembers, will attempt to locate and recover the sUAS. The RPIC shall assess the impact site for injuries, and render first aid if necessary. The RPIC shall take pictures of the sUAS at the impact site, record the location and

time and complete the necessary mishap forms. The RPIC will prepare the appropriate notifications to comply with Department reporting procedures.

**VIII. LOST COMMUNICATION WITH VO(s) OR ON-SCENE COMMANDER**

**A. Remote Pilot-in-Command (RPIC) and Visual Observer (VO)**

If the VO(s) is distant and not within normal speaking range of the RPIC, both the RPIC and the VO(s) shall use communication devices for continuous communications that are NOT on the tactical frequency at the scene. In the event the RPIC loses communications with the VO, the RPIC will immediately land the sUAS until communications can be regained. In all cases where there is a loss of communications and a concern for people or property, in the air or on the ground, the RPIC will immediately land the aircraft. Once communications with all crewmembers is re-established, the mission may resume.

**B. Remote Pilot-in-Command (RPIC) and Air Traffic Control (ATC)**

If required, the RPIC will communicate with ATC through use of two-way radio communications or a cellular phone based on the agreement between ATC and the RPIC. In the event the RPIC is unable to establish communications, the RPIC will immediately land the sUAS until communications can be regained. In all cases where there is a loss of communications and a concern for people or property, in the air or on the ground, the RPIC will immediately land the aircraft. Once communications with ATC is re-established, the mission may resume. The following chart is a quick reference guide for potential system failures and possible appropriate action to take:

<b>Potential System Failures</b>			
<b>Type of Failure</b>	<b>Sign of Problem</b>	<b>Monitored through Telemetry</b>	<b>Solution</b>
<b>Low Signal Strength</b>	Aircraft is slow to respond to PIC commands. Autopilot terminates manual control.	Yes. Signal strength displayed on downlink video screen.	Initiate auto landing based upon lost link programming. These procedures are pre-programmed by the manufacturer.
<b>Loss of Communication</b>	Aircraft fails to respond to PIC commands.	Yes.	The vehicle returns to loss communication waypoint, hovers until elapse of flight timer, then commences auto-land procedure
<b>Loss of GPS</b>	First indication is poor altitude hold performance, also poor	Yes. Indicated by number of satellites tracked and GPS Quality PDOP	Assume manual control of aircraft and land.

<b>Low Power Avionics</b>	System voltage warning audible and warning light	Yes.	Land immediately
<b>Low Power Actuators</b>	Lower than nominal voltage displayed	Yes.	Land Immediately
<b>Generator Failure</b>	Actuator or system voltages begin to fall	Yes.	Land when battery indicator indicates low levels.
<b>Engine Failure</b>	Noise level or RPM changes, engine loses power	No.	Return and land immediately. If engine dies initiate autorotation procedure.

## IX. NIGHT OPERATIONS

- A. As previously stated, any operation conducted between official sunset and sunrise will require approval from the incident commander or on-scene supervisor. The remote pilot will determine if a COA or Part 107 flight with waivers is required prior to accepting the mission. Prior to any night time operation, the remote pilot must have completed three take-off and landing sequences within the last 30 days using the sUAS of choice.
- B. All rated UAS operators who hold a FAA Part 107 certificate with night waivers must maintain currency after initial training for each night capable UAS. If a remote pilot does not have the training or currency has lapsed, the remote pilot will make arrangements with the program manager, or designee, to complete training and currency prior to accepting any night operation missions.
- C. All planned night operational flights will have a site assessment completed and documented on the operational document that will be used for the night operation. In the event that exigent circumstances exist and a day time assessment cannot be completed, the remote pilot and visual observer will conduct a site assessment using hand-held flashlights, or equivalent, upon arrival at the scene. When flight operations commence, the visual observer(s) will continue to monitor and communicate airspace intrusions, hazards, and any potential threats to the safety of the crew and UAS. Direct communication with the remote pilot and visual observer(s) will continue throughout the entire flight operation. If more crewmembers are required, they will also perform the same requirements as the visual observer unless directed by the remote pilot.
- D. In addition to night operations, all crewmembers are reminded that operations at night require at least 30 minutes of time to allow their eyes to adjust to the darkness for night vision. Chapter 17 of the Pilot's Handbook of Aeronautical Knowledge (Aeromedical Factors) will be reviewed and documented in each crewmember's logbook. All crewmembers will be familiar with Chapter 17 and should be able to recognize any potential hazards to night vision in regard to night operations. When the UAS night flight begins, the remote pilot will be restricted to only flying the UAS.

