

**North Carolina Department of Labor  
Occupational Safety and Health Division**

**Raleigh, NC**

Field Information System

Operational Procedure Notice 150

**Subject:** Unmanned Aircraft Systems Operational Policy and Procedures

**A. Purpose.**

This Operational Procedure Notice (OPN) sets forth policies, procedures and instructions as outlined in the North Carolina Department of Labor (NCDOL) department wide policy on the use of Unmanned Aircraft Systems (UAS), which covers the Occupational Safety and Health (OSH) Division as well as the NCDOL Elevator and Amusement Device Bureau. This OPN provides information and guidance to support the OSH Division's use of UAS to collect evidence during compliance inspections where workplace locations are inaccessible and contain risks to OSH Division personnel. Other intended applications for UAS operations include training events, outreach activities and in support of both state and federal emergency significant events.

**B. Action.**

The NCDOL OSH Division will comply with the NCDOL UAS Policy and Procedures as applicable to the OSH Division.

**C. Recording and Tracking.**

To facilitate tracking where UAS are utilized during inspection, intervention and outreach activities, the following code will be used on inspection and intervention reports: S-19-DRONES.

**D. Effective Date.**

This OPN is effective on the date of signature. It will remain in effect until revised or canceled by the Director.

*Lee Peacock*

Lee Peacock  
District Supervisor  
UAS Program Manager/Chief Pilot

*Kevin Beauregard*

Kevin Beauregard  
Director

**6/15/2020**

**Date of Signature**



# Unmanned Aircraft Systems (UAS) Operational Policy and Procedures



## Unmanned Aircraft Systems Policy and Procedures

### TABLE OF CONTENTS:

1.	<u>INTRODUCTION AND BACKGROUND</u>	4
2.	<u>DEFINITIONS AND DESCRIPTIONS</u>	5
3.	<u>FLIGHT TEAM MATRIX</u>	6
4.	<u>PERSONNEL AND OPERATIONAL POSITIONS</u>	8
	CHIEF PILOT	8
	REMOTE PILOT IN COMMAND (RPIC)	8
	VISUAL OBSERVER (VO)	10
5.	<u>TRAINING</u>	11
	TRAINING PLANS	11
	RPIC INITIAL TRAINING	12
	RPIC RECURRENT TRAINING	13
	VO TRAINING	13
6.	<u>SAFETY</u>	13
	FLIGHT OPERATIONS SAFETY	13
	MEDICAL FACTORS	14
7.	<u>MISSIONS</u>	15
	MISSION MINIMUM PERSONNEL REQUIREMENTS	15
	MISSION PROFILES	15
	MISSION APPROVAL CRITERIA	16
8.	<u>PREFLIGHT OPERATIONS</u>	16
	PLANNING	17
	WEATHER	18
	PREFLIGHT INSPECTION	18
	MAINTENANCE	19
	PAYLOADS	19
	PREFLIGHT BRIEFING	19
9.	<u>INFLIGHT OPERATIONS</u>	20
	SYSTEMS OPERATIONAL TEST	20
	DURING FLIGHT OPERATIONS	20
10.	<u>POST FLIGHT OPERATIONS</u>	21
11.	<u>EMERGENCY FLIGHT PROCEDURES</u>	23
	LOSS OF DATALINK COMMUNICATIONS	23
	LOSS OF GLOBAL POSITIONING SYSTEM (GPS)	23
	AUTOPilot SOFTWARE ERROR/FAILURE	23
	LOSS OF POWER, ENGINE FAILURE/CRASH	23



## Unmanned Aircraft Systems Policy and Procedures

GROUND CONTROL SYSTEM FAILURE.....	24
INTRUSION OF ANOTHER AIRCRAFT INTO THE UAS MISSION AIRSPACE .....	24
LOSS OF VISUAL CONTACT .....	24
FLIGHT TERMINATION.....	24
FLY-AWAY PROCEDURES .....	24
<b>12. FLIGHT BOUNDARIES.....</b>	<b>25</b>
AIRSPACE CLASSIFICATION .....	25
AIRSPACE RESTRICTIONS .....	26
TEMPORARY FLIGHT RESTRICTIONS .....	27
BASIC GUIDELINES .....	28
<b>13. NOTIFICATION AND PERMISSION FROM AIRPORT AUTHORITIES .....</b>	<b>28</b>
<b>14. EMERGENCY SITUATIONS AND AIRSPACE WAIVERS .....</b>	<b>29</b>
<b>15. GEOFENCE AREAS .....</b>	<b>29</b>
<b>16. NIGHT FLIGHTS .....</b>	<b>30</b>
<b>17. FLIGHTS OVER PERSON/PEOPLE.....</b>	<b>30</b>
<b>18. RADIO AND EXTERNAL COMMUNICATIONS.....</b>	<b>31</b>
<b>19. REGULATORY COMPLIANCE.....</b>	<b>31</b>
AIRCRAFT REGISTRATION .....	31
ADDITIONAL FEDERAL AVIATION ADMINISTRATION (FAA) COMPLIANCE.....	32
<b>20. ACCIDENT INVESTIGATION AND REGULATORY NOTIFICATION .....</b>	<b>32</b>
ACCIDENT INVESTIGATION .....	32
FAA ACCIDENT REPORTING .....	32
NATIONAL TRANSPORTATION SAFETY BOARD (NTSB)ACCIDENT REPORTING.....	33
<b>21. PERSONAL EQUIPMENT.....</b>	<b>34</b>
<b>22. DATA MANAGEMENT AND REPORTING REQUIREMENTS .....</b>	<b>34</b>
IMAGES AND VIDEO .....	34
FLIGHT LOG AND DOCUMENTS .....	35
<b>23. PROGRAM REVIEW AND AUDIT .....</b>	<b>35</b>
<b>24. REFERENCES .....</b>	<b>36</b>
 <b>APPENDIX</b>	
Appendix 1 <b>AUTHORIZATION FROM PROPERTY REPRESENTATIVE FORM.....</b>	37
Appendix 2 <b>FAA REQUEST FORM FOR EXPEDITED SGI WAIVER OR AUTHORIZATION FOR UAS OPERATION .....</b>	38
<b>UAS POLICY and PROCEDURES VERSION CONTROL.....</b>	<b>41</b>



## Unmanned Aircraft Systems Policy and Procedures

### **1. INTRODUCTION AND BACKGROUND:**

#### **INTRODUCTION:**

The intent of the Unmanned Aircraft Systems (UAS) program is to provide aerial support and assistance to the North Carolina Department of Labor (NCDOL) personnel pursuant to the Department's overall mission of fostering a safe, healthy, fair and productive North Carolina. UAS provides enhanced operational capability, safety, and situational awareness for Department staff, first responders, affiliated partners, and the community. They can operate in many types of environments or critical incidents, natural or manmade, which are potentially hazardous to the safety of employees, first responders or other individuals. UAS provides a unique, viable, safe, versatile, supplemental tool for conducting various types of investigations, compliance inspections, and during events involving first responders. UAS is not a replacement for manned aircraft that have a different set of capabilities, but for some missions, UAS provides emergency management and first responders with a tool that can access areas where manned aircraft cannot fly due to weather or other safety regulations.

Unmanned aircraft shall be operated in a responsible manner consistent with Department policy, North Carolina State laws, and federal rules and regulations; ensuring that the privacy rights of the people in the State of North Carolina are respected. This document will define the missions, training requirements, command relationships, standardization, specific flight team responsibilities and duties, and the reporting requirements to which Department employees will adhere to in order to operate and safely deploy unmanned aircraft.

#### **BACKGROUND:**

Throughout the years, the OSH Division has investigated numerous high-profile fatality/catastrophic and accident incidents at sites which were caused by fire/explosions, chemical releases, excavation/trench collapse, structure collapse and logging/tree felling to name a few. As part of the investigative process, compliance officers have often faced challenges in safely collecting evidence. Many times, the site had to be controlled or made stable before access was gained to start inspecting the site. During this time, evidence could have moved or been destroyed. This waiting period has also caused significant delays in completing the investigation.

There have been occasions where the staff needed a 'birds-eye' view to be able to confirm whether an employer followed an applicable standard. To obtain this information, cooperation between various employers, local fire departments and other entities to secure the use of aerial lifts and ladder trucks was involved. Although extremely helpful, the time spent coordinating the use of the equipment has also led to delays in the investigative process.

In addition to the investigative process, images can also be captured and used from an educational and outreach perspective. Photographs and videos of hazards from the drone's elevated angle can be used to enhance a case and clearly demonstrate violations (as we currently do from the ground). Another use of the drones is during natural disasters where images of an impacted area may be beneficial in deployment of additional resources or staff to mitigate hazards and accident/injury prevention. Likewise, the Elevator and Amusement Device Bureau conduct inspections of elevator equipment, large shafts, windmills, communication tower hoists/elevators, and amusement devices. As part of the inspection process, inspectors are often required to climb on top of amusement rides (such as Ferris wheels), large wind turbines and sections of communication towers to inspect hoists/elevators. The use of drones can help the inspectors see the equipment and components from the ground and will possibly eliminate the need to climb on the structures and being exposed to fall hazards.



## Unmanned Aircraft Systems Policy and Procedures

The use of drones has allowed Department employees to reach the most remote areas in a more timely and efficient manner, improve photographic and videography accuracy, but most importantly, being able to eliminate hazardous conditions and keeping the NCDOL staff, first responder community and the employees of NC safe.

It is the mission of the NCDOL UAS Flight Team to use the UAS Policy and Procedures to support compliance, investigation, education/training and public outreach missions associated with the duties of the Department and during other significant events in direct support of both federal and state agencies as part of the state and national emergency response plans.

### **2. DEFINITIONS AND DESCRIPTIONS:**

**Airworthiness Statement** – The Airworthiness of the UAS is self-certified by the Remote Pilot in Command (RPIC) through a preflight inspection prior to flight.

**Crewmember** – A person assigned to duties essential to the operation of the unmanned aircraft system during flight time.

**FAA** – Federal Aviation Administration.

**Flight Time** – Remote piloting flight time commences when an aircraft moves under its own power for the purpose of flight and ends when the aircraft comes to rest after landing.

**LAANC** – Low Altitude Authorization and Notification Capability, a collaboration between FAA and industry. It directly supports UAS integration into the airspace. LAANC provides:

- Drone pilots with access to controlled airspace at or below 400 feet.
- Awareness of where pilots can and cannot fly.
- Air traffic professionals with visibility into where and when drones are operating.

**Mission Area of Operations (AOR)** – A defined perimeter/parameter to be determined based on the scope and type of the operation and a defined operational ceiling at or below 400 feet above the ground. The altitude of the small unmanned aircraft cannot be higher than 400 feet above the ground, unless the small unmanned aircraft is flown within a 400 feet radius of a structure and does not fly higher than 400 feet above the structure's immediate uppermost limit.

**National Airspace System (NAS)** – Airspace inside the continental United States. It is further defined through air navigation facilities, equipment and services, airports or landing areas, aeronautical rules, regulations and procedures. There are two types of airspace within the NAS, controlled and uncontrolled. Operation of a UAS in controlled airspace adds another layer of responsibilities and requirements that must be met to operate the UAS.

**Night Flight** – Flight of a UAS that occurs between the hours of one-half hour after sunset and one-half hour before sunrise. The time of sunset and sunrise are determined by the National Oceanic and Atmospheric Administration (NOAA) but 14 CFR Part 107 - Small Unmanned Aircraft Systems will allow small UAS operations to be conducted during civil twilight if the small unmanned aircraft has lighted anti-collision lighting visible for at least 3 statute miles. The nighttime-operations prohibition in this rule is waivable through the FAA for 14 CFR Part 107.

**Obstacle Sensing System** – Aircraft system that constantly scans for obstacles in order to avoid a collision of a UAS with another object.



## Unmanned Aircraft Systems Policy and Procedures

**Person Manipulating the Controls (PMC)** – A person other than the remote pilot in command (RPIC) who is controlling the flight of an sUAS under the supervision of the RPIC.

**Remote Pilot in Command (RPIC or Remote Pilot (RP))** – A person who holds a remote pilot certificate with a small unmanned aircraft system (sUAS) rating and has the final authority and responsibility for the operation and safety of an sUAS operation conducted under 14 CFR Part 107.

