YONKERS FIRE DEPARTMENT

STANDARD OPERATING GUIDELINES

Emergency Operations

TITLE: CITY OF YONKERS FIRE DEPARTMENT UAS STANDARD OPERATING PROCEDURE

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Purpose:

This UAS Operations Manual ("Manual") describes the City of Yonkers Fire Department's small Unmanned Aircraft Systems operations in the National Airspace System ("NAS") and related safety considerations. Throughout this manual, The City of Yonkers Fire Department is referred to as YFD and small Unmanned Aircraft Systems shall be referred to as UAS. These procedures are intended to promote safe and efficient operation of UAS. This manual has been prepared for the use and guidance of flight, ground operations and management personnel as a requirement of City of Yonkers FD FAA Section 333 Grant of Exemption, its FAA Certificate of Authorization ("COA"), Certificate of Waiver ("Waiver"), or other FAA authorization. It has been designed for the use of working with and around UAS and vendors providing UAS support services to the YFD. This manual is intended to be a convenient source of company policy and includes instructions and information necessary to allow personnel to perform their duties safely. Although the arrangement of this manual is intended to increase UAS in-flight capabilities, it should not be used as an occasional operating reference. YFD Firefighters and vendors providing UAS-related support services should study the entire manual to familiarize themselves with the limitations, procedures and operational handling characteristics of the UAS before participating in any flight operations under this manual. This manual does not address every possible contingency that may arise or every rule of safety and good practice. Specific rules, procedures and guidelines contained herein are considered to be minimum requirements. All YFD personnel shall comply with all applicable Federal Aviation Regulations ("FARs"), state and local laws and the rules set forth in this manual. While great care has been taken to ensure that this manual does not conflict with the conditions and limitations prescribed in FAA Part 107, grant of exemption, waiver, or other FAA authorization, in the event of a discrepancy, the conditions and limitations contained in the grant of exemption, and/or waiver, shall take precedence and must be followed. This manual, including any revised documents, shall be made available to the administrator upon request.

1. Manual Amendments and Revision Control

The Fire Commissioner or his designee and UAS Program Admin shall control this manual and its amendment procedure. The UAS Program Admin will prepare and track revisions for this manual. Each revision will contain a revision number and date and indicate the page number(s) being revised. Revisions will be consecutively numbered. All revisions will be in the form of complete page changes or additions. The Fire Commissioner or his/her designee shall be responsible for revising and disseminating changes to this manual. Once a new version is issued, no prior versions may be used, and any such copies must either be updated to the current version or destroyed. It is the responsibility of all holders of this manual to ensure its currency prior to conducting UAS operations.

UAS team members shall present updated and revised documents to the UAS Program Administrator if it petitions for an extension or amendment to its grant of exemption when the extension or amendment alters the material basis upon which the grant was made.

If any questions arise regarding updates or revisions to this manual, YFD UAS Firefighters will contact the FAA's UAS Integration Office (AFS-80) at the following number: (202) 267-8306.

2. Reference Documents

A non-exclusive list of documents that may be used for reference by the YFD UAS personnel is set out in Appendix F.

3. Unmanned Aircraft Systems

When flying in the NAS, YFD flight personnel will only operate small UAS weighing 55 pounds or less, in accordance with 14 C.F.R. Part 107. If operations are being conducted under authority of a Certificate of Waiver, or under similar FAA grant of authority, then operations shall be limited to the make and model of the vehicles authorized for use under that Waiver or similar authority.

3.1 UAS Airworthiness Requirement and Pre-Flight Inspection

Prior to each flight, the Remote Pilot-in-Command ("RPIC) shall inspect the UAS in accordance with the Manufacturer's Manual. The pre-flight inspection shall be performed prior to every flight. Over time, vibration may cause hardware to loosen or become worn. If the inspection reveals a condition that may affect the safe operation of the UAS, the aircraft is prohibited from operation until the necessary maintenance has been performed and the UAS is found to be in a safe condition.