## X. MISSION CALLOUTS/REQUESTS

- A. There are generally three types of mission callouts/requests for which the Department may deploy its sUAS:
- B. Emergency Responses,
- C. Planned Support Missions
- D. Demonstration Flights.
- E. All requests for the deployment of a sUAS team will be coordinated through the appropriate supervisor on duty who will make the determination if deployment of the sUAS team will be appropriate for the mission. A mission should be planned prior to the flight unless a supervisor authorizes, due to immediate exigent circumstances, to conduct the flight posthaste. The RPIC will then proceed to set up the mission by reviewing the weather, location, type of incident and personnel to support the mission (VO, camera operator, etc.). The RPIC is then responsible for completing the flight log and any other required documents. No mission will be flown without authorization from the appropriate supervisor. The RPIC is authorized to evaluate the mission, perform any coordination that may be required, assess risk factors for the response, and accept, decline, or modify any mission request. The basis for declining a mission should be communicated to requesting personnel. The sUAS program manager, or program supervisor if immediately necessary, should be notified by the RPIC as to the reasons for declining a specific mission. Additionally, the sUAS pilot declining the mission should document the circumstances. Supervisor and RPIC considerations for authorizing deployment of the sUAS include, but are not limited to, the following:
  - F. The location of the mission, for purposes of ensuring the safety of people, officers and property.
  - G. Defined Incident Perimeter. Law enforcement personnel must secure the Defined Incident Perimeter to prohibit civilian traffic or interference and protect responding assets at the scene during flight operations.
  - H. The weather and its potential effect on the mission.
  - I. The potential usefulness of the information gathered through other means.
  - J. Any other relevant risk factors to successfully complete a risk benefit analysis for the use of a sUAS in the specific mission. A "Risk Assessment Worksheet" should be completed that includes all of the factors listed, and a point scale that requires escalating level of authority for high-risk flights. That "high-risk" can refer to threats to a crew from subjects in the vicinity/security, threats to a surveillance of detection, threats to the public from the operating environment or elevated risk due to a fatigued crew.
  - K. Operational Area Risk Review. The RPIC and Observer(s) are responsible for identifying all ground and flight hazards at the scene (i.e., infrastructure, buildings, tree canopy, distance between buildings, smoke, trees, bushes, power lines and other potential obstructions) and coordinate the preflight briefing accordingly. The flight team should identify cell towers, TV and microwave sources, which may create interference with the flight equipment. The equipment should be tested on the ground to ensure proper communications and operation before flight.

- L. Takeoff and Landing Site. This area should be free from obstructions or ground debris that may interfere with the rotors. This includes creation of flight line/launch and recovery zone from which all non-essential personnel must remain clear.
- M. Documentation. A copy of the current COA, flight log and pilot certifications must be kept with the sUAS at all times. At the conclusion of each mission, the RPIC will be responsible for completing all of the mission documentation and reports in the lead agency's Record Management Software.

#### **XI. TAKEOFF AND LANDING ZONES**

- A. The selection of an appropriate launch site demands careful attention to many factors. The selection of a suitable site shall be driven by safety first and foremost. Considerations for the selection of a suitable launch site include, but are not limited to, the following:  
The ability to remain within the Defined Incident Perimeter and maintain an adequate buffer zone between aircraft and responding personnel. The RPIC should maintain an adequate buffer between aircraft launch and recovery operations and all responding non-
- B. sUAS personnel. The RPIC may designate an individual as a Safety Officer to ensure the safety and security of the launch and recovery area.
- C. Coordination and Communications between crewmembers and the on-scene commander.
- D. The operation area selected by the sUAS team should be located within a secure perimeter, whenever possible. The area should be evaluated for adequate space and clearances in order to safely assemble, launch and recover the sUAS. Attention should be given to overhead obstacles and obstructions that may pose a risk to the sUAS during operation. The site selected and utilized by the sUAS team should be restricted and access granted to personnel for operational purposes only. The site should allow for long-duration sUAS operations free from access to casual observers and non-sUAS personnel, which can become a significant distraction.

#### **XII. ALTERNATE (EMERGENCY) LANDING SITES**

- A. Typically, the primary landing area shall be the same as the launch site. The RPIC has final authority for any approaches to the primary landing site and may wave off any approach deemed unsafe.
- B. The RPIC should designate at least one alternate landing site. In the event that the primary landing site is deemed unsafe, the alternate landing site should be utilized.
- C. The RPIC may optionally designate an "abortive flight site," whereby the aircraft flight may be terminated in an emergency situation. This site should be clear of people and structures as to limit the risk should the aircraft be required to vacate any airspace in the event of an emergency. Should the RPIC abort the sUAS flight, the sUAS may be flown to this site and the flight terminated.
- D. An adequate safety buffer should be established between the sUAS takeoff and landing area, and people not specifically involved in the sUAS flight operations.