**Small Unmanned Aircraft System (sUAS)** – UAS is the unmanned aircraft system and all of the associated support equipment, control station, data links, telemetry, communications, and navigation equipment, etc., necessary to operate the unmanned aircraft in the NAS. The aircraft's flight is controlled either autonomously by hardware within the UAS or under the remote control of a Remote Pilot on the ground or in another ground vehicle. For purposes of this program, the 14 CFR Part 107 compliant UAS shall weigh less than 55 pounds fully loaded. Maximum groundspeed is limited to 100 mph (87 knots).

**UAS Base** – Area set up for deploying UAS during operational flights.

**Unmanned Aircraft (UA)** – An aircraft operated without the possibility of direct human intervention from within or on the aircraft.

**Visual Flight Rules (VFR)** – All flights with the UAS shall be conducted under VFR conditions and at an altitude below 400 feet above ground level (AGL). VFR is established as a 3-mile visibility and a cloud ceiling of 1,000 feet for day operations and 5-mile visibility with a cloud ceiling of 2,000 feet for night operations.

**Visual Line of Sight (VLOS)** – Controlling of the UAS with vision that is unaided by any device other than corrective lenses. The RPIC, visual observer (VO (if used) and the PMC of the sUAS must be able to see the unmanned aircraft throughout the entire flight in order to:

- Know the unmanned aircraft's location;
- Determine the unmanned aircraft's attitude, altitude, and direction of flight;
- Observe the airspace for other air traffic or hazards; and
- Determine that the unmanned aircraft does not endanger the life or property of another.

Throughout the entire flight of the small unmanned aircraft, the ability described above must be exercised by either:

- The RPIC and the person manipulating the flight controls of the small unmanned aircraft system; or
- A visual observer.

**Visual Observer (VO)** – A person who is designated by the RPIC to assist the RPIC and the PMC of the sUAS to see and avoid other air traffic or objects aloft or on the ground.

### **3. FLIGHT TEAM MATRIX:**

The UAS program currently includes two main divisions of the North Carolina Department of Labor: Standards and Inspections (S&I) and Occupational Safety and Health (OSH). Within these divisions, the following bureaus are covered under this policy:

**S&I:**  
Elevator and Amusement Device Bureau (EAD)



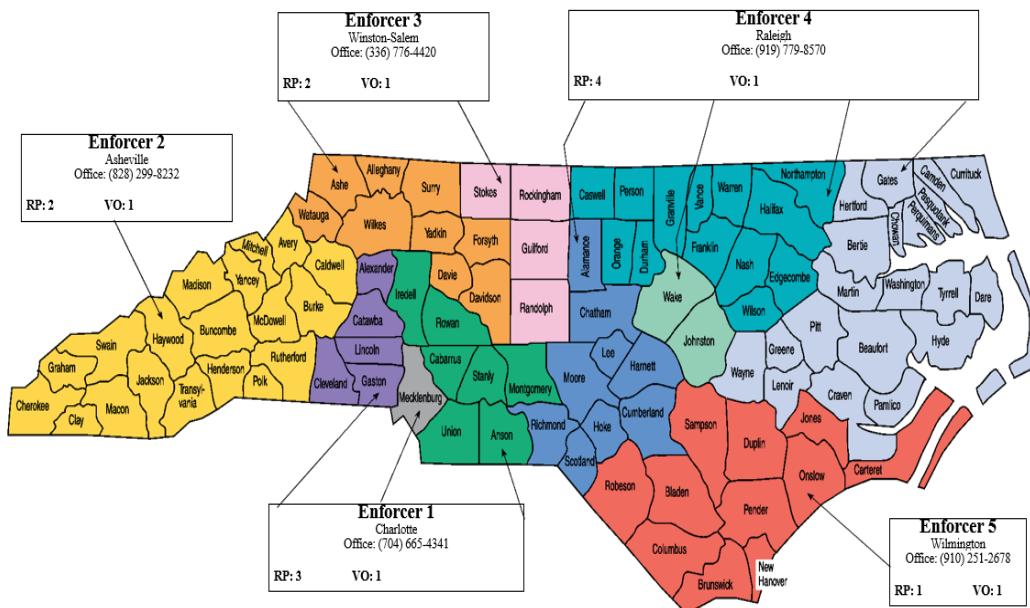
## Unmanned Aircraft Systems Policy and Procedures

### OSH:

Compliance Bureau: East and West

Education, Training and Technical Assistance (ETTA) Bureau: Standards, Training, Recognition

The flight team will be comprised of 18 remote pilots and eight visual observers. A certificated remote pilot will be designated for each compliance district, except for Asheville and Wilmington which will have two (dependent upon staffing rotation and fully released compliance safety and health officers (CSHOs)). The ETTA Bureau will have three designated certificated remote pilots which will be housed in the standards, training and recognition program sections. The EAD Bureau will have two certificated remote pilots. This arrangement will afford the agency to have certificated remote pilots and visual observers to be able to rapidly deploy statewide where flight operations will commence (See Figure 1).



Team Matrix:	
Chief Pilot/RP= 1	VOs = 8
RP= 17	
Total UAS Crewmembers: 26	

Trainer 1 (Sds, Train, Outreach)	Elevator 1 (Raleigh Office: (336) 694-5159 RP: 1 VO: 1)	Elevator 2 (Raleigh Office: (919) 807-2770 RP: 1 VO: 1)
RP: 3 VO: 1		

Figure 1- NCDOL UAS Flight Team Matrix



## Unmanned Aircraft Systems Policy and Procedures

### **4. PERSONNEL AND OPERATIONAL POSITIONS:**

#### **CHIEF PILOT**

The UAS Program Manager (Chief Pilot) is responsible for the development and performance of the training program for all UAS operations. The Chief Pilot shall have authority over the remote pilots, visual observers, and crewmembers and will ensure that all team members are trained, licensed, and operational as needed. The UAS Chief Pilot or RPIC is responsible for the overall safety during UAS operations.

##### **Position Requirements**

- Current Remote Pilot Certificate issued by the FAA with small UAS rating.
- Current UAS Government Operator Permit issued by the North Carolina Department of Transportation (NCDOT) Aviation Division.
- Meet all the RPIC requirements.

##### **Duties and Responsibilities**

- Oversee the NCDOL UAS program.
- Develop and revise UAS standard operating procedures.
- Maintain a current list of all certified crew members, including Remote Pilots and Visual Observers.
- Ensure RPIC is current with the training and knowledge and perform proficiency check flights of all pilots and visual observers.
- Maintain all training records for flight crews.
- Responsible for disseminating any legislative or regulatory revisions to UAS Flight Team.
- Provide ground school and flight training to UAS Flight Team.
- Coordinate after action conferences and additional training as needed.
- Coordinate any manufacturer updates to aircraft or software version enhancements.
- Ensure that all flight plans and other documentation is completed and maintained.
- Maintain a file for each RP and airframe. The file shall include copies of training records, flight incidents, maintenance records, etc.
- Ensure that the RP has all documents required as per FAA, state and Department guidelines.
- Ensure all UAS are registered with the FAA and are in airworthy condition.
- Maintain insurance coverage on sUAS and update annual policy.
- Coordinate annual sUAS and equipment inventory with UAS Flight Team.
- Coordinate repair, maintenance and replacement of sUAS when needed.
- Responsible for acquisition requests for replacement parts and additional equipment as part of overall program.
- During multiagency flight operations, coordinate with other agency's UAS Chief Pilot, RPICs, and work within the Incident Command System (including state/federal emergency operations center) when applicable.
- Coordinate with military air traffic control for operations within a Military Operations Area (MOA).
- Responsible for annual UAS program audit and review.

#### **REMOTE PILOT IN COMMAND (RPIC)**

RPIC is a designated crewmember who is responsible for the overall safe operation of a small unmanned aircraft system and has final authority over that operation. The division bureau chief must approve any request for an agency employee to become trained as an FAA Part 107 pilot. To be considered for selection as an operator, applicants must meet the requirements for and obtain the FAA Remote Pilot Certification under 14 CFR Part 107 and the North Carolina UAS Government Operator Permit issued by



## Unmanned Aircraft Systems Policy and Procedures

NCDOT Division of Aviation in order to be accepted into the UAS Flight Team. Once approved, the candidate will work directly with the UAS Chief Pilot to participate in both ground and flight school and familiarization training. The Pilot-In-Command will be responsible for flying the aircraft in a safe and approved manner and will assume overall responsibility for all safety related matters.

### Position Requirements

- Current Remote Pilot Certificate issued by the FAA with UAS rating.
- Current UAS Government Operator Permit issued by the NCDOT Aviation Division.
- Minimum of 5 flight hours for the specific aircraft type to be flown.

### Duties and Responsibilities

Available to respond to fly agency approved missions. Responsible for ensuring safety of each flight operation.

- The RPIC is solely responsible for everything the flight team does or fails to do and has final authority in determining if flight operations will take place.
- The RPIC is authorized to refuse any flight request based on current meteorological conditions, physiological conditions, or for any other reason that RPIC believes will affect the safety of the flight. Should the RPIC refuse a flight for any reason, they shall inform the Chief Pilot as soon as possible of such refusal and the reason for refusal.
- While the UAS is in flight, the RPIC is authorized and responsible for making all decisions regarding use of the UAS including, but not limited to, direction of UAS, duration of flight time, capabilities of the UAS, and use of affixed certified equipment.
- The RPIC is responsible for the safe conduct of all flights, including, but not limited to:
  - (a) Flight planning and preparation, including pre-flight inspections of UAS and equipment;
  - (b) Contacting communications via email or phone with pertinent mission information;
  - (c) Weather briefing;
  - (d) Flight operations, including course, air speed, altitude, and duration;
  - (e) Landing zone selection;
  - (f) Go/no-go and landing judgments with regard to weather minimum or other criteria;
  - (g) Flight crew communications, Air Traffic Control (ATC) communications, and any other radio communications;
  - (h) Timely reporting of new or previously unknown hazards to safe flight encountered;
  - (i) Post-flight inspection, to include assuring batteries are recharged and to ensure the aircraft is ready for the next mission;
  - (j) After each deployment, maintaining and making appropriate entries in the SafetyDrone data management software.
- Flight Operations – Operational Control – Remote Pilot-in-Command Authority:
  - (a) The RPIC shall initiate the flight only when confident the flight can be conducted safely.
  - (b) If required by FAA, the RPIC shall ensure a FAA Notice to Airmen (NOTAM) is released for every flight involving the UAS in the national airspace.
  - (c) If required by FAA, the RPIC shall ensure there is a Certificate of Authorization (COA) or waiver from the FAA to conduct flights in the national airspace.
  - (d) If an emergency waiver is required by the FAA for a particular flight, prior to submitting the waiver or contacting the FAA, the RPIC will notify the Chief Pilot and will complete the flight mission approval process (see Section 14, Emergency Situations and Airspace Waivers).
- Ensuring that pilot flight hours, aircraft hours, and other paperwork is completed for each mission.
- Notify the UAS Chief Pilot of any mission requests and complete the flight approval process.
- Ensure flight conditions complies with all applicable FAA and state rules and regulations, including flight within line of sight requirements.



## Unmanned Aircraft Systems Policy and Procedures

- Follow checklists for each flight regardless if training or actual mission.
- The RPIC will be responsible for ensuring that all safety protocols are followed prior to, during, and after each flight.
- As RPIC, any additional duties/tasks which does not support the immediate flight operation will be prohibited. The sole purpose of the RPIC is to see and avoid mid-air collisions, safety of personnel/citizens and to ensure a safe flight.
- Operators interacting with ATC or Terminal Radar Approach Control Facilities (TRACON) shall have sufficient expertise to perform that task readily. Operators must understand, and comply with FAA regulations applicable to the airspace where the UAS operates.
- An operator's primary duty is the safe and effective operation of the UAS in accordance with the manufacturers' approved flight manual, FAA regulations, NC General Statutes and Department policy and procedures. Operators must remain knowledgeable of all FAA regulations; UAS manufacturer's flight manual and bulletins and Department policy and procedures.
- Operators may be temporarily removed from flight status at any time by the Chief Pilot, for reasons including performance, proficiency, medical, physical condition, etc. Should this become necessary, the operator will be notified verbally and in writing of the reason, further action to be taken and expected duration of such removal.
- It is the responsibility of the RPIC to ensure the UAS is registered and in airworthy condition prior to UAS flight operations.