If there is any doubt that the UAS is safe to fly, the vehicle **shall not be flown.**

3.2. UAS Registration and Markings

All UAS operated by the Yonkers Fire Department must be identified by serial number, registered in accordance with 14 C.F.R part 47, and have identification (N-number) markings in accordance with C.F.R part 45, Subpart C. Markings must be as large as practicable.

3.3 UAS Control Frequency

Before conducting operations, the radio frequency spectrum used for operation and control of the UAS must comply with Federal Communication Commission ('FCC") or other appropriate government oversight agency requirements.

3.4 Manufacturer Manuals

To the extent required by the FARs or other FAA authorization, all UAS shall be operated in accordance with the requirements of the applicable Manufacturer's Manual. The term "Manufacturer's Manual" shall include all relevant manufacturer publications for the UAS vehicle, including, but not limited to:

- Flight Manuals;
- Operations Manuals;
- Pilot Operating Handbooks;
- Component Maintenance Manuals;

- Service/Safety Bulletins;
- Service Information Letters.

For additional information regarding Manufacturer's Manuals, see Reference Materials in ***Appendix F*.**

4. Flight Team Members (YFD UAS)

The Fire Commissioner or his/her designee shall insure that all Flight Team members are fully qualified to perform their duties safely and effectively. The UAS Program Admin will evaluate the qualifications of individual Flight Team members based on their experience with the UAS being operated, which will be verified through written, oral, and/or practical examination. The UAS Program Admin will maintain training records for all Flight Team members.

The UAS Program Admin may rely upon prior training and experience for purposes of qualifying Flight Team members, to the extent that prior training and experience meets the minimum requirements of this manual, including being logged in a manner consistent with 14 C.F.R.§ 61.51(b). The UAS Program Admin will retain documentation of prior training and experience used to qualify Flight Team members in accordance with the record-keeping requirements in Section 13 of this manual.

YFD UAS Unit members and employees shall notify their supervisor or other responsible leadership if they observe any work practices (by pilots, other employees or contractors) that are considered unsafe or in violation of safety rules and regulations.

Flight Team Members:

4.1 Remote Pilot:

The Remote Pilot of the UAS shall be the RPIC who has all the responsibility and authority of the PIC as described by 14 C.F.R. 91.3, *Responsibility and Authority of the Pilot in Command.*

4.1.1 Pilot Duties and Responsibilities:

- The Remote PIC has ultimate responsibility for the safe operation of the UAS. As a result, the Remote PIC has the final decision on whether to initiate or terminate any flight.
- Pilots will evaluate all proposed UAS operations. On occasion, pilots may be asked to perform a mission that, in their judgment, is not safe. It is the pilot's responsibility to recognize and refuse all such missions. The pilot's word is final as to whether the flight is feasible and can be conducted in a safe and efficient manner.
- Before departure, the pilot must understand the mission request and have all applicable maps, charts and manuals at the ground control station. Additionally, the pilot is required to be aware of weather forecasts, winds, hazards, temporary flight restrictions, and all pertinent information necessary to perform the mission.

4.1.2 Remote Pilot Qualifications:

The Remote PIC must have a remote pilot certificate with a small UAS rating issued pursuant to subpart C of 14 C.F.R. Part 107, or any other certificate or license required by the FARs for the operation being conducted. The RPIC will be responsible for the oversight of the whole UAS flight mission. Including preflight checks.

Prior to conducting operations under this manual, the Remote PIC must demonstrate the ability to safely operate the UAS in a manner consistent with how the UAS will be operated for the intended operation.

The Remote PIC shall maintain an understanding of the normal, abnormal and emergency procedures of the UAS.

The Remote PIC shall maintain an appropriate level of understanding of the FARs applicable to the airspace where UAS operations will occur.

No one may act as Remote PIC unless they have read and familiarized themselves with the contents of this manual, as well as the Manufacturer's Manual, for the UAS to be flown.