#### **XIII. PROHIBITED ACTS**

- A. Unauthorized use, or use inconsistent with applicable law(s) of a sUAS, could result in disciplinary actions and/or civil and criminal penalties.

- B. The sUAS shall not be operated in violation of applicable law/regulations and/or the U.S. Constitution. When a search warrant is required by law, and no warrant exception exists, flight is prohibited unless a search warrant is obtained.
- C. The sUAS should not be flown in conditions that exceed the manufacturer’s recommended limitations to include range, ceiling, wind strength and battery charge.
- D. The sUAS shall not be flown for any mission that the RPIC determines the risk of flying the sUAS outweighs the benefit to the mission. Risks may include hazards to individuals, property on the ground, a possible collision hazard with other aircraft, and loss of control of the sUAS. The RPIC has sole discretion and responsibility for the safety of flight of the sUAS.
- E. sUAS flights are prohibited in Class B airspace without appropriate FAA Emergency COA (ECO) authorization and should not exceed a 400 foot ceiling height without prior approval from the FAA ATO authority.
- F. Only one sUAS should be flown by a single control station and by one pilot at a time. This guidance is not intended to prevent a second sUAS, with available technology, relieving the primary sUAS on station.
- G. sUAS operations are prohibited when other manned aircraft are operating within the Defined Incident Perimeter unless appropriate safety margins of altitude separation (de-confliction of airspace) can be established and maintained.

**XIV. AIR BOSS**

- A. The position of “Air Boss” is one that requires the ability to multi-task and prioritize during any given scenario or incident. An Air Boss is required when an incident or scenario involves the use of more than one sUAS to be operated at the same time. At no time will multiple sUASs be operated without this position being designated.
- B. If the mission dictates the use of multiple UAS operations, either by complexity or necessity, the Remote Pilot in Command (RPIC) will request the approval from the on-scene commander or incident commander. The PIC will then either become the Air Boss or a UAS team member will be designated to become the Air Boss. This position requires the ability to prioritize mission requests, logistics, support elements, air space considerations (clearance, NOTAMS and/or TFRs (Temporary Flight Restrictions)), and security of the sterile flight environment as well as the security of the flight operations area. No one person shall become an Air Boss without proper training or recommendation of the program manager, or program manager designee. Once flight operations are terminated, or the use of multiple UASs has been terminated, the position of Air Boss may be terminated with the approval of the on-scene commander or incident commander. As with any sUAS flight, the flight operations will be documented on all Operation Documents to include the notes from the Air Boss.

**XV. REMOTE PILOT AND VISUAL OBSERVER TRAINING**

- A. Remote Pilot-in-Command (RPIC)  
 Department RPICs flying a sUAS in support of any law enforcement mission should first receive appropriate aeronautical knowledge (“ground school”) training. Following completion of aeronautical knowledge training, the RPICs should complete initial flight training on the specific sUAS they will be flying operationally from the sUAS manufacturer (if

provided) or by a qualified/designated law enforcement sUAS instructor. Remote pilots should comply with these Standard Operating Procedures and remain current in order to be available for flight operations. The RPICs will maintain a working knowledge of the operational airspace, risk management policies and procedures, and the ability to obtain appropriate weather forecasts and conditions, and the filing of Notices to Airmen for the area of operations. All RPICs shall be familiar with the agency COA, applicable aviation regulations, and maintain proficiency in their operator and observer abilities. All RPICs must complete and document all flight training and mission flight time to maintain their sUAS currency, both as part of the COA or as required by the operator's FAA Remote Pilot Certificate. RPICs who do not, or cannot, maintain currency shall complete a proficiency flight check before performing pilot duties during an operational mission. Repeated failures to maintain proficiency will result in removal as a remote sUAS pilot. Qualification and training consists of the following:

1. Basic Aeronautical Knowledge and Flight Operations Training. All RPICs must successfully complete and pass a Basic Aeronautical Knowledge Training Curriculum and Initial Flight Operations Training administered by the sUAS manufacturer or a certified/designated law enforcement sUAS instructor.
2. Mission Training. All RPICs must also undergo Mission Training Exercises held on a routine basis to increase core competencies. These scenario-focused training events will include operation of the sUAS, crew coordination, communications, Observer duties and Safety Officer duties.
3. All RPICs must complete/log a minimum of three qualifying sUAS flights, to include takeoffs and landings, in the preceding 30 days to be eligible to act as Remote Pilot-in-Command during an operational mission. Each incremental takeoff and landing will be recorded on the PIC's logbook (electronic or handwritten log) for that current flight training session.
4. If a sUAS RPIC has not maintained currency in the sUAS, as describe above (fewer than three flights in the preceding 30 days), they must notify their immediate supervisor and will not be eligible to operate the sUAS as RPIC (except for training purposes) until they regain currency. In order regain currency as a RPIC, the RPIC has 30 days to fly the three Launch/Recoveries. These flights shall be observed and supervised by a certified/designated law enforcement sUAS instructor who will verify the RPIC competency in the flight of the sUAS.