### VISUAL OBSERVER (VO)

The VO is responsible for supporting the RPIC to help ensure all UAS operations are done in a safe, protected, and effective manner. All flight operations, operational or training, shall, at a minimum, have both a RPIC and a VO.

#### Position Requirements

- Completed VO training course
- Been preapproved and designated as VO by Chief Pilot

#### Duties and Responsibilities

- Performing assignments assigned by a RPIC.
- Assisting the RPIC in the safe conduct of all flights, including but not limited to:
  - (a) The VO shall assist in see-and-avoid operations of the UAS. The VO shall remain in contact with the RPIC and communicate any obstacles the aircraft might encounter.
  - (b) If the flight becomes a hazard to ground personnel or other aircraft, the VO shall immediately notify the RPIC.
  - (c) During any phase of flight, if the VO notices a malfunction with the aircraft, the RPIC shall be immediately notified.
- Maintain an unaided visual line of sight any time the aircraft is airborne.
- Ensure the takeoff and landing zones, and surrounding area, are clear and safe from members of the public or other deemed hazards.
- Coordinate as needed with the Incident Commander via in-person, voice, or other communication modes.
- Focus 100-percent of attention on the aircraft once airborne. An observer's primary duty is to see and avoid mid-air collisions, on ground incidents and accidents by alerting the RPIC of any issues which will interfere with the flight.
- Ensure that there are no potential conflicts in the sky such as birds, aircraft, wires or trees.



## Unmanned Aircraft Systems Policy and Procedures

- Observers must have been provided with sufficient training to communicate clearly to the operator regarding any turning instructions required to stay clear of conflicting traffic and obstacles.

### **5. TRAINING:**

The key to continued safe operations is by maintaining a professional level of competency. The first step in this process is establishing minimum qualifications for selecting operators, and the second step involves training those personnel. The Chief Pilot shall develop and approve a training curriculum to assess the knowledge, skills and abilities of RPICs and VOs to obtain the required federal and state certifications, build flight proficiency and to ensure compliance with this policy.

The UAS training program contains three major tiers which all RP candidates must successfully complete; Ground School, Flight Skills and Recurrent Training. The ground school course is designed to prepare the pilots to pass the FAA 14 CFR Part 107 Remote Pilot examination. The course is structured to teach topics such as basic aeronautical knowledge, meteorology, radio communications, crew resource management, federal/state/local regulations, national airspace, flight rules and procedures.

The second training tier is designed so the pilots can build and master flight skills utilizing the UAS equipment and learn how to conduct safe flight operations. During the flight skills training, the pilots must be able to show they have acquired knowledge utilizing all the equipment, data management software program, effective crew resource management, emergency flight procedures, risk mitigation strategies, communication and operating rules and procedures. The RPs must obtain at least 5 flight hours and successfully complete a flight review/check ride before being authorized to fly operational missions.

The VOs are also integrated into various sections of the flight skills training tier. The VO training is designed to build upon proper utilization and communication of crew resource management between the flight crewmembers to ensure safe flight operations. The VOs will train with the RPs and must successfully pass a knowledge test. After passing the knowledge test, the VOs will receive additional 'hands-on' training while engaging with the RPIC during flight skills assessment training. The VO will be evaluated by the Chief Pilot to ensure they have acquired the knowledge and skills needed to successfully fulfill the duties as a VO.

Recurrent training is the third training tier and is critical in maintaining flight proficiency and conducting safe flight operations. The Chief Pilot will coordinate and schedule training events on a biannual basis, dependent upon budgetary constraints. The training sessions will be comprised of flight skills enhancement, regulatory updates, internal policy updates, ground school refresher training, equipment proficiency, scenario-based missions, and other topics as needed.

### **TRAINING PLANS**

1. All RPICs and VOs will have a training plan on file that outlines training objectives.
2. All deployments, missions, and training exercises are documented and count toward an operator's training. The RPs are required to sync/upload flight hours in the SafetyDrone data management software.
3. The UAS Chief Pilot and RPIC have the responsibility to verify the training file contains all pertinent information.



## **RPIC INITIAL TRAINING**

1. The RPIC shall show proficiency in basic aeronautical knowledge as it relates to the use and operation of UAS assets. The RPIC shall pass an initial aeronautical knowledge test at an FAA-approved knowledge testing center or comply with the 14 CFR Part 107 protocols for a licensed and current pilot under 14 CFR Part 61 – Certification: Pilots, Flight Instructors, And Ground Instructors. In addition, operators must obtain the North Carolina UAS Operator Permit. 2. The basic aeronautical knowledge training, at a minimum shall include:

- FAA rules pertaining to UAS flight operational limitations; rules and responsibilities described in 14 CFR 91.111 – Operating Near Other Aircraft; 14 CFR 91.113 – Right-of-Way Rules: Except Water Operations; and 14 CFR 91.155 – Basic VFR Weather Minimums; knowledge of air traffic and radio communications, including the use of approved ATC/pilot phraseology, operating in the National Air Space; and knowledge of appropriate sections of the Aeronautical Information Manual;
- All aspects of 14 CFR Part 107;
- Knowledge of the rules and responsibilities described in 14 CFR 91 – General Operating and Flight Rules;
- North Carolina UAS General Statutes and regulations;
- Crew Resource Management;
- Mission planning requirements for establishing the Mission AOR and Perimeter Flight Boundaries;
- Mission briefing requirements to include Department's approved checklists and Manufacturer's recommendations;
- Mission post briefing requirements;
- Data Management Software system; and
- Any other specific responsibilities required by the Chief Pilot to accomplish the Department's mission.

3. In conjunction with fulfilling all training requirements for RPICs duties, the operator must also be familiar with UAS operations, the aircraft and equipment.

4. Any operator who fails to successfully complete the initial training may be denied as a RPIC of the UAS operation.

5. The RPIC shall show proficiency operating the specific UAS model in flight including emergency procedures. The RPIC's proficiency shall be evaluated by the Chief Pilot or his/her designee who has mastered aeronautical knowledge and training as it pertains to the use of an unmanned aircraft.

6. The RPIC shall show proficiency communicating and crew resource management with the flight team members (VO, RP and PMC) demonstrating satisfactory communications between team members. The RPIC's communications will be evaluated at all stages of the flight continuum: pre-flight inspection, flight operations, and post flight procedures.

7. Before an operator can fly as RPIC, he/she must complete at least 5 hours of flight training with the Department assigned UAS Chief Pilot or another licensed RP. Upon completion of the 5 hours, the RPIC shall demonstrate proficiency in all the technology and support equipment associated with any assigned mission. The RPIC's proficiency shall be evaluated by the Chief Pilot. The RPIC will be required to successfully complete a flight review/check ride administered by the Chief Pilot to show proficiency of the flight training exercises, the airframe and knowledge of the UAS.



## **Unmanned Aircraft Systems Policy and Procedures**

8. A RPIC may be authorized to operate more than one type of UAS. Prior to being able to operate as RPIC of the additional UAS type, the RPIC is required to have a current certification, successfully complete 5 hours of flight training and complete a flight review/check ride administered by the Chief Pilot for the specific model UAS. The RPIC may only operate one UAS at a time.

### **RPIC RECURRENT TRAINING**

1. In order for an RPIC to maintain their active flight status, every 90 days, the RPIC shall conduct a minimum of one flight for a duration of no less than 30 minutes which shall consist of at least two take offs, two landings and one battery change. The RPIC shall conduct and document a preflight inspection and complete their flight log in SafetyDrone. The flight can consist of an actual completed mission or training exercise during this 90-day period.
2. All operators shall maintain proficiency in their RPIC abilities. Operators who do not have any documented training or flight time within a span of 90 days will have to show proficiency before being a RPIC during an UAS operation or exercise.
3. Recurrent training is not limited to actual operating skills but includes knowledge of all pertinent UAS/aviation matters.
4. Failure to prove proficiency, not maintaining a current FAA Remote Pilot Certificate and NC UAS Government Operator Permit can result in removal from the UAS Flight Team.

### **VO TRAINING**

1. Designated UAS VOs shall complete sufficient training to efficiently communicate pertinent inflight observations with the RPIC so that the UAS aircraft remains clear of conflicting air traffic and obstructions.
2. This training, at a minimum, includes:
  - Knowledge of the supporting tasks described 14 CFR 107 with respect to maintaining Line of Sight, and effective communication.
  - Knowledge of the supporting tasks described in 14 CFR 91: Operating Near Other Aircraft; Right-of-Way Rules; and Basic VFR Weather Minimums.
3. The VO's proficiency shall be evaluated by the Chief Pilot. The VO will be required to successfully complete a written test and a flight review by the Chief Pilot to show proficiency of the training and being able to effectively communicate with the RPIC to see and avoid mid-air collisions and on ground incidents.

### **6. SAFETY:**

#### **FLIGHT OPERATIONS SAFETY**

The Department UAS program is intended to ensure flight operations are conducted in a safe, lawful and responsible manner. Each crewmember has the responsibility to prevent and mitigate risks and contribute to the ultimate goal of zero accidents and injuries. Each crewmember is required to comply with this policy, manufacturer's recommendations, federal, state, local laws and regulations. Additional items to foster a safe UAS program includes:



## **Unmanned Aircraft Systems Policy and Procedures**

- Each mission contains an element of risk and risk mitigation strategies should be employed. This includes the pre-flight activities and continue through the entire flight.
- All crewmembers are responsible to remain in constant communication and advise each other of any aspect that would impact the safety of the flight operation. This includes the authority and responsibility to act immediately to warn others and to suspend operations.
- All flight operations shall comply with the UAS Policy and Procedures, federal, state, local laws and regulations.
- Unnecessary risks shall be avoided.
- All recognized safety hazards (including procedural, operational or maintenance related) shall be immediately corrected.
- Regular audits of policies, procedures, and flight operations. Any suggestions or recommendations related to safety improvements should be communicated to the Chief Pilot.
- Research, review and implement UAS best safety practices.

Any observation or knowledge of an unsafe act or condition pertaining to the flight operation or UAS shall be immediately reported to the Chief Pilot. The Chief Pilot will investigate the condition and take immediate corrective action if warranted.

### **MEDICAL FACTORS**

According to 14 CFR Part 107.17: "no person may manipulate the flight controls of a small unmanned aircraft system or act as a remote pilot in command, visual observer, or direct participant in the operation of the small unmanned aircraft if he or she knows or has reason to know that he or she has a physical or mental condition that would interfere with the safe operation of the small unmanned aircraft system."

In accordance with this regulation, every crewmember will adhere to the following:

- Pilots, VOs and crewmembers will not be allowed to conduct flight operations if they are not rested and emotionally prepared to complete the tasks.
- Any crewmember which is experiencing physical illness, exhaustion, emotional problems or other issues which could seriously impair judgment, alertness or memory shall not act as a RP, PMC or VO. Crewmembers are expected to immediately stand down when these problems could reasonably be expected to affect their ability to perform flight operations.
- During the pre-flight activities, all crewmembers are expected to perform a self-assessment of their physical and emotional condition.
- Prescription and over-the-counter medication can seriously affect performance. Flight crewmembers are responsible to self-monitor their condition and to notify the RPIC and/or Chief Pilot when they cannot safely perform flight operations. If it is determined the medication could interfere with the crewmember's tasks, the crewmember will not be assigned to the mission or training event.

All crewmembers are also required to adhere to 14 CFR Part 91.17 and will not be assigned or allowed to perform flight operations under the following conditions:

- Within 8 hours after the consumption of any alcoholic beverage;
- While under the influence of alcohol;
- While using any drug that affects the person's faculties in any way contrary to safety; or
- While having an alcohol concentration of 0.04 or greater in a blood or breath specimen.



## **7. MISSIONS:**

### **MISSION MINIMUM PERSONNEL REQUIREMENTS**

All operational UAS missions and coordinated training events will require a minimum of a RPIC and VO. Under no circumstances will an operational mission be approved or flown with only a RPIC. A person operating a small UAS must:

- Hold a current FAA Remote Pilot certificate, NC UAS Government Operator Permit and be acting as RPIC; or
- Be under the direct supervision of the RPIC who is in a position to take immediate control of the aircraft.