4.1.3 Remote Pilot Currency Requirements:

It is the responsibility of the Remote PIC to ensure that he/she has current experience with the UAS used in any flight operation.

4.2 Visual Observer

4.2.1 Visual Observer Duties and Responsibilities:

To the extent required by applicable FARs or other FAA authorizations, one or more Visual Observers will be used when required by FAA Rule or Regulation or when it is determined that an Observer will provide a benefit to the operation.

The Visual Observer has a crucial role to fulfill in any mission to assist the Remote PIC in maintaining situational awareness and comply with his "see-and-avoid" duties. Observer(s) must maintain sufficient proximity to the Remote PIC and to the flight operation to exercise "see-and-avoid" activities by scanning the area around the UAS for potentially conflicting traffic or other hazards to the safety of the flight.

The Observer will maintain contact with the Remote PIC at all times and be able to advise the Remote PIC of any hazards that arise during flight. Electronic messaging or texting is not permitted during normal flight operations.

The Observer shall maintain visual contact with the aircraft and maintain diligent visual lookout for any airborne or ground-based threats in accordance with 14 C.F.R. § 107.31, or other FAA requirements.

If a UAS tether is used, the Observer shall scan the area around the tether for hazards that could entangle the tether or otherwise cause hazards to the safety of the flight.

4.2.2 Visual Observer Qualifications:

Observers shall have sufficient knowledge of the airspace in which the mission detailed in this manual will be performed to permit them to adequately assess the risks posed by other aircraft for objects.

Observers shall maintain a thorough understanding of all normal, abnormal, and emergency operational aspects of the UAS.

No one may act as a Visual Observer unless they have read and familiarized themselves with the contents of this manual as well as the manufacturer's manual for the UAS to be flown.

4.3 Senor Operator

During UAS operations that might require more complex aerial work, and when the sensor (camera systems, gimbal) requires the use of a Sensor Operator, the Remote PIC will be assisted by a Sensor Operator. The Sensor Operator will be responsible for remotely controlling the movements of the camera systems on-board the UAS. In addition, in case of emergency or incapacitation of the Remote PIC, the sensor operator will be trained and competent to take over the controls of the UAS to safely land the vehicle.

The Sensor Operator does not have the authority to require the Remote PIC to maneuver the aircraft in any unsafe manner or any manner that violates the FARs.

No one may act as a Sensor Operator unless they have read and familiarized themselves with contents of this manual, as well as any additional manuals for the specific sensors to be operated.

4.4 Radio Communications Officer/Firefighter

The Radio Communications Officer/Firefighter will be responsible for all radio communications from the RPIC/UAS Unit to the command post or to the The Fire Commissioner or his/her designee.

5. Flight Planning/Preparation

The RPIC and Drone Unit Team shall examine the feasibility of the any flight mission and consider all pre-flight planning steps necessary to safely execute the assignment. If appropriate, the RPIC/ The Fire Commissioner or his/her designee shall consult with the City of Yonkers legal department.

5.1 Assessment of Proposed Mission Location

A pre-flight survey (Flight Risk Matrix) form located in ***Appendix D*** and will be located in the UAS forms binder. This provides a list of issues to consider that may impact the flight operation and mission including:

- Types of airspace, restricted flight areas
- Hazards associated with industrial sites or such activities as live firing, gas venting, high-intensity radio transmissions, etc.
- Local laws or ordinances
- Obstructions
- Public access areas
- Appropriate permission from landowner(s) for take-off and landing, where required
- Likely operation site and alternative sites
- Forecasted weather conditions in the area of the proposed operations.

Before conducting flight operations, the RPIC shall:

- Check UAS mobile mapping apps for any Temporary Flight Restrictions prior to flight.
- Check for the issuance of any NOTAMs prior to flight as required or as directed in the applicable COA.