The aforementioned training will also apply during night flights and include the following either under a COA or FAA Part 107 certificate with night waiver:

5. Three take-off and landing sequences within 90 days. All remote pilots will conduct initial training with each night capable UAS with the program manager, or designee. If a remote pilot does not have the necessary training to fly at night or does not have the appropriate training with a night capable UAS, the remote pilot will decline the mission or request a pilot with the appropriate training fly the mission. If at any time a remote pilot's currency lapsed for any reason, the remote pilot will complete flight currency with the program manager, or designee.

6. All crewmembers will review Chapter 17 of the Pilot's Handbook of Aeronautical Knowledge every three months and annual documented training will be completed in each crewmember's logbook.
  7. All remote pilot officers should participate in regularly scheduled training regarding sUAS. Training should include both aeronautical knowledge and flight training. Training shall include a review of all pertinent and related aviation matters and not limited to actual pilot, visual observer, and additional crewmember skills.
- B. Visual Observer (VO)
1. Just like RPICs, VOs supporting any law enforcement mission should first receive appropriate training. VOs shall comply with these Standard Operating Procedures and should maintain a working knowledge of the operational airspace, risk management policies and procedures, and support the crew coordination initiatives. Unless an exigent circumstance exists, at least one VO shall be assigned for all training and operational sUAS missions. Additional VOs may be necessary at the discretion of the RPIC.
  2. For initial training, VOs should be familiar with the specific operational parameters of the sUAS being used. VOs should also train with the RPIC to ensure proper crew resource management. Specifically, communications between the RPIC and the VO should be practiced in order that the VO will provide necessary information (i.e., hazards to flight) to the RPIC in a way that does not distract the RPIC and their operation of the sUAS. The VO should have a current working knowledge of the airspace intended for operations to determine potential risks to the sUAS flight. The VO should have the ability to obtain and interpret operational weather conditions to determine the risk to sUAS mission flight.

## **XVI. TRAINING LOCATION(S)**

- A. sUAS training events should only take place at a site designated and approved by the Department for such purpose. The location should be in somewhat remote areas that are clear of flight hazards, people, infrastructure and airports if at all possible.

## **XVII. MAINTENANCE PROCEDURES**

- A. Appropriate personnel should successfully complete a basic training course on sUAS maintenance related to the technology and its support equipment (e.g., battery maintenance, battery storage, battery safety, sUAS and ground control station (GCS) software updates and documentation, rotor blade or propeller replacements, etc.) from the manufacturer. They will carry out all scheduled and unscheduled maintenance, servicing and repairs of the sUAS that they are capable of performing, and they shall document all maintenance activities on agency Maintenance Action Forms (MAFs). All personnel shall be certified/trained on basic maintenance (e.g., battery replacement, battery safety and storage, propeller replacements, and basic sUAS frame maintenance (tightening screws)) to insure safety and security of flight.
- B. If a malfunction exists that cannot be repaired locally, the sUAS will be shipped back to the manufacture/vendor for repair as appropriate. Accurate and complete maintenance logs serve to validate the service history and airworthiness of the sUAS.

- C. The Department shall promulgate MAFs that will be available to the RPIC to complete before or after every mission. The MAF will provide adequate space to record a date, name of person making the report, and reason or malfunction for the report. Additional space directly across from the corresponding discrepancy block will document the corrective action narrative, date, and names of who performed and inspected the work performed. Once the corrective action has been documented, the corrective action should also indicate that a maintenance flight was performed (such as “ops check good,” “ops ck good,” or “OCG”) to verify system integrity, flight worthiness, and mission ready. At no time will the person signing the “corrected by” block be the same person who inspected the maintenance.
- D. The MAFs will be retained in a logbook serialized for the sUAS they are associated with (typical when any agency owns more than one sUAS), and be retained in the case or near the sUAS so that it may be referred to by any RPIC before flight. Each maintenance log will provide a line for signature by the RPIC or person discovering the malfunction, and the designated person who completed the service or repaired and returned the sUAS to service. The maintenance logbook shall accompany the sUAS and be serialized/labeled with the registration number of the sUAS.