In the event a pilot is still in training (i.e., has not been issued the FAA RP certification and NC UAS Government Operator Permit) and has not been approved to fly missions, the Chief Pilot or another certified RPIC must be present to observe, monitor, and evaluate the trainee.

Where the pilot has obtained the FAA RP certification and NC UAS Government Operator Permit, the RP can conduct flights (nonoperational) to build flight hours and to gain flight proficiency without a VO.

For more complex operational missions that require multiple UAS and crewmembers, the UAS Chief Pilot must be on-scene to assist with the operation and to assist with coordination with the other participating agencies, including the incident commander where applicable.

### **MISSION PROFILES**

All missions will be flown in accordance with FAA regulations, 14 CFR Part 107, applicable portions of 14 CFR Parts 61 and 91, North Carolina General Statutes (NCGS) and local government laws/restrictions pertaining to UAS operations.

**Approved Uses/Missions:** All UAS mission requests shall be authorized by a Division Bureau Chief or their designee(s). Division Bureau Chiefs will coordinate with the Chief Pilot to build a list of missions that will be considered for approval. Listed below are examples of the types of missions for which UAS may be deployed:

- Fatality and accident investigations.
- Various regulatory compliance activities.
- Elevator inspections.
- Amusement device inspections.
- Ski/chair lift inspections.
- Communication tower inspections.
- Wind turbine inspections.
- Explosions.
- Training activities.
- Outreach events.
- Major disaster sites.
- Technical assistance during local/state/federal incidents and emergency situations.



## Unmanned Aircraft Systems Policy and Procedures

This list is not exhaustive, and other types of missions may be flown provided they have been approved by Division Bureau Chiefs or their designee, Chief Pilot, RPIC and Incident Commander. These missions may include being immediately necessary to preserve the health, safety, and welfare of people or property within the state of North Carolina or during a federal response.

### MISSION APPROVAL CRITERIA

1. First Stage: As the first stage of the UAS mission approval process, initial requests for UAS support shall be made to a RP or Chief Pilot. The RP or Chief Pilot will evaluate the mission to provide additional information as part of the approval process. Important approval decision factors include, but are not limited to:

- Is the mission request justified and necessary?
- Is the mission request within the capabilities of the equipment, program and personnel?
- Does the mission fall within federal, state, and local laws, regulations, and policies?
- Can the UAS be deployed safely based on current and forecast weather conditions?
- Are there sufficiently trained and qualified personnel available to safely operate the UAS?
- If the UAS deployment requires a warrant, has one been requested and approved?
- Is there enough information available to make the decision or will a follow up call need to be made to the requestor?
- Determine proximity of critical infrastructure or restricted airspace.

After completing the mission evaluation, the RP or Chief Pilot will either accept or decline the request for UAS support. If the request is denied, a reason will be provided for declining the request. If the RP or Chief Pilot accepts the support request, the District Supervisor and Division Bureau Chief shall be notified and briefed on the mission. After obtaining authorization for the UAS support from the Division Bureau Chief or their designee, the support request will advance to the second stage of the approval process.

2. Second Stage: As part of the second stage of the approval process, a UAS RPIC will be selected and notified. The RPIC will assemble a flight crew which will consist of at least one VO. Other crewmembers could include RPs, PMC, additional VOs and ground support staff depending on the complexity of the mission.

3. Final Stage: The third and final stage of the mission approval process will conclude after conducting the Preflight Operations check. Once the RPIC has confirmed a successful Preflight Operations check, the RPIC will submit for final approval through SafetyDrone and notifying the Chief Pilot (see Section 8, Preflight Operations).

### **8. PREFLIGHT OPERATIONS:**

Preflight activities are the duty of the RPIC before the start of the flight operation. Activities include inspection of the aircraft, hazard assessment of the operating location, establishing AOR, briefing crew members involved in the operation, and equipment checkouts. All flight operations should be conducted in accordance with the provision of 14 CFR Part 107, North Carolina, local regulations, and the operator's instructions/capabilities for the subject aircraft.

Once the RPIC confirms the location is safe to fly and becomes familiarized with the surroundings, the RPIC will document all the details in a preflight report located in SafetyDrone. The flight report serves as an essential piece of documentation associated with the UAS operation, maintenance tracking, pilot flight hours and trend analysis. The preflight report can be filled out prior to arrival at the site as a part of mission planning and is required for all operational missions and organized training events. Once the



## Unmanned Aircraft Systems Policy and Procedures

preflight mission report has been completed, the RPIC will submit the report through SafetyDrone to the Chief Pilot for final mission approval. The RPIC will also contact the Chief Pilot to inform them of the flight request being entered into SafetyDrone.

Once deployed, the assigned RPIC retains final approving authority and may alter or cancel the mission. If a mission is altered or canceled, notification will be made to the requestor and the Chief Pilot.

In the event of a rapid mission deployment, the RPIC will contact the Chief Pilot to inform them of the flight request. After obtaining the final approval, the RPIC will complete the flight report after the mission has been concluded.

### PLANNING

1. The flight crew should be familiarized with all available information pertaining to the flight including, but not limited to; the specific mission/task, take-off/landing, the operational limitations of 14 CFR Part 107, weather conditions, hazards, no fly zones, etc.
2. The RPIC shall conduct an assessment of the operating environment. The assessment must include at least the following:
  - Local weather conditions;
  - Local airspace and any flight restrictions;
  - The location of persons and property on the surface;
  - Establishing the Landing Zone (LZ);
  - In air hazards; and
  - Other ground hazards.
3. North Carolina state statutes require landowner approval before operations take place. It is illegal to launch or recover a UAS from either private or state property without the consent of the property's owner (NCGS 15A-300.2 – Regulation of launch and recovery sites). Local and federal property have their own laws and regulations governing the launch and recovery of UAS. While the state statute allows verbal consent, the RPIC shall attempt to obtain the consent in writing utilizing the Authorization From Property Representative Form (see Appendix 1). The RPIC will include the signed document into the SafetyDrone data management software. If only verbal consent is obtained, the RPIC will include the name, title and date into the notes section of the flight records document in SafetyDrone.

In the event a landowner refuses to give permission to allow launch and recovery from their property, the RPIC will attempt to obtain contact information and the reason for the refusal. The RPIC will notify the Chief Pilot and their supervisor. After consultation between the Chief Pilot, supervisor and Director's Office, a determination will be made whether to discontinue the USA flight mission or to further consult with the Attorney General's Office to initiate the warrant process.

4. RPIC will ensure the location of the LZ for take-off and emergency landing is adequate upon arrival at the location and is adequate for a safe deployment. At least one emergency LZ (secondary LZ area) should be identified before the start of operations. The take-off/landing area should be clearly marked and identifiable with easily seen markers.
5. RPIC and flight crew should be aware of all surroundings in the event that an emergency landing is necessary. This includes the ability to recover the UAS.



## Unmanned Aircraft Systems Policy and Procedures

### WEATHER

1. Weather Brief: Before each flight the RPIC and observer should ensure that they obtain enough information about the existing and anticipated near-term weather conditions throughout the entire local area of operation. As a best practice, they should utilize FAA approved weather resources such as; Meteorological Terminal Aviation Weather Reports (METARS), Terminal Area Forecasts (TAF), etc. from the closest airport reporting weather conditions. In order to obtain the latest and most current weather conditions, Notices to Airmen (NOTAMs), and Temporary Flight Restrictions (TFRs) the RPIC should obtain a local aviation briefing at; 1-800-WXBRIEF or [www.1800WXBRIEF.com](http://www.1800WXBRIEF.com). The RPIC can also utilize a weather mobile app, such as AeroWeather, to obtain weather reports in an effort to review the following: weather radar, ceiling/visibility, wind/temperatures, turbulence, Significant Meteorological Information (SIGMET), NOTAMs, TFRs and icing. In addition, the portable air navigation radios contain an automated weather briefing on channels WX 1-5. Review of NOTAMs and Temporary Flight Restrictions (TFRs) are required prior to launch.
2. Wind direction plays a major factor in flight operations. Operators should take precautions to ensure that wind conditions do not exceed the aircraft limits stated in the aircraft operations manual/specifications. Prior to liftoff, an anemometer should be utilized to better estimate the wind speed and determine if it is within the capabilities of the airframe being flown. The anemometer should also be utilized on a regular basis throughout the duration of the flight to determine deteriorating weather and increased wind speeds in the AOR.
3. The RPIC should ensure that the flight will occur within the weather requirements specified in 14 CFR Part 107.51 (c-d):
  - Visibility - at least 3 statute miles
  - The minimum distance of the small unmanned aircraft from clouds must be no less than:
    - (a) 500 feet below the cloud; and
    - (b) 2,000 feet horizontally from the cloud.

### PREFLIGHT INSPECTION

A preflight inspection is required under 14 CFR Part 107.49 and the RPIC is required to complete a preflight inspection checklist prior to any flight. RPIC should utilize a checklist to ensure the highest level of safety for deployment, which should include the following:

- Required documentation, FAA RP Certificate, NC UAS Government Operator Permit, Aircraft Registration, UAS Flight Manual, Proof of Insurance.
- Weather conditions suitable.
- Check airframe for cracks, signs of damage, all screws are tight and the overall condition.
- Check the propeller or rotor blades for chips, cracks, looseness, damage and any deformation.
- Propulsion system mounting(s) secure.
- Batteries fully charged and securely mounted.
- Check that camera(s) and mounting systems are secure and operational.
- Perform an overall visual check of the aircraft prior to arming any power systems.
- Repair or replace any part found to be unsuitable to fly during the pre-flight procedures prior to takeoff.
- Communications (datalink) check.
- Ensure the GPS module (if any) has GPS "fix."
- Check mission flight plan.



## Unmanned Aircraft Systems Policy and Procedures

“Return Home” and/or “Emergency Landing” locations are selected, located appropriately, and loaded to the Ground Control Station (GCS) and aircraft.

- Ensure sensors are calibrated and that the right setting is loaded.
- Check obstacle sensing system (where applicable) to ensure proper function.
- Ensure anti-collision lights (when required) are operational and secured to the aircraft.
- Complete flight crew briefing.
- Ensure the launch site is free of obstacles.
- Recheck wind direction before launch.
- Confirm phone number for nearest Air Traffic Control facility in event of emergency.

## MAINTENANCE

There are a few parts on the UAS which need servicing or regular maintenance. The manufacturer’s maintenance schedule (if published by the manufacturer) will be followed and documented. Maintenance must be up to date prior to launch. When maintenance is performed, a test flight shall be conducted and documented in accordance with the manufacturer’s instructions. The RPIC will not fly any aircraft that is suspected which does not meet airworthiness requirements following the preflight inspection. Timely maintenance and accurate reporting are required to enhance mission availability and safety. For any UAS which needs maintenance or repair, the RPIC will notify the Chief Pilot and the aircraft will be removed from service until the maintenance or repair has been completed. The RPIC will complete the maintenance request on SafetyDrone.

## PAYLOADS

The RPIC will ensure that no items are attached to the UAS prior to flight that are not required for safe operation or part of the overall mission. All payloads essential to the flight must be secured to the aircraft and checked during the preflight inspection by the RPIC.

## PREFLIGHT BRIEFING

The RPIC, RP, VO and any other flight crewmember must participate in the preflight briefing, led by the RPIC prior to aircraft launch. The RPIC should also include an onsite employer representative and any other individuals participating in the flight operations. The briefing shall include, but is not limited to:

- Review of the mission’s goals and expected outcomes.
- Roles and responsibilities of each person involved in the operation.
- Review of current and forecasted weather conditions.
- Review of current NOTAMs and Temporary Flight Restrictions (TFRs) that have been issued for the proposed flight area.
- Identification of mission limitations and safety issues such as; battery charge, GPS strength, and potential for radio interference and potential site hazards.
- Review of proposed Mission AOR - flight area, including maximum ceiling, floor, and applicable airspace restrictions.
- Review of communication procedures between RPIC, VO, and other flight crew personnel used to support the mission. Including verifying phone numbers used to communicate with Air Traffic Control in the event of a fly-away or other flight emergency.
- Review of emergency/contingency procedures including aircraft system failure, flight termination, divert, and lost link procedures.
- Review of required video or digital images requirements.
- Frequencies to be used.
- Execution of a pre-flight check utilizing an approved checklist.