- Asses the location of the mission. This includes gathering information about the mission location, including population density and geographical location (GPS coordinates).
- Utilize authorized Mobile UAS mapping apps and FAA-published aeronautical sectional charts to determine the location and proximity of any nearby airports or heliports.
- Notify Westchester County Police aviation of the current operation if necessary.
- Coordinate and de-conflict between Military Training Routes ('MTRs").
- Determine the existence of other possible hazards to flight. Ex: Overhead wires, towers, poles, chimneys, trees, and vehicle traffic.
- Determine the existence of any local ordinances, laws or regulations which may impact the proposed UAS mission. If necessary, take reasonable steps to notify and / or obtain permission for the proposed operations form the local authority.
- Determine appropriate steps to be taken for the safety of any persons entering into the area of the proposed flight operations.
- Identify alternative emergency/abort landing sites.
- Review weather conditions by consulting weather forecast.
- File any NOTAMs with a local FAA Tower (Westchester County, LGA, JFK etc.)
- Process a LANCC request if the operation is in controlled airspace

5.2 Site Permission

If required by the FAR or other FAA authorizations, the YFD or its intermediary will obtain necessary permission from private landowners for take-off and landing sites

5.3 Weather

Local weather must be checked prior to on-site deployment to ensure wind speeds/precipitation/temperature or other environmental factors will not adversely affect the safety of the operation. This information should then be re-checked during the onsite survey prior to take-off. Wind velocity and direction will be checked on-site prior to flight. VFR Weather minimums will be obeyed at all times.

6. Sterile Area and Airspace Control

6.1

The UAS may not be operated less than 500 feet below or less than 2,000 feet horizontally from a cloud or when visibility is less than 3 statute miles from the RPIC

Unless otherwise authorized by the FAA, no UAS operations will occur in Class B, Class C, Class D airspace or within the lateral boundaries of the surface area of Class E airspace designated for an airport without prior authorization from Air Traffic Control.

The UAS must remain clear and yield the right-of-way to all other manned aviation operations at all times (including but not limited to, ultralight vehicles, parachute activities, parasailing activities, hang gliders, etc.). The UAS will land as safely possible upon identification of any manned operation in the immediate vicinity of UAS operations.

The UAS shall not be operated in FAA prohibited or restricted areas unless permission from the using or controlling agency, as appropriate, has been obtained.

If the operation is to take place in controlled airspace around airports during the daytime between 8am and 6pm a LAANC (Low Altitude Authorization and Notification) Request via an authorized UAS App will be submitted to the controlling airport by the PIC for that operation.

Unless otherwise authorized by the FAA, the operation of any other UAS model shall be in accordance with FAR § 107.39- Operation over human beings.

6.2 See and Avoid/Visual Line-of Sight ("VLOS")

All flight operations shall be conducted in accordance with the line of sight ("VLOS") requirement of 14 CFR § 107.31. This requires that, with vision that is unaided by any device other than corrective lenses, the RPIC, Observer (if one is used), and the person manipulating the flight control of the UAS (if different from the Remote PIC) be capable of seeing the UAS throughout the entire flight in order to:

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

Throughout the entire flight of the UAS, VLOS capability must be exercised by either the RPIC, or the person manipulating the flight controls of the UAS (if different than the RPIC), or Observer. All flights must be conducted during the daylight hours in visual meteorological condition ("VMC") and flights under special visual flight rules ("SVFR") are not authorized.

6.3 Take-Off and Landing Zones

All operations require YFD Flight Team members designate a take-off zone, landing zone, and lost link/emergency termination zones; however, the RPIC retains the right to change or modify that selection of potentially unsafe conditions exist. These zones maybe the same location or different locations, depending on the needs of the mission. Where deemed necessary and appropriate by YFD Flight Team Members will take necessary actions to advise all non-essential personnel and nonparticipating persons to remain at least 10 feet laterally away from the landing zone while the UA is taking off or landing.