- 1. Batteries

Electric powered sUAS technologies will typically use Lithium ion battery packs. Lithium ion batteries have exhibited several documented risks for fire or explosion if not properly handled, charged and stored. The sUAS batteries should be cycled and stored according to the vendor’s recommendation. These batteries are normally run through a charger on a monthly basis (as recommended by the manufacturer) to ensure reliability and immediate operability upon deployment. The charging and cycling of batteries should be documented in a sUAS Battery Log. Batteries shall be labeled with the date of first placed in use, a serial number and replaced as/when necessary. All sUAS shall have enough spare batteries to ensure sUAS operability for extended deployment/use with careful consideration given for cool down, and charging times. Note: not all batteries will have the same charge times regardless of sUAS type.

- 2. System Configuration Management

The following section outlines mission and system configuration management and associated data requirement best practices to be included as part of applicant applications and operational risk assessment (ORA) considerations. Overall change management practices should be adhered to regardless of whether the change occurring is within the mission concept, aircraft configuration, and use of a sUAS or the interaction between sUAS subsystems. The principles of change management and associated data requirements are part of the overall safety management of a program regardless of the size or scope of involved program’s operations. For type certification, there are data retention requirements and approval requirements that exist for any changes to the sUAS (including software elements).

- 3. System Configuration Management (CM) Plan

The Department shall maintain a simple CM plan for maintaining sUAS equipment and software as a fundamental supporting element of operational risk assessments

and in support of the operations and system configuration component of operations. It is vital to ensure that any hardware or software configuration changes or updates are properly documented and implemented. A CM approach provides the Department with a method to implement the policies, procedures, techniques and tools to manage system changes, evaluate proposed changes to a sUAS concept of operations (CONOPS) or ORA, track the status of changes to any system element, and maintain an inventory of sUAS systems and operations with associated documentation through the sUAS life cycle.

Changes to system and design requirements of the sUAS should be approved and documented according to a CM plan, and should reflect accurately the system design and operational status. Furthermore, the RPIC will be responsible for asserting that the sUAS is airworthy and safe for the intended flight.

#### 4. Data Requirements

Proper system maintenance and data management throughout system life cycle is essential to support a robust safety management process. Maintenance data management is the continuous development and maintenance of processes and procedures to assure that the Department has the necessary data in an organized, archived method to include a rational retention schedule. Periodic reviews of such data can support Department safety through trend analysis.

### **XVIII. RECORDS MANAGEMENT**

- A. The Department will develop and implement four basic records forms and/or software:
- B. Flight Tracking Form (FTF),
- C. Maintenance Action Form (MAF),
- D. Crew member training record and
- E. Mishap Reporting Form (MRF) (accident/incident form).

These are the four basic records that the Department shall retain in archives to properly record and document all sUAS activity. Additional program documentation may be required according to agency guidelines and reporting requirements. The Department has adopted the forms and checklists created by DPI that were used during the training process of all sUAS team members until new forms are created and approved.

The purpose of the FTF will be to accurately capture and record all flight events of each sUAS the Department operates. The RPIC shall be responsible for completion of the FTF at the conclusion of every mission (Training or Operational). Typically, there are several takeoff and landing evolutions during a mission which creates the need for adequate line entries on each form to record multiple takeoffs and landings; one line entry per every takeoff/landing evolution with spaces to record the time of takeoff and time of landing and any remarks for every flight at the end. One FTF may be used to record several flights with the same RPIC. If at any time the RPIC changes, a new FTF shall be used to record the new RPIC's flights. These forms are critical to capturing a complete operational history record of the sUAS. The FTF shall be designed to capture several critical flight elements, to include but not limited to the following:

1. Date
2. sUAS FAA Registration Number
3. RPIC Name
4. Observer Name
5. Other Crew Members
6. Location (latitude/longitude/geographic area, best description)
7. Prevailing weather conditions (wind, sky cover, temperature, etc.)
8. Purpose (training or operational, return to service after maintenance, etc.)
9. For each sortie (takeoff to landing) – takeoff time, landing time and total flight time
10. Total flight minutes/hours (sum of all flight times)
11. Specify Mission authority (Part 107, Blanket Area COA, Jurisdictional COA)
12. Signature of the RPIC
13. Remarks (to record any relevant information concerning the mission and any issues or concerns about the flight (malfunction, lost link, problems with communications, coordination, etc.)

The completed flight logs should be retained in a binder (logbook) that is labeled and serialized for the particular sUAS it belongs to, or as part of a mission tracking software document. The FTF “logbook” will remain with the sUAS for examination by RPICs, maintenance personnel, supervisory authorities and anyone else having the authorization to review them. The times from each FTF will be transcribed into a monthly and annual report in order to capture the total number of flights/missions and other information deemed appropriate by the agency. If there is any sUAS flight that has, or may have, evidentiary value, all forms, images, and video will be uploaded into the current evidence storage locations (e.g., online evidence storage, or the media will be physically retained in normal evidence procedures).