**The RPIC will be responsible to ensure that the above steps have been accomplished prior to flight.**

**The RPIC is responsible for the safe operation of the UAS and has the overall authority to not conduct the mission or to abort the mission at any time.**

## **9. INFLIGHT OPERATIONS:**

### **SYSTEMS OPERATIONAL TEST**

Prior to conducting 'full flight operations' the RPIC shall conduct a Systems Operational Test to ensure the aircraft, remote controller and all equipment are operating correctly and 'all systems are go'. The test includes the following:

- Ensure the aircraft is properly set up and ready for launch within a safe and open Landing Zone.
- Turn on the mobile device and open the DJI Go App.
- Turn on the remote controller and battery for the aircraft.
- From the DJI Go App, click on device and enter the flight/camera page.
- Wait until the aircraft light indicators blink green and the Home Point has been recorded. If the lights flash yellow, the Home Point has not been established and there could be other errors which should be assessed and corrected.
- Launch the aircraft and hover approximately 5-10 feet.
- Verify the DJI Go App is on and no errors or red indicators are present.
- Activate the video and camera on the remote controller and from the mobile device. Check the gimbal, zoom and focus features to ensure proper recording.
- Rotate the aircraft 360-degrees.
- Test the obstacle sensing system to ensure they are operational.
- Use the controller stick and push left, then right to check the movement of the aircraft on the longitudinal axis.

Should the aircraft not respond to the flight control tests or any error messages are present, the RPIC should immediately land the aircraft and correct the deficiencies. After successful completion of the systems and operational test, the UAS is ready for active 'during' flight operations.

### **DURING FLIGHT OPERATIONS**

All flight crewmembers have the responsibility to ensure flight operations are conducted in a safe manner. The following guidelines should be executed for inflight operations:

- The RPIC should launch, operate, and recover from preset locations so that the aircraft will fly according to the mission plan.
- All flight operations must be conducted using a minimum of a RPIC and VO. Depending on the complexity of the AOR and flight path, additional VOs may be utilized for hazard prevention and air traffic avoidance.
- In accordance with 14 CFR Part 107.31, the RPIC and the PMC or the VO shall maintain VLOS on the aircraft throughout the entire flight.
- In accordance with 14 CFR Part 107.33, the RPIC, PMC and VO shall maintain effective communication with each other at all times to ensure the flight is conducted according to the flight plan.



## **Unmanned Aircraft Systems Policy and Procedures**

- The RPIC position may rotate duties as necessary with equally qualified pilots. The individual designated as RPIC may change during flight.
- The VO should be informed of the actions of the aircraft and the altitude which the aircraft will be operated. The VO's primary responsibility is to assist the RPIC in maintaining situational awareness and alerting the RPIC of unsafe circumstances. The VO will inform the RPIC of possible flight hazards/conditions and recommendations to avoid mishaps and will advise if the abort procedures should be executed.
- Upon any failure during the flight or any loss of visual contact with the UAS, the RPIC should execute emergency procedures in an attempt to have the aircraft return to home, regain signal/control or to avoid serious injury with people (see Section 11, Emergency Flight Procedures).
- The maximum altitude for UAS flight operations shall not exceed 400 feet AGL or, when within 400-foot radius of an obstacle, 400 feet above the uppermost point of the obstacle.
- Prior to the aircraft returning to the landing area, the RPIC should scan the landing area for potential obstruction hazards and recheck weather conditions.
- The RPIC should announce to the observer and any other people around that the aircraft is on final approach and inbound to land.
- The RPIC should always be prepared to reject or abort a take-off or landing, called a "go-around," if the PMC becomes aware that such an operation cannot be safely made due to an unexpected weather situation, emergency, hazard or miscalculation.
- Carefully land the aircraft away from any obstructions and people.

### **10. POST FLIGHT OPERATIONS:**

#### 1. After landing:

- Shut down the UAS and disconnect the batteries.
- Power down the camera or sensors.
- Visually check aircraft for signs of damage and/or excessive wear.
- Verify that mission objectives have been met.
- If imagery or other data are recorded onboard the aircraft during flight, transfer the data as necessary to the Ground Control Station (GCS) or a backup storage device. If all data and imagery is transmitted to the GCS and recorded on the GCS during the flight, then operators may wish to consider backing up the data prior conducting additional flight operations.
- In case there are multiple flights to be conducted, repeat checklist steps to prepare the aircraft for launch again.

2. After all operational flights, the RPIC will perform a post flight review and mission debrief with their team and Chief Pilot. Opportunities for improvement will be documented.

3. An inspection of all equipment will be conducted and any damage or other deficiency found will be noted in the SafetyDrone maintenance tab. The RPIC will notify the Chief Pilot so the equipment can be removed from service and repaired/replaced.

4. Pilot flight time will be synced into SafetyDrone.

Figure 2 on the following page is a sample flight checklist which the RPIC could utilize.



## Unmanned Aircraft Systems Policy and Procedures

FLIGHT CHECKLIST		
PRE FLIGHT	DURING FLIGHT	POST FLIGHT
<b>At office</b> <ul style="list-style-type: none"><li><input type="checkbox"/> Aircraft Documentation</li><li><input type="checkbox"/> NOTAM</li><li><input type="checkbox"/> Local regulations and permissions.</li><li><input type="checkbox"/> Proximity to the airport.</li><li><input type="checkbox"/> Weather condition permits flying.</li><li><input type="checkbox"/> All Batteries Charged</li><li><input type="checkbox"/> Flight Gear check</li></ul>	<b>After launch</b> <ul style="list-style-type: none"><li><input type="checkbox"/> Aircraft reached safe altitude.</li><li><input type="checkbox"/> Confirm observer has the aircraft in sight.</li><li><input type="checkbox"/> All systems green</li><li><input type="checkbox"/> Satellite and GPS check</li><li><input type="checkbox"/> Check Battery remaining</li></ul>	<b>After landing</b> <ul style="list-style-type: none"><li><input type="checkbox"/> Power down UAV</li><li><input type="checkbox"/> Remove and safely store batteries</li><li><input type="checkbox"/> Airframe inspection</li><li><input type="checkbox"/> Check camera/ sensor to ensure data collected</li><li><input type="checkbox"/> Transfer data and flight log</li><li><input type="checkbox"/> Make logbook entry</li></ul>
<b>In the field</b> <ul style="list-style-type: none"><li><input type="checkbox"/> Scan area for obstacles, e.g. take-off and landing area.</li><li><input type="checkbox"/> Wind check</li><li><input type="checkbox"/> Daily Flight Report filled.</li><li><input type="checkbox"/> Assemble UAV, ensure screws are tight and propeller check</li><li><input type="checkbox"/> Sensor/ Camera setting check</li><li><input type="checkbox"/> Batteries securely mounted</li><li><input type="checkbox"/> Ensure GPS fix</li><li><input type="checkbox"/> Confirm Mission flight plan</li><li><input type="checkbox"/> Operators checklist (Integrated)</li><li><input type="checkbox"/> RC remote check (if used)</li><li><input type="checkbox"/> Final airframe inspection</li><li><input type="checkbox"/> Flight Crew briefings, e.g. flight mission and safety</li><li><input type="checkbox"/> Wind check again for launch.</li></ul>	<b>Before Landing</b> <ul style="list-style-type: none"><li><input type="checkbox"/> Ensure UAV flight done according to mission plan.</li><li><input type="checkbox"/> Scan landing area for obstacles.</li><li><input type="checkbox"/> Wind check</li><li><input type="checkbox"/> Observer briefing for landing</li><li><input type="checkbox"/> All systems green</li></ul>	<b>Back at office</b> <ul style="list-style-type: none"><li><input type="checkbox"/> Flight and Maintenance Report</li><li><input type="checkbox"/> Charge Batteries</li><li><input type="checkbox"/> SD card cleaned and ready to use</li><li><input type="checkbox"/> Airframe checked</li><li><input type="checkbox"/> Data processed</li></ul>

Figure 2: Sample Flight Checklist (source: NCDOT UAS Operational Procedures Guide)



## Unmanned Aircraft Systems Policy and Procedures

### **11. EMERGENCY FLIGHT PROCEDURES:**

The safety of all people whether on the ground or in the air is the highest priority during flight operations. Pilots and crewmembers will be trained in emergency procedures to prevent, mitigate and respond to a potentially hazardous situation accordingly. In the event of an emergency involving the safety of persons or property, the RPIC may deviate from the procedures of this policy relating to aircraft, equipment, and weather minimums to the extent required to meet the emergency.

The Department's UAS fleet contains an automated "Return-to-Home" and "Autonomous Landing" mode. These fail-safe mechanisms will be tested during training and operational flights. The RPIC should always be prepared to execute emergency procedure(s) in instances where there is a lost link, loss of GPS, or there are other aircraft or obstructions in the flight path. An emergency avoidance procedure should be determined before landing. These options include land immediately, move to a predetermined location and altitude, or another approach. All possible incursions must be assessed for risk mitigation.

The RPIC will brief the flight crew before the start of the flight operations about emergency procedures and have an alternate mission abort site for landing in the case of an emergency. After the aircraft has safely landed, the incident will be documented for maintenance purposes and the Chief Pilot will be notified regarding the incident.

Possible emergencies and system failures includes:

#### **a) Loss of Datalink Communications**

The UAS lost link procedures shall be initiated which shall automatically cause the UAS to climb to its ceiling altitude and return to and land at the launch site (Return-to-Home). If positive control of the UAS cannot be maintained and the UAS is leaving the operation area or the UAS poses a risk to life and/or property, the RPIC will continue to attempt to reestablish the link and notify the flight crew and ATC. In the event of a lost link during flight, the RPIC will document the lost link in the SafetyDrone flight record.

#### **b) Loss of GPS**

In the event the UAS GPS signal is lost during autonomous operations, the RPIC must switch the UAS into manual mode until GPS signal can be obtained. If GPS signal cannot be obtained, the RPIC will land as soon as practical. If positive control of the UAS cannot be maintained and the UAS departs the AOR or the UAS poses a risk to life and/or property, the RPIC will initiate a rotor/motor stop command.

#### **c) Autopilot Software Error/Failure**

During flight operations, if the SUAS has a software error or failure, the RPIC shall immediately attempt to return the UAS to the landing site or land as soon as practical. In the event the UAS loses signal, or the RPIC cannot control the UAS and it poses a risk to life and/or property, the RPIC will initiate a rotor/motor stop command.

#### **d) Loss of Power, Engine Failure/Crash**

In case of an equipment failure, the UAS will not be able to maintain flight. Flight team members will immediately attempt to locate the UAS, assess the scene for injuries and/or property damage, and notify medical assistance, if necessary.



## Unmanned Aircraft Systems Policy and Procedures

### e) Ground Control System Failure

During flight operations, if the ground control system fails, the RPIC shall immediately attempt to return the UAS to the landing site or land as soon as practical. If connection to the UAS cannot be re-established within a reasonable amount of time determined by the RPIC, then lost link procedures shall be executed in an effort for the UAS to return-to-home.

### f) Intrusion of Another Aircraft into the UAS Mission Airspace

As required by the FAA, UAS operations has to yield to all manned aircraft operations. In the event any type of aircraft (manned and unmanned) enters into the AOR, the RPIC shall immediately take efforts to avoid a mid-air collision and yield to the other aircraft. This could include rapid descension, ascension or lateral positioning. Once the RPIC has executed the avoidance maneuvers, the RPIC shall brief the flight crewmembers on the incident and implement additional "see and avoid warning" procedures to prevent intrusions or to provide greater advance notice of approaching aircraft.

### g) Loss of Visual Contact

If visual contact with the UAS is lost, the RPIC shall initiate the aircraft into a hover mode and the RPIC and/or Visual Observer shall try to re-establish visual contact. If visual contact cannot be re-established within a reasonable amount of time determined by the RPIC, then lost link procedures shall be executed in an effort for the UAS to return-to-home.