6.4 Site Selection

The landing zone shall provide sufficient space to safely land and launch the aircraft in accordance with procedures in the Manufactures Manual. The landing zone shall be as safe and secure as possible. To the extent possible, the zones should be free of any obstacles or hazards to the safe conduct of the flight, including but not limited to:

- Trees or tall brush;
- Fences;
- Large rocks;
- Towers;

- Poles;
- Overhead wires;
- Dust and small pieces of debris
- Dust and small of debris
- Fresh Snow (snow can be tamped down).

When possible, locate landing areas so that take-offs and landings may be made into the prevailing winds.

7. Normal Flight Operations

A normal flight operation is any flight that is not conducted for training or maintenance purposes. All flight operations shall be conducted in accordance with the requirements of an applicable COA, Waiver, FAA Part 107 or any other FAA authorization. Normal Flight Operations are limited to speeds at or below 87 knots (100mph). The RPIC is prohibited from beginning a flight (considering wind and forecast weather conditions) unless there is enough available power to the UAS to operate for the intended operational time. The RPIC has the final say if flight operations are possible when considering flight risks. The UAS may not be operated above 400 ft above ground level ("AGL") unless it is flown within a 400- foot radius of a structure, and does not fly higher than 400- feet above the structure's immediate uppermost limit.

7.1 Drone Unit Response Team Member Positioning

The following factors should be considered when positioning Team Members:

- Visual coverage of the operating site;
- Position in relation to the sun to avoid visual impairment;
- Physical obstacles such as overhanging trees, rocks, buildings, power lines, etc.;
- Terrain topography, avoid steep slopes or uneven ground;
- Effects such as wind shear from nearby trees, buildings etc.;
- Proximity to buildings and structures

7.2 Flight Team Briefing

If the Remote PIC deems it appropriate, he/she may initiate a flight team briefing. Suitable topics for discussion at the briefing include:

- Abnormal/Emergency procedures and how they will be applied to the specific mission;
- The roles and responsibilities of the RPIC, Observer, Sensor Operator, Radio Communications Officer for the specific mission;
- The communication plan;
- The contingency plan
- Weather reports;
- Proximity to the potential air traffic;
- Abort parameters in accordance with the Manufacture's Manual;
- Threats to the current mission
- Use of radio communications between team members to Command.
- Emergency operations procedures

- Alternate landing locations due to an emergency

7.3 Documentation

All maintenance and alterations must be properly documented as required by the FAA. All necessary documentation must be kept with or accessible by the RPIC during normal flight operations, including:

- Applicable Manufacturer's Manuals;
- This SOG
- YFD UAS Deployment Procedures
- UAS Registration
- Any FAA approved departmental waivers
- Copy of COA (Certificate of Authorization)
- Remote Pilot Part 107 Certificate
- Mission Logs
- YFD UAS Binder

7.4. Take-Off/Flight

All flight operations will be conducted in accordance with the Manufacturer's Manual and all FAA Part 107 Rules and Regulations. All Flight Team members shall remain at their station during take-off, landing, recovery, and any other critical phases of flight, except when performing those duties required for the safe operation of the aircraft. The UAS may not be operated by the RPIC from any moving device or vehicle unless the UAS is being operated over a sparsely populated area.

7.5 Recovery

All UAS landing and recovery will be accomplished in accordance with the Manufacturer's Manual and YFD Emergency procedures. The UAS landing and recovery will take place at the designated landing zone.

7.6 Shutdown / Post-Flight

UAS shutdown and post-flight actions will be taken in accordance with the Manufacturer's Manual. A YFD Flight team member shall complete a post-flight summary form (mission log), which shall include:

- Date of Operation
- Flight Location (GPS Coordinates)
- Department who requested the YFD UAS unit (a point of contact for that dept who info from the mission can be delivered to)
- Mission/Project Name
- Remote Pilot in Command Name and Pilot's license number
- Observer Name
- Sensor Operator Name
- Radio Communications Officer/Firefighter Name
- Launch and Recovery Times
- Duration of Operation
- Any NOTAMS filed/LAANC Requests that were processed
- Any SGI or waivers

Any issues encountered during the operation should be addressed before subsequent operations. The RPIC or and YFD Team Member shall be responsible for documenting and reporting accidents or incidents in accordance with FAR 107.9 other FAA requirements.