The purpose of the MAF will be to accurately capture and record all maintenance related actions for each sUAS owned and operated by the Department. Any malfunction, broken or missing part or element, or any abnormality discovered with the sUAS or the ground control station, shall be recorded on a MAF, and that particular sUAS shall be immediately removed from service until appropriate maintenance activity restores it to a safe and airworthy condition, and the MAF is signed off returning the sUAS to service.

All completed MAFs should be retained in a binder (logbook) that is labeled and serialized for the particular sUAS it belongs to. The maintenance “logbook” will remain with the sUAS for examination by RPICs, maintenance personnel, supervisory authorities and anyone else having the authorization to review MAFs. It is a best practice for the RPIC to review that last few MAFs in the logbook before commencing a flight if there has not been any significant maintenance history. The maintenance actions from each MAF will be transcribed into an annual report in order to capture and summarize the maintenance history of each sUAS.

The crewmember training record is an administrative document that records the name, date, location and the specific type of training received/completed by each crew member. These training records shall be retained in a Department training folder for each crewmember

assigned to the program whether online or in a binder. The supervisory personnel shall complete a quarterly review of each training record to ensure that all assigned personnel have completed all the training evolutions prescribed and administered. If testing is accomplished, the completed test and grade shall be retained in the training folder along with the training records.

The Department has a published Mishap Reporting Form (accident/incident form) and has made available for each team member. This form shall be completed by the RPIC for any event that is deemed relevant. In the event of an aircraft (sUAS) mishap that results in damage to the sUAS, damage to other property, injury to crewmembers or other people, the RPIC should immediately notify the chain of command and then complete the MRF with as much detail as possible. The RPIC should consider filling out a MRF whenever any abnormal event before, during or after a flight occurs. These can serve as risk awareness tools and help to establish further or revise mitigations.

Finally, complete and accurate records must be captured, managed and retained in a manner consistent with applicable laws and regulations. As with records collected by other investigative tools, sUAS units are obligated to retain sUAS collected data in accordance with applicable records retention schedules.

#### **XIX. OPERATIONAL RISK MANAGEMENT**

##### **A. Operational Risk Assessment (ORA)**

Overall change management practices should be adhered to regardless of whether the change occurring is within the operational doctrine, mission concept, aircraft configuration, pilot training, deployment of the sUAS or the interaction between sUAS subsystems. A vibrant and robust risk management program will enhance mission safety and improves citizen and leadership confidence in the overall program.

Identifying hazards and the risks they pose to sUAS operations is a critical function of risk management and operational safety. Mitigating operational risk to people (participating or nonparticipating) and property is the responsibility of all sUAS participants, and ultimately the RPIC. If operational constraints, environmental conditions or geographic limitations are insufficient for mitigating the risk to people and property, the mission or operational limitations may be revised, additional design assurances provided, or some combination of actions as specified and coordinated among the responding participants (see Appendix B).

##### **B. Operational Mitigations**

There are various methods to eliminate or mitigate existing operational risks from existing hazards. sUAS crew training is a key method of risk mitigation. Pilot and crewmember abilities to identify hazards are enhanced through training related to flight operations and airspace rules. Through the proper training, pilots and crews are able to develop the critical thinking required for appropriate response to hazards and an overall attitude of safety. For instance, training in standard preflight activities will lower overall risk as crews conduct disciplined checks

and assessments of mission plans in association with current conditions present at the time of each flight.

Likewise, response scenario training will help prepare sUAS members to effectively and safely respond with sUAS support of on-scene events. As a result, properly trained sUAS operators know that risk is reduced through mitigations identified during the preflight planning hazard assessment. Training may also dictate the level of pilot capability and knowledge. For flights conducted at or below controlled airspace, training received from another sUAS operator, an online course, or aeronautical training class may provide the necessary knowledge needed to understand airspace rules, aircraft limitations and operational rules of the sUAS operational environment.

Thorough system knowledge will also enhance pilot and crew capabilities. Knowledge of critical performance parameters of a sUAS, such as maximum command and control link range and lost-link protocols, is a precondition for flight. For example, if a directional antenna is used, one may choose to improve the antenna performance by physically pointing the antenna toward the aircraft in a more optimal manner consistent with its design. These practices offer a means to avoid potential lost-link hazards. System knowledge is important in recovering from unusual attitudes and avoiding high-risk maneuvers

Another mitigation will include predetermined Mission Go/No-Go Criteria. Similar to manned aviation, sUAS RPICs and crewmembers shall determine their go/no-go criteria in advance. The go/no-go criteria encompass more than simply assessing sUAS limitations. In addition, pilot capability, awareness of the relevant geography (including proximity to people), current and changing weather conditions across the entire flight path, and system limitations, among other factors, inform the final go/no-go decision.