### h) Flight Termination

The intentional and deliberate process of performing controlled flight into terrain. Flight termination must be executed in the event that all other contingencies have been exhausted, and further flight of the aircraft cannot be safely achieved, or other potential hazards exist that require immediate discontinuation of flight.

### i) Fly-Away Procedures

In the event of a lost link or fly away, the RPIC should evaluate the airspace affected and contact the appropriate controlling agency (i.e. control tower, airport manager, Center, Restricted Area Agency, etc.) immediately with details of the flight such as; location, direction of flight and approximate altitude, speed and flight time remaining (remaining battery life).

In the event of an emergency, the RPIC should be prepared to submit a written statement on any deviations upon the request of the Administrator (FAA) as outlined in 14 CFR Part 107.21. Best practices suggest that the RPIC fill out a NASA Aviation Safety Reporting System (ASRS), Electronic Report Submission (ERS). More information can be found at: <https://asrs.arc.nasa.gov/overview/summary.html>.

Note: The NASA ASRS system was developed to encourage pilots, aviation maintenance technicians and other personnel to disclose mistakes in a non-punitive format in an effort to advance safety. In exchange for volunteering information, the person reporting the infraction may receive a reduced penalty if the FAA pursues certificate action.

The RPIC will notify the Chief Pilot should any emergencies occur during flight operations. In the event a written statement/report is required to be submitted, the RPIC will provide a copy to the Chief Pilot and the Division Bureau Chief(s) will be notified of the incident.

## **12. FLIGHT BOUNDARIES:**

### **AIRSPACE CLASSIFICATION**

The FAA has exclusive sovereignty over airspace in the U.S. (49 U.S. Code). The FAA establishes operating rules governing the airspace in the form of Federal Aviation Regulations (FARs). These regulations govern all aspects of aviation, such as pilot and aircraft certification requirements. It is important to note that, per federal law, unmanned aircraft are still considered aircraft, and therefore are subject to the FARs administered by the FAA.

The national airspace overlying North Carolina has complex layers of varying controlled access and restrictions. Throughout the state, there are major airports, restricted airspace, military operating areas, warning areas and major sporting venues where certain UAS operations may be affected. It is imperative that the RPIC evaluates the area of operations to ensure they can legally and safely utilize the UAS.

#### 1. Basic Airspace:

Figure 3 depicts the basic types of airspace. All UAS operators should be familiar with the flight requirements in each type of airspace prior to requesting an airspace authorization from the FAA. Airspace authorization applications must include altitudes to be flown and the class of airspace impacted. The FAA provides guidance for each airspace class, as well as other types of airspace such as restricted, prohibited, and military special use airspace on their website.

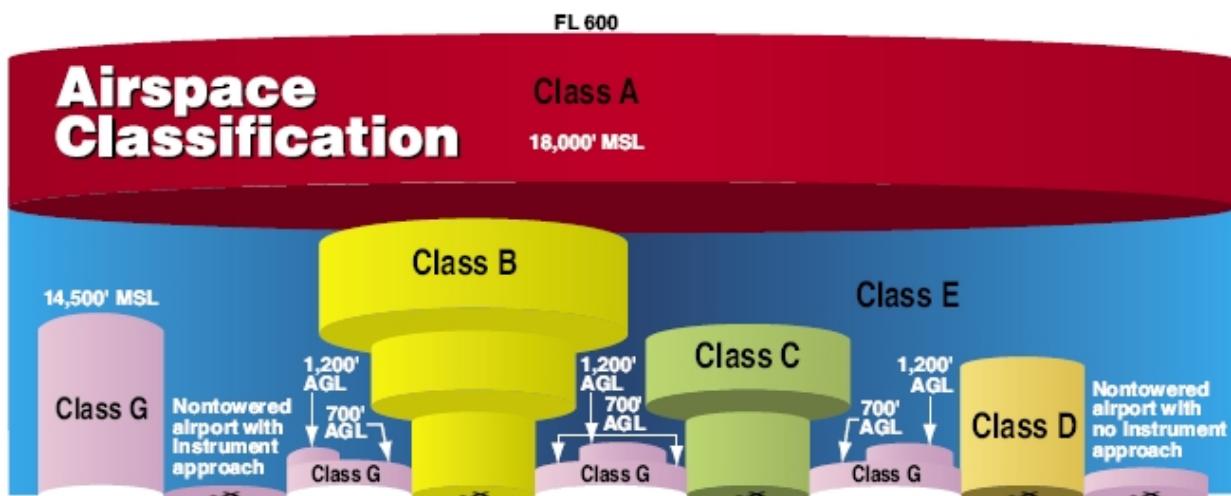


Figure 3 - Airspace Classifications (source: FAA.gov)

## Unmanned Aircraft Systems Policy and Procedures

### 2. Class B, C and D airspace in North Carolina:

Each class of airspace shown in the figure above can be found in North Carolina. The following figure (Figure 4) provides some examples of where Class B, Class C, and Class D airspace can be found in North Carolina.

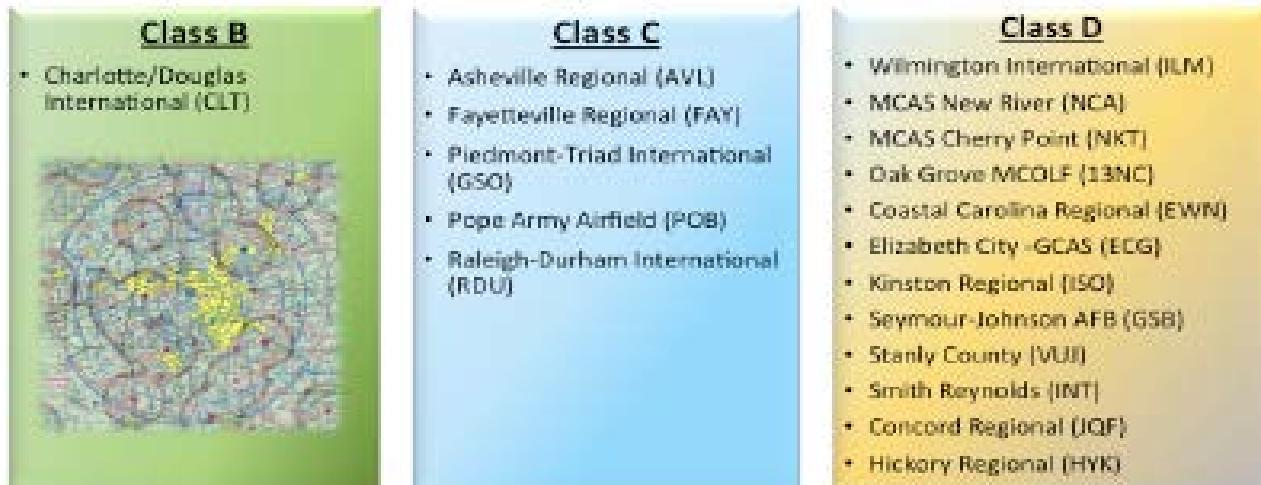


Figure 4- Class B, C and D Airspace (source: NCOT UAS Operational Procedures Guide)

## AIRSPACE RESTRICTIONS

**Restricted Airspace:** Restricted airspaces are defined by specific areas on the earth's surface within which aircraft flight, while not wholly prohibited, is subject to limitations. Frequent low-altitude military aviation operations, including both rotary and fixed-wing aircraft operations, are conducted within this airspace daily. North Carolina contains some of the most heavily used restricted airspace in the U.S. FAA-approved aeronautical charts provide descriptions and altitudes for information about North Carolina's restricted airspaces.

UAS operators should become familiar with the location of restricted airspace and identify contact sources for those areas in which they may wish to operate. Permission for UAS flights in restricted airspace can ONLY be granted by the controlling agency for that particular restricted airspace area.

## Unmanned Aircraft Systems Policy and Procedures

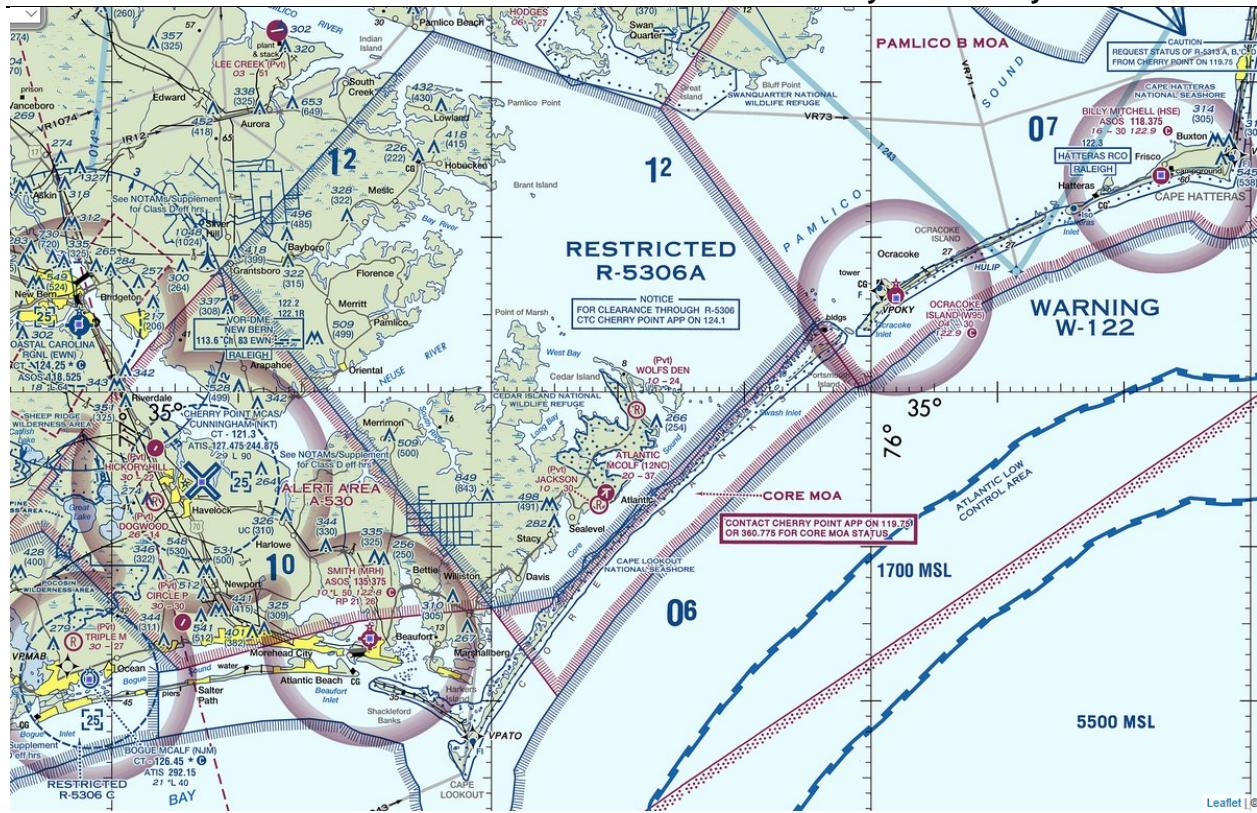


Figure 5- Example of Restricted Airspace in NC

### TEMPORARY FLIGHT RESTRICTIONS

A temporary flight restriction (TFR) is a regulatory action issued by the FAA that temporarily restricts certain aircraft from operating within a defined area in order to protect persons or property in the air or on the ground. The term TFR is used generically to describe various types of restrictions within the NAS.

There are eight types of TFRs used throughout the NAS. Understanding the reasons for each TFR type helps UAS operators recognize the possibility of restrictions effecting their intended flights. For example, Stadium TFRs are issued for sporting events. They go into effect one hour before the event and end one hour after the event and extend 3 nautical miles from the stadium center to 3,000 feet above ground level. They apply to any stadium with a seating capacity of 30,000 or more people when a regular or post-season MLB, NFL, or NCAA Division One football game occurs. They also apply to NASCAR, Sprint Cup, INDY Car, and Champ Series races, excluding qualifying and pre-race events.

Because TFRs are dynamic, it is imperative that UAS operators check on a real-time basis for their locations. TFRs can be found in a number of places, including:

- Online.
- Notice to Airmen.
- Through Air Route Traffic Control Centers (ARTCC).
- Through ATC Facilities.
- Flight Service Stations.