8. Abnormal and Emergency Flight Operations

The recommended procedures for addressing various types of emergencies and critical situations are provided by this section and in the manufacturer's manual. These procedures are suggested as the best practice for coping with the particular conditions described but are not a substitute for sound judgement and common sense. RPICs and all YFD Flight Personnel engaged in UAS operations under this manual should familiarize themselves with procedures given in this section and the Manufacturer's Manual and be prepared to take appropriate action should an emergency arise.

8.1 Emergency Procedures

The RPIC will abort the UAS flight in the event of unpredicted obstacles or emergencies. Response to emergency situations shall be conducted in accordance with this manual and the Manufacturer's Manual.

In an emergency situation involving the safety of persons or property, which requires immediate decisions and actions, the RPIC or any other appropriate YFD Flight Team Member may take action that is considered necessary under the circumstances to ensure safety.

If, for any reason, the UAS needs to conduct and emergency landing, YFD Flight Team members will take actions to immediately warn people on the ground below where the UAS is operating and alert the RPIC of any potential hazards so that the RPIC can take appropriate action to ensure safe operations of the flight.

YFD Flight Team members must also immediately warn people on the ground below where the UAS is operating of any potential hazards associated with the UAS flight operation. Flight Team members may deviate from prescribed operations procedures and methods, weather minimums, FARs, this manual, etc. to the extent necessary, in the interest of safety. The RPIC shall keep the appropriate ATC facilities fully informed when and in-flight UAS emergency could potentially impact operations of aircraft in navigable air space.

8.2 Systems Failures

Response to abnormal systems incidents related to the UAS shall be conducted in accordance with the predetermined, site-specific contingency plans and abort procedures for emergency flight termination, as well as any additional guidance provided by the Manufacturer's Manual. Systems failures shall be documented in the Aircraft Flight Log in ***Appendix E*** or in an equivalent electronic format.

8.3 Lost-Link Procedures

If the aircraft loses communications or loses its GPS signal, the aircraft is equipped with failsafe hardware that allows the aircraft to "Return to Home" (RTH) and land from its original launch location. Lost-link response procedures will be in accordance with the predetermined, site-specific contingency plan and abort procedures for emergency flight termination, as well as any additional guidance provided by the Manufacturer's Manual. Lost-links shall be recorded in the Aircraft Flight Log in ***Appendix E*** or in and equivalent electronic format.

9. Training Flights

Before performing any UAS operations described in this manual, Remote Pilots, Observers, Sensor Operators, and all YFD Drone Unit Response Team members must complete required training to FAA Part 107 Standards. Training can

include but is not limited to online courses, in-house classes, training articles, hands on flights, training of different UAS platforms, NYS Classes, FAA Classes/ Webinars, training missions, and RPIC operator competency courses to NIST Course to NFPA 2400 Standards. Training flights are intended to afford employees the ability to safely work around a UAS and identify and mitigate risks and potential hazards that could be encountered during UAS flight operations. Training flights are performed for the sole purpose of either gaining experience flying UAS in general or in meeting current requirements for specific UAS used by the YFD Drone Response Unit for operations under this manual.

All training flights shall occur during designated training sessions on private property that is either owned or controlled by the City of Yonkers or on third-party property with the consent of the owner/controller. All training flights are subject to the sterile area and airspace control requirements in Section 7 of this manual. A pilot may operate a UAS under this Section for training purposes, even if he or she does not meet the training requirements for acting as a RPIC during UAS operations performed under this manual.

10. Accident Reporting

10.1 FAA Reporting

YFD flight team members will report accidents to the FAA in accordance with FAR 107.9 or otherwise required by the FAA.