Procedural Changes in Specific Flight Environments can support operational mitigations on the scene. sUAS pilots and crewmembers may need to incorporate additional operational limitations, flight procedures, maintenance processes, inspections and so forth depending on the flight environment. For example, if a sUAS operates in a particularly harsh environment, the frequency of inspections may need to be increased and additional maintenance performed.

### C. Common Operational Mitigations for sUAS

1. Operational Standards (SOPs). Written, published and periodically reviewed/revise operational procedures and doctrine provide the first layer of risk awareness and mitigation. This doctrine is developed to address known and anticipated risks for the operation of the sUAS, and procedures are implemented to overcome or reduce those risks. Most public safety agencies are familiar with the necessity of publishing such standards.
2. Training. sUAS crew training is a key method of risk mitigation. Pilots and Visual Observers and other crewmember abilities to identify hazards are enhanced through training related to flight operations and airspace rules. Through the proper training, various common operational risks can be mitigated and lessons learned may be

promulgated. Above all training activities is the need for consistent communications and coordination between the RPIC, all crewmembers, responding officers and the on-scene commander. Training scenarios (classroom and practical flight training events) should be developed to both enhance flight skills and situational awareness and focus on several anticipated CONOPS mission types. Practice with actual training scenarios that are patterned after expected real mission sets improves awareness, coordination and risk management.

## **XX. COMMUNITY OUTREACH, ENGAGEMENT, PRIVACY POLICY**

It is essential that the Department engages its community early in the planning process, including governing body and civil liberties advocates in order to avert any complaints or negative consequences that would inhibit or perhaps prohibit the acquisition of this technology. The Department shall assure the community that it values the protections provided to citizens by the U.S. Constitution. Furthermore, the Department will operate the aircraft (each sUAS) in full compliance with the mandates of the Constitution, and federal, state and local law governing search and seizure as well as flight operations and safety.

Program transparency, in so far as is practical, should permit the community an opportunity to review and comment on the agency sUAS program as it evolves. Where appropriate, recommendations offered by citizens or the governing councils should be considered for adoption in this policy. As with the community, the news media should be brought into the process early in its development.

Rigorous adherence to the requirements set forth in this doctrine is not enough to be successful in the public safety mission. The Department will continue to facilitate and nurture relationships of trust with the community it serves. Enhancing transparency about the Department's sUAS operations, including how the Department deploys and operates the technology, creates an informed community and greater confidence in the Department's decision making process. As appropriate, while not revealing information that might compromise law enforcement or national security needs, the Department will complete an annual review and update as needed its current policies and procedures, and will provide an end-of-year summary of sUAS operations conducted by the Department, including a brief description of types or categories of missions flown and the number of times the Department has provided assistance to other federal, state, local and tribal agencies or entities.

### **A. Protection of Privacy**

The Department operates under a set of rules, policies and laws that control the collection, retention, dissemination and disposition of records that contain personally identifiable information. For example, the Privacy Act of 1974 (that applies to federal agency records) contains provisions on unauthorized use and disclosure of information about individuals, and imposes civil penalties and criminal penalties on agency personnel for violations of applicable requirements. As with personally identifiable information collected in the course of any investigation, these authorities will be applied to information collected via sUAS.

Consistent with applicable existing laws and requirements, the Department's use of sUAS shall adhere to best practices and protocols.

As noted above, the Department shall only collect, use and disseminate information obtained from sUAS for an authorized lawful purpose. The Department shall not retain information collected using sUAS that may contain personally identifiable information for more than the allotted time as specified by the applicable rules, regulations or laws.

Data/imagery collected by the Department's sUAS operations that is retained must be safeguarded in accordance with applicable federal laws, executive orders, directives, policies, regulations, standards and guidance. These authorities ensure that agency personnel with access to such data follow practices that are consistent with the protection of privacy and civil liberties. Use of all agency information systems may be monitored, recorded and subject to audit, and any unauthorized collection, retention or dissemination of data is strictly prohibited. Further, the agency has procedures in place to review, investigate and address privacy and civil liberties complaints.

The Department's deployment of sUAS shall continue to be used in a manner consistent with the U.S. Constitution and all applicable laws, regulations and policies, including those protecting privacy and civil liberties.