## **BASIC GUIDELINES**

The following basic guidelines will be followed:

- Prior to conducting flight operations, the RPIC will determine the flight boundaries/flight path and area of operation. The airspace classification and alerts will be verified by using FAA's B4UFLY mobile app and aeronautical charts. For non-emergency missions, the airspace classification and alerts can also be verified when planning missions through the SafetyDrone data management program.
- Flight crews are authorized to fly in Class G airspace anywhere throughout the state.
- The maximum altitude for UAS flight operations shall not exceed 400 feet per FAA regulations.
- In accordance with 14 CFR 107.41, No person may operate a small unmanned aircraft in Class B, Class C, or Class D airspace or within the lateral boundaries of the surface area of Class E airspace designated for an airport unless that person has prior authorization from ATC.

There are two methods for obtaining ATC authorization to request flights in controlled airspace:

1. Through the FAA Drone Zone portal; or
2. Through LAANC.

There are two ways to use LAANC:

- To receive a near real-time authorization for operations under 400 feet in controlled airspace around airports.
- To submit a "further coordination request" if you need to fly above the designated altitude ceiling in a UAS Facility Map, up to 400 feet. Applicants may apply up to 90 days in advance of a flight and the approval is coordinated manually through the FAA

Important LAANC Limitations:

- LAANC only accepts airspace authorization requests that are fully compliant with 14 CFR Part 107.
- Airspace authorizations granted through LAANC are valid for 12 hours.
- LAANC authorizations cannot be combined with 14 CFR Part 107 waivers. For example, if you get permission to fly in Class D airspace through a LAANC application, and you already have a waiver to fly at night, you may not combine the permissions to fly in that Class D airspace at night. In order to fly in controlled airspace using your waiver, you must submit a request for an airspace authorization via the [DroneZone](#).

After receiving authorization from the FAA, an authorization number will be sent via text, e-mail or through the mobile device. The RPIC will include this authorization number in the SafetyDrone flight report.

For any UAS mission where FAA authorization is required, the RPIC will complete the flight mission approval process through the SafetyDrone program prior to conducting the flight.

## **13. NOTIFICATION AND PERMISSION FROM AIRPORT AUTHORITIES:**

Operation of a UAS at an airport where ATC authorization is not required will only be conducted with the permission of the airport operator or other appropriate authority. The RPIC can utilize the North Carolina Airport Guide published through the NCDOT Aviation Division for specific airport details and contact information: <https://www.ncdot.gov/divisions/aviation/Pages/nc-airports.aspx>

Another source which the RPIC can utilize for up-to-date airport information is AirNav.com:  
<https://www.airnav.com/>



## **14. EMERGENCY SITUATIONS AND AIRSPACE WAIVERS:**

First responders and others organizations responding to natural disasters or other emergency situations may be eligible for expedited approval through the Special Governmental Interest (SGI) process as outlined in [FAA Order JO 7200.23A](#).

Operations that may be considered include:

- Firefighting.
- Search and Rescue.
- Law Enforcement.
- Utility or Other Critical Infrastructure Restoration.
- Incident Awareness and Analysis.
- Damage Assessments Supporting Disaster Recovery Related Insurance Claims.
- Media Coverage Providing Crucial Information to the Public.

As a public safety and regulatory agency, the Department can apply for the SGI waiver when a mission is deemed urgent and as part of a regulatory compliance function. Examples of these type of situations would include; fatalities/accident investigations, imminent danger conditions, natural disasters and other compliance activity which would impact the safety of individuals.

\*Note: The SGI process would only be applicable when the AOR is located in a restricted airspace and an airspace waiver is not approved under the LAANC notification system.

To apply for a waiver through the SGI process, you must be an existing 14 CFR Part 107 RP with a current certificate OR you must have an existing Certificate of Waiver or Authorization (COA). To submit a waiver through this process, fill out the [Emergency Operation Request Form \(EORF\)](#) (See Appendix 2).

Prior to submitting the waiver or contacting the FAA, the RPIC will notify the Chief Pilot and will complete the flight mission approval process. After receiving mission approval, the RPIC will submit the completed EORF to the FAA's System Operations Support Center (SOSC) at [9-ator-hq-sosc@faa.gov](mailto:9-ator-hq-sosc@faa.gov). If approved, the FAA will add an amendment to your existing COA or Remote Pilot Certificate that authorizes you to fly under certain conditions for the specified operation. If denied, operators should NOT fly outside the provisions of their existing COA or 14 CFR Part 107. Operators have the option to amend their requests. After completing the mission, the RPIC will notify the Chief Pilot that the mission has been completed and the EORF will be closed out. The RPIC will include the EORF in the flight mission records in SafetyDrone.

## **15. GEOFENCE AREAS:**

Geofencing can be defined as some form of automated flight limitation that prevents the UAS from entering a pre-defined area (e.g., airspace around a sensitive facility/location). In other words, a virtual fence around the area or point of interest to prohibit drones from flying in the area. UAS manufacturers can program boundaries (more commonly referred to as zones), which can be locked and the aircraft will not be able to enter or operate in the designated zone or fly with altitude restrictions.

According to DJI, DJI's Geospatial Environment Online (GEO) is a geospatial information system which provide DJI users with up-to-date guidance on areas where flight may be limited due to safety concerns or regulations. DJI's GEO System delineates where it is safe to fly, where flight may raise concerns, and where flight is restricted. GEO zones that prohibit flight are implemented around locations such as airports, power plants, and prisons. They are also implemented temporarily around major stadium events,



## **Unmanned Aircraft Systems Policy and Procedures**

forest fires, or other emergency situations. Certain GEO zones don't prohibit flight but do trigger warnings that inform users of potential risks.

By default, GEO limits flights into or taking off within zones that raise safety or security concerns. If a flight within one of these locations has been authorized, GEO allows users with verified DJI accounts to temporarily unlock or self-authorize their flights. This unlock function is not available for sensitive national-security locations.

As part of the pre-flight planning, the RPIC should check the GEO Zone Map to determine if the AOR is located within a GEO zone that is restricted or locked. In the event the AOR is located in a locked zone, the RPIC will include this information in the comments/notes section of the flight mission report in SafetyDrone. The RPIC will also consult with the Chief Pilot regarding the AOR and locked zone. After completing the flight approval process, the RPIC will access DJI's Flysafe website and complete the 'Unlocking Request': <https://www.dji.com/flysafe>

NOTE: As a public safety agency, the Department can apply for the DJI Qualified Entities Program to minimize the operational restrictions and steps to be taken to unlock the restricted zones. Until the Department has been granted this authorization, the RPIC should continue to utilize the Unlocking Request steps through <https://www.dji.com/flysafe>.

### **16. NIGHT FLIGHTS:**

In accordance with 14 CFR Part 107.29, no person may operate a small unmanned aircraft system during the night. Night is defined as the time between the end of evening civil twilight and the beginning of morning civil twilight. Evening civil twilight is the period of sunset until 30 minutes after sunset. Morning civil twilight is the period of 30 minutes prior to sunrise until sunrise.

All flights within the 30-minute civil twilight period requires the aircraft to be equipped with anti-collision lights that are capable of being visible for at least 3 miles in all directions. For any flights which occurs during the 30-minute civil twilight period, the RPIC will ensure the anti-collision lights are securely mounted to the aircraft and are operational. In the event the anti-collision lights malfunction during flight, the flight will be aborted and the RPIC will immediately return the aircraft home and land. The flight can continue after the civil twilight period passes.

The night-time-operations prohibition in rule 107.29 is waivable through the FAA for 14 CFR Part 107. Until the Department is granted the daylight operations waiver, no missions will be conducted at night.

### **17. FLIGHTS OVER PERSON/PEOPLE:**

In accordance with 14 CFR 107.39 no person may operate a small unmanned aircraft over a human being unless that human being is:

- Directly participating in the operation of the small unmanned aircraft; or
- Located under a covered structure or inside a stationary vehicle that can provide reasonable protection from a falling small unmanned aircraft.

Prior to flight, the RPIC will ensure non-participating personnel will not be in the AOR or will be reasonably protected by a covered structure or stationary vehicle. All people directly participating in the flight operation will utilize head protection while the aircraft is in flight. The RPIC will include this item as part of the mission preflight brief.

The operation over people prohibition in rule 107.39 is waivable through the FAA for 14 CFR Part 107. Until the Department is granted the operation people waiver, no missions will be conducted directly over



## **Unmanned Aircraft Systems Policy and Procedures**

any person or group of people which are not part of the mission or reasonably protected from a falling UAS.

### **18. RADIO AND EXTERNAL COMMUNICATIONS:**

According to AC 107-2 5.8.1, "Unless the flight is conducted within controlled airspace, no notification or authorization is necessary to operate at or near an airport." When operating in the vicinity of an airport, the RPIC must be aware of all traffic patterns and approach corridors to runways and landing areas (AC 107-2 5.8.1, 5.8.1.1, 5.8.1.2). Operations in the vicinity of airports in uncontrolled airspace do not require airport operator/management notification. However, adherence to CFR 107.43 – Operations in the Vicinity of Airports is required. 107.43 states, "No person may operate a small unmanned aircraft in a manner that interferes with operations and traffic patterns at any airport, heliport, or seaplane base." As a result, it is important to allow for additional pre-flight planning time to become knowledgeable about the specific non-towered airport operations.

As a best safety practice, any flight operation within five nautical miles of an airport (also includes heliport) will require the RPIC attempt to notify the airport manager/owner. The RPIC will provide the flight path, estimated flight times and altitude to the manager/owner. The RPIC will include the date(s) of the notification (or attempts), and name of the person contacted in the flight report located in SafetyDrone.

When operating in the vicinity of a non-towered airport within Class G Airspace two-way radio communication with the Common Traffic Advisory Frequency (CTAF) or Unicom is not required under 14 CFR Part 107. However, as a best safety practice, the UAS flight crew will monitor the airport's CTAF or Unicom, and be familiar with airport operations and radio communication procedures. The flight crew will have the local emergency responder's phone number on hand in case of emergencies. The RPIC will include the radio frequencies, emergency telephone numbers and ATC telephone number (when operating within close proximity or within a controlled airspace) in the flight report located in SafetyDrone.

During incidents where helicopters might be operating in the area (Media, Police, Fire, IC, etc.), the RPIC should attempt to monitor the local frequency in an effort to avoid midair collision. The common frequency of 123.025 MHz is authorized for use by helicopters for air-air communications.

For missions where multiple UAS are being operated, the RPIC should notify the Chief Pilot. The RPIC and Chief Pilot will further communicate with the other UAS flight teams/coordinator to ensure flight paths, boundaries and the AOR are identified in an effort to prevent flight mishaps.

### **19. REGULATORY COMPLIANCE:**

All flights, regardless if operational or training, shall comply with all applicable federal, state, and local laws and regulations. All flights will be conducted following all applicable FAA regulations pertaining to the operations and certification of small Unmanned Aircraft Systems including 14 CFR Part 107.

### **AIRCRAFT REGISTRATION**

All UAS operated by Department personnel must be registered in accordance with current FAA 14 CFR Part 107 regulations. Registration requirements apply to UAS owned and operated by the Department as well as UAS on loan or UAS owned by outside agencies when operated by a Department RPIC.

The RPIC will ensure the registration marking is placed on the exterior of the aircraft and is legible prior to conducting flight operations. The Chief Pilot will maintain a list of the registration numbers of each UAS.



## **ADDITIONAL FAA COMPLIANCE**

The program will also comply with any additional information or regulatory requests from FAA to include, for example:

- Any document, record, or report pertaining to:
  - (a) Aircraft registration.
  - (b) Flight records.
  - (c) Incident reports.
  - (d) Deviation from regulations.
  - (e) Authorization from ATC.
  - (f) Waiver from specific provisions (as appropriate).
- FAA may require upon request, to test or inspect:
  - (a) Aircraft.
  - (b) The remote pilot-in-command or person manipulating the flight controls.
  - (c) Visual observer.
- Accident Reports

## **20. ACCIDENT INVESTIGATION AND REGULATORY NOTIFICATION:**

### **ACCIDENT INVESTIGATION**

The Chief Pilot and Director's Office will immediately be notified of any incidents involving personal injury or damage to any property. In the event of any UAS accident, regardless if it meets the FAA threshold for a reportable accident, the RPIC will notify the Chief Pilot. In addition, any incidents which the FAA, NTSB or other regulatory agencies becomes involved, the RPIC shall immediately notify the Chief Pilot. The Chief Pilot will notify the Division Bureau Chef, Director and Commissioner's Office to inform them of the requested activity by outside agency. The Chief Pilot will assist the RPIC with the requesting agency's inquiry and any reporting requirement.