10.2. NTSB Reporting

YFD flight team members will report unmanned aircraft accidents, as the terms defined in 49 C.F.R. Part 830.2 (*e.g.*, an accident in which any person suffers death or serious injury *1*), to the NTSB's 24-hour Response Operations Center at (844)-373-9922 and shall provide the following information:

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

11. Maintenance Procedures

Maintenance, whether scheduled or unscheduled, on components used in the operation of the UAS, shall be performed in accordance with the appropriate manufacturer's recommendations in the Manufacturer's Manual and the provisions of this Section.

All maintenance performed on an aircraft shall be documented and recorded in the Aircraft Flight Log, including any malfunctions encountered, parts removed, parts replaced and whether the aircraft is airworthy after any maintenance procedure. The UAS maintenance Log entry shall contain:

- Date the work was performed
- Make, model, and serial or N-number of the aircraft
- Maintenance technicians name
- Aircraft total time

- Details of work performed
- Details of any modifications to the aircraft
- Details and total time of any replacement components
- Details of any malfunctions encountered
- Status of the aircraft once maintenance procedures are completed
- Any other matter affecting the aircraft's readiness for flight.

[1] *Serious injury* means any injury which: (1) Requires hospitalization for more than 48 hours, commencing within 7 days from the date of the injury was received; (2) results in a fracture of any bone (except simple fractures of fingers, toes, or nose); (3) causes severe hemorrhages, nerve, muscle, or tendon damage; (4) involves any internal organ; or (5) involves second- or third-degree burns, or any burns affecting more than 5 percent of the body surface. 49 C.F.R § 830.2.

11.1 Maintenance Technicians

The name of the Maintenance Technician performing the work shall be listed on all maintenance documents maintained by the YFD Drone Response Unit.

11.2 Functional Test Flights

Any maintenance action or altercation performed that affects the aircraft's operation or flight characteristics, e.g., replacement of a flight-critical component, must undergo a functional test flight in accordance with this manual. Test flights will comply with all provisions of this manual. The RPIC who conducts the functional flight test must make an entry in the Aircraft Flight Log. Depending on the work performed, flight-critical components may include:

- Airframe/Structural components
- Flight controller or Autopilot/Stability Systems
- Radio Transmitters
- Radio Transmitter Antennas
- Power Distribution Boards
- Power Wiring Harnesses
- Servo Wiring or Flight Controller Wiring
- Motors
- Actuators or Servos
- Controller Hardware, Software or Firmware

12. Recordkeeping

The YFD flight team members will maintain documentation off all UAS activities conducted under the provisions of this manual as required by the FAA. All documentation shall be made available for review upon request by the the Fire Commissioner or his/her designee. All records required under this manual will be either accessible by YFD Team members electronically or maintained at YFD SOC offices, which are currently located at the following address:

460 Nepperhan Avenue
Yonkers NY, 10701

12.1 Aircraft Flight Log

The following items shall be documented in the Aircraft Flight Log:

- Record of all flight operations
- Lost-Link Incidents
- System Failures
- Test Flights

All flights records will be synced with the manufacture's software if available.

12.2 Flight Team Member Records

YFD flight team members will maintain individual qualification, training, and current records for all flight team members. Aircraft Flight Logs may be used to satisfy flight team members' record-keeping requirements.

12.3 Inspection and Maintenance Records

The YFD Flight Team will maintain records for all UAS inspections and maintenance activities Sample Maintenance Log can be found in ***Appendix C.***

12.4 Electronic Record Keeping

The forms provided in the appendix to this manual are intended as a general guide for the type of information that should be kept. The actual paper forms do not need to be utilized and personnel can use any electronic recordkeeping system that the YFD Flight Team has designated as appropriate for the use in recording and storing this information.