## **XXI. SAFETY POLICY**

During sUAS Operations, the safety of all people is the number one priority of the sUAS team. It is the responsibility of the RPIC and all sUAS team members to assess all hazards within the Defined Incident Perimeter that could pose a potential safety risk, and to deny launching the sUAS or terminate a flight when it is clearly unsafe to continue. The RPIC shall bring safety-related issues to the attention of the on-scene commander and the other team members when any condition exists or develops that becomes a safety concern, including the safety of persons and property on the ground. It should be understood and acknowledge by all participants that the RPIC is the sole and final authority regarding the safe operation of the sUAS.

Except for agency personnel or other authorized persons as required by the mission, all sUAS team members will ensure that no persons are in the vicinity of the sUAS during operations. Under no circumstances should a sUAS operations be conducted directly over large gatherings of people, as a chase vehicle in a vehicle pursuit, or operated from a moving vehicle.

Except for the purpose of training or with specific supervisory approval, only sUAS personnel who meet the training and qualification requirements in this policy will be permitted to act as a team member.

The designated RPIC is authorized to evaluate and accept, or decline, any sUAS mission or portion thereof for which the safe completion of the mission is in question. Supporting VOs and other team members are expected to assist the RPIC with that mission evaluation and contribute mitigation strategies or issues that are relevant to the RPIC making a valid risk-based

decision. All sUAS team members shall comply with the sUAS Operator Manual, warnings, limitations, placards and/or mission checklists at all times unless an emergency dictates otherwise.

## **XXII. MISHAP REPORTING**

Any time any abnormal circumstance, event or mishap occurs before, during or after any sUAS flight, the RPIC is responsible for notifying the appropriate supervisor and completing the agency mishap report form. The RPIC shall be responsible for notifying the program manager or supervisor for any mishap involving injury or damage to property or the sUAS during any sUAS mission (training or operational). In the case of a serious mishap where injury, damage, forced landing or other serious emergency occurs, the RPIC shall be responsible for reporting and record submission in accordance with Department and FAA reporting requirements. The Department shall retain and make available to agency personnel the mishap reports so that appropriate lessons learned may be derived for every event with the intention to prevent any re-occurrence.

### **A. Mishap Action Priority**

Immediately following any incident/accident, all efforts will be focused on:

1. Minimizing any other risk to life or property
2. Rescuing and caring for the injured
3. Contacting emergency services (Fire, EMS, etc.)
4. Securing the mishap location from unauthorized entry (use of crime scene log mandatory for reported injuries)
5. Completing the initial notification to agency supervisors
6. Recording as much information as possible for the mishap report
7. Notify FAA and/or National Transportation Safety Board if required.

### **B. Mishap Investigations**

sUAS supervisory personnel utilizing an Accident/Incident Investigation Form shall conduct an initial mishap investigation. Any follow-up investigation(s) will be conducted by the appropriate Department personnel and shall include a careful review of all mishap reporting information.

### **C. sUAS Damage**

Any damage to the sUAS or its support equipment shall be immediately reported to the program manager or supervisor. Any damage to the sUAS or its equipment that is determined to render the system un-airworthy shall be labeled (e.g., utilizing a red tag) so as to be visually observable. A sUAS supervisor will be contacted and advised.

## **XXIII. DATA COLLECTION AND MANAGEMENT**

### **A. Image Recording and Retention**

Unless required as evidence of a crime, as part of an ongoing investigation, for training, or required by law, images or video captured by a sUAS should not be retained. All supporting imagery related to any operational mission that is retained will be treated in accordance with existing evidence control and archiving policies of the Department. Any time the sUAS is used for an operational mission, the entire mission shall be accurately recorded. The

recording will be removed from the sUAS and/or GCS and considered original evidence. That evidence shall be handled in accordance with the Department's electronic evidence guidelines, to include chain-of-custody considerations, and duplication to a storage medium that has an appropriate digital shelf life.

Cameras used on sUAS may capture images in areas that manned aircraft cannot which results in an increase concern by the Department of collateral or "unintended imagery" capturing of people or activities outside the scope of the investigation. Some examples of unintended imagery capture include surveillance of multistory dwellings in which a suspect resides. All personnel must be aware that the sUAS may capture images that are not intended and mitigate when necessary. Additionally, a sUAS may fly over someone's backyard that has a privacy fence and capture images in the yard or outbuildings that were not part of the investigation. Also, during public gatherings (e.g., public demonstrations), the sUAS will capture faces of non-participants and therefore potential identities of everyone in a line of demonstrators who are exercising their lawful right to assembly. This issue of unintended imagery capture creates a larger Constitutional issue that agencies must consider in the use and flight path control of their sUAS. The Department has developed and implemented retention of imagery approval to a higher level of authority within the agency for civil rights violations for further investigation.

Unless exempt by law, all retained sUAS images should be available for public inspection.