The RPIC will be required to complete an accident investigation report and submit to the Chief Pilot. The UAS will be removed from service until the accident investigation has been completed. The RPIC will be 'grounded' and will not be able to serve in the capacity as the RPIC for additional missions until the completion of the accident investigation and corrective actions have been implemented if required.

### **FAA ACCIDENT REPORTING**

1. Prior to any notification to the FAA or NTSB, the RPIC will notify the Chief Pilot and Director's office.
2. In accordance with FAA 14 CFR Part 107 the RPIC, within 10 days, must submit an accident report to the FAA in which any of the following conditions apply during a flight:
  - Serious injury to any person or any loss of consciousness; or
  - Damage to any property, other than the small unmanned aircraft, unless one of the following conditions is satisfied:
    - (a) The cost of repair (including materials and labor) does not exceed \$500; or
    - (b) The fair market value of the property does not exceed \$500 in the event of total loss.

The accident report can be submitted various ways to the FAA:



## Unmanned Aircraft Systems Policy and Procedures

- DroneZone (<https://faadronezone.faa.gov/#/>)
- Regional Operations Center (ROC) electronically ([https://www.faa.gov/uas/report\\_accident/](https://www.faa.gov/uas/report_accident/))
- Telephone to the local ROC. The ROC for North Carolina is: (404) 305-5156.

The ROC Reports may also be made to the nearest jurisdictional Flight Standards District Office ([https://www.faa.gov/about/office\\_org/field\\_offices/fsdo/](https://www.faa.gov/about/office_org/field_offices/fsdo/)). The report should include the following information:

- RPIC's name and contact information;
- RPIC's FAA airman certification number;
- sUAS registration number issued to the aircraft, if required (FAA registration number);
- Location of the accident;
- Date of the accident;
- Time of the accident;
- Person(s) injured and extent of injury, if any or known;
- Property damaged and extent of damage, if any or known; and
- Description of what happened.

### NTSB ACCIDENT REPORTING

1. In accordance with 49 CFR 830.5, the RPIC shall immediately notify the NTSB of an accident or incident. An unmanned aircraft accident is defined in 49 CFR 830.2 as an occurrence associated with the operation of any public or civil unmanned aircraft system 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;
  - The aircraft has a maximum gross takeoff weight of 300 pounds or greater and sustains substantial damage.
2. 49 CFR 830.2 also provides definitions of what constitutes "serious injury" and "substantial damage". Operators must consider that the rest of the reporting requirements for serious incidents listed in 49 CFR 830.5 apply regardless of UAS weight. Listed serious incidents that apply to all UAS include the following events:
  - Flight control system malfunction or failure: For an unmanned aircraft, a true "fly-away" would qualify. A lost link that behaves as expected does not qualify.
  - Inability of any required flight crewmember to perform normal flight duties as a result of injury or illness. Examples of required flight crewmembers include the pilot, remote pilot; or visual observer if required by regulation. This does not include an optional payload operator.
  - Inflight fire, which is expected to be generally associated with batteries.
  - Aircraft collision in flight.
  - More than \$25,000 in damage to objects other than the aircraft.
  - Release of all or a portion of a propeller blade from an aircraft, excluding release caused solely by ground contact.

Contact the NTSB's 24-hour ROC at 844-373-9922 to file a report. A phone call is sufficient initially, but a written follow-up may be required.

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



## **Unmanned Aircraft Systems Policy and Procedures**

- Type, nationality, and registration marks of the aircraft;
- Name of owner, and operator of the aircraft;
- Name of the pilot-in-command;
- 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.

### **21. PERSONAL EQUIPMENT:**

Each member of the flight crew will be responsible for wearing appropriate clothing and having the correct equipment with them while on duty. The following are some of the guidelines that should be followed:

- The UAS flight crew should always wear eye and head protection while conducting operational missions and the UAS is in flight.
- Although there is no specific uniform required to use for proper operation of the UAS, the flight crew should take necessary measures to deploy in a professional manner and take into consideration that all deployments are subject to viewing by the public or media at deployment locations.
- The UAS flight crew will wear high visibility vests with the designated role they will be conducting during flight operations (i.e., Certified Remote Pilot, Visual Observer, Flight Team, etc.).
- A Cellular phone should be brought to a mission in the event to call for medical assistance, Departmental leadership, or to notify various regulatory agencies should the need arise.
- FAA rules do not allow visual aids other than corrective glasses for keeping the UAS within line of sight, although not permitted for flight operations, a set of binoculars may be carried and used to scan the sky and surrounding area for obstructions or other hazards. They are not permitted to be used by flight crews during flight operations.

### **22. DATA MANAGEMENT AND REPORTING REQUIREMENTS:**

#### **IMAGES and VIDEO**

Images and video captured during flight are stored on the UAS internal storage medium. The storage medium is inserted during the pre-flight process and removed after each flight. The RPIC should ensure the storage medium has adequate space/memory prior to the flight. In addition, extra/spare storage medium should be part of the equipment list for all flights.

Protection and safeguarding of the imagery data collected during the flight operation is the responsibility of the RPIC and VO. The following items should be adhered to:

- The storage medium should only be handled by the RPIC or VO.
- The storage medium will be secured by the RPIC or VO.



## **Unmanned Aircraft Systems Policy and Procedures**

- The captured images and video should be transferred to a laptop, DVD or other device in an effort to back-up the data and maintain for historical purposes and as part of the investigative process.

During joint operational missions where the flight team is being deployed to assist other agencies and the Department does not have regulatory compliance activity (i.e., deployed under the state EOC for hurricane damage assessments, etc.), the RPIC or VO should consult with the requesting agency UAS Manager or Incident Commander to determine the image and video storage and transferring procedures/process.

All images and video collected using unmanned aircraft will be managed in compliance with the agencies' established records retention and public release polices for the specific division (i.e., OSH or EAD).

### **FLIGHT LOG AND DOCUMENTS**

1. Flight Log Software: The RP shall be responsible for maintaining their individual flight records, hours, certifications and other data in SafetyDrone.
2. The RPIC is responsible for completing a flight log following every UAS flight including operational missions, maintenance checks and training flights. If the situation of the mission does not allow for immediate entry of the flight data into SafetyDrone, then the information shall be recorded within 5 days.

### **23. PROGRAM REVIEW AND AUDIT:**

The UAS Program will be periodically reviewed to incorporate any revisions due to federal, state, or local legislative, regulatory, or policy revisions, operational assessments or best practices. In an effort to ensure the UAS Program is fully compliant with federal, state and local regulations and the UAS flight team expands on flight skills and proficiency, the Chief Pilot will schedule an annual audit of the UAS program and policy. The review process will include at least the following:

- Pilot flight logs and maintenance logs.
- Maintenance review of all aircraft, equipment and spare parts.
- Applicable FAA waivers.
- UAS Operational Policy and Procedures.
- Review of training conducted.
- Review of missions completed.
- Biennial FAA Remote Pilot's Certification and NCDOT UAS Permit.
- Complete UAS equipment inventory.
- UAS FAA Registration.

Upon completion of the audit, a written report will be submitted to the flight team and division directors for review and any required corrective measures to be implemented.



## Unmanned Aircraft Systems Policy and Procedures

### **24. REFERENCES:**

- Final Rule of FAA 14 CFR Part 107 (Federal Aviation Administration Small UAS Rule):  
<https://www.federalregister.gov/documents/2016/06/28/2016-15079/operation-and-certification-of-small-unmanned-aircraft-systems>
- FAA Advisory Circular (AC) 107 – 2:  
[https://www.faa.gov/documentlibrary/media/advisory\\_circular/ac\\_107-2.pdf](https://www.faa.gov/documentlibrary/media/advisory_circular/ac_107-2.pdf)
- FAA UAS Website:  
<https://www.faa.gov/uas/>
- FAA UAS Emergency Situations:  
[https://www.faa.gov/uas/advanced\\_operations/emergency\\_situations/](https://www.faa.gov/uas/advanced_operations/emergency_situations/)
- FAA Order JO 7200.23A:  
[https://www.faa.gov/regulations\\_policies/orders\\_notices/index.cfm/go/document.information/documentID/1031453](https://www.faa.gov/regulations_policies/orders_notices/index.cfm/go/document.information/documentID/1031453)
- FAA Operations Support Center (SOSC) email:  
[9-ator-hq-sosc@faa.gov](mailto:9-ator-hq-sosc@faa.gov).
- FAA DroneZone:  
<https://faadronezone.faa.gov/#/>
- NTSB:  
<https://www.ntsb.gov/Pages/default.aspx>
- DJI:  
<https://www.dji.com/flysafe>
- NCDOT Division of Aviation Website:  
<https://www.ncdot.gov/aviation/uas>

### **NC Authorities**

- NCGS 15A-300.1(Restrictions on use of UAS)
- 15A-300.2 (Regulation of launch and recovery sites)
- 15A-300.3 (Use of UAS near a confinement or correctional facility prohibited)
- 14-7.45 (Crimes committed by use of UAS) 14-280.3 (Interference with manned aircraft by UAS)
- 14-401.24 (Unlawful possession and use of UAS (weapon attached))
- 14-401.25 (Unlawful distribution of images)
- 113-295 (Unlawful harassment of persons taking wildlife resources)
- 63-94 (Applicability of Article),
- 63-95 (Training required for operation of UAS)
- 63-96 (License required for commercial operations)

**APPENDIX 1:**

**NC Dept.of Labor**  
901 Blairhill Road Suite 200  
Charlotte 28217 NC US

## **Authorization From Property Representative Form**

I hereby grant permission to the North Carolina Department of Labor, to include the Occupational Safety and Health Division and/or the Elevator and Amusement Device Bureau, to fly over the property referenced below for the purposes of collecting data for analysis by the North Carolina Department of Labor, to which I and and/or my representatives will have access to pursuant to the applicable North Carolina General Statutes.

**Property Address:** **Street Name**

**City:**

**State:**

**Zip:**

**Full Name:** John Smith

**Phone:** 111-111-1111

**Email:** john.smith@xyz.com

**Date:** \_\_\_\_\_  
(Representative)

**Signature:**

## APPENDIX 2:

# 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 14 CFR 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 flown under 14 CFR Part 107, please provide the 14 CFR 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) <b>Mandatory entry</b>	
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)	
Requested altitude of UAS flight: <b>Mandatory entry</b>	
Enter GIS details defining location of proposed flight (only one area type description needed) <b>Mandatory entry</b>	
For those flights remaining within a general contiguous area, which can be described as a circular polygon, provide the latitude and longitude, expressed as <b>degrees/minutes/seconds</b> , 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 <b>degrees/minutes/seconds</b> , 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 <b>degrees/minutes/seconds</b> , 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)	

<u>Nature and Description of Event</u>		
Enter the type of urgent UAS operation to be flown		Description of event
<input type="checkbox"/>	Firefighting Law Enforcement Search and Rescue	
<input type="checkbox"/>	Local / National / Natural Disaster	
<input type="checkbox"/>	Other (specify below)	

<u>Additional Pilot Qualifications</u>		
Enter additional pilot qualifications		
<input type="checkbox"/>	Sport/Recreational/Private pilot certificate	

<input type="checkbox"/>	Commercial/Airline pilot certificate
<input type="checkbox"/>	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**.

## **UAS Policy and Procedure Version Control**

<b>REVISION DATE</b>	<b>VERSION</b>	<b>ACTION/DESCRIPTION</b>	<b>AUTHOR/ APPROVED BY</b>
March 2018		Initial SOPs	Lee Peacock
June 01, 2020	1	Revised/documenting Department SOPs	Lee Peacock