13. Public Privacy and Citizen Complaints

13.1 Policies and procedures to safeguard individual's privacy and civil liberties

UAS operators and observers ensure the protection of private individuals' Fourth Amendment Rights, civil rights and reasonable expectations of privacy before deploying the UAS. UAS operators and observers ensure and are held accountable for ensuring that operations of the UAS intrude to a minimal extent upon private property, persons and businesses. To accomplish this primary goal, Yonkers Fire Department observes the following:

- Agencies shall only collect information using UAS, or use UAS-collected information, to the extent that such collection or use is consistent with and relevant to an authorized purpose. Authorized uses include, but are not limited to fires, hazardous material incidents, search and rescue, fire department operations, homeland security, and infrastructure security.

- Yonkers Fire Department UAS will record video and still pictures of features on the ground or structures that relates to public or private property involved in an ongoing incident. Any data captured outside the focus of flight operations is unintentional or only as necessary due to the proximity of the property.

- When the UAS is flown, the onboard cameras are to be turned so as to be facing away from occupied structures, etc. as much as practicable to minimize inadvertent video or still images of uninvolved persons or property.

- When asked by a member of the public to delete personal data about him or her

that has been gathered, after advising The Fire Commissioner or his/her designee of such request, do so, if possible, and will not interfere or hinder investigation of the incident.

- Yonkers Fire Department does not conduct random surveillance activities. The use of the UAS is tightly controlled and regulated and not in any way intended to document the activity of private citizens.

- Hovering over private property shall be kept to a minimum or only as necessary to accomplish the goal of an individual flight operation.

- Whenever possible, the UAS crew should divert sensors from occupied structures and uninvolved persons to minimize inadvertent, unapproved data collection.

- Any UAS flight open to misinterpretation by the public should be avoided. The following are examples of flights that would be considered controversial:

    - Flights of routine nature for which commercial or other public transportation or ground based data gathering could be more economically substituted.

- In summary, all UAS operators and assigned crew members should make every reasonable effort not to invade the public's privacy in the execution of UAS work. All federal, state, and local regulations should be adhered to, and as required, the public should be notified before UAS operations.

- Data oversight and auditing procedures will be conducted by The Fire Commissioner or his/her designee for the Yonkers Fire Department. Audits will be conducted once a year, or as necessary by request of the Fire Commissioner or his/her designee, or other authorized parties

- The City of Yonkers will ensure data-sharing agreements or policies, data use policies, and record management policies applicable to UAS conform to all applicable laws, regulations, and policies

- All data gathered will be reviewed for any inadvertent intrusion to privacy. If found, reasonable efforts will be made to ensure that such information will be permanently masked or obscured within the data files prior to the release of photos or video internally within Yonkers Fire Department, other City agencies, or to the public. Information collected using UAS that may contain PII shall not be retained for more than 180 days unless retention of the information is determined to be necessary to an authorized mission of the retaining agency

- Information shall only be shared with authorization from the Fire Commissioner or his/her designee to authorized parties. During emergency incidents data shall be shared with authorized agencies by request of the Incident Commander of the incident.

- Any sUAS operated by the Yonkers Fire Department will be available by request to other agencies. Stipulations on use include weather, the type of mission, and any safety or privacy concerns discerned by the Remote Pilot in Command.

- Reporting of the UAS will follow local, state and federal documentation requirements. This includes Pilot licensing information and training, an equipment maintenance reports, Flight and mission data, incident response data through the department's incident reporting software, audits of video or still

footage, and any other reporting as deemed necessary to the program. These reports will be collected and reviewed by the Fire Commissioner or his/her designee annually.

- The Yonkers Fire Department shall create an annual report of UAS operations available to the public by request. This report shall include a description of the types of missions flow, number of flights, and the number of times the Yonkers Fire Department assists other agencies.

- Policies and procedures pertaining to the sUAS program will be reviewed by the Yonkers Fire department at a minimum of every 3 years. Changes to any policies or procedures will follow the departments policy of approval. Policies and procedures must conform to FAA guidelines, and the presidential memorandum *Promoting Economic Competitiveness While Safeguarding Privacy, Civil Rights, and Civil Liberties, in Domestic Use of Unmanned Aircraft systems*

- The public shall be informed of sUAS use whenever possible. Due to the nature of emergency operations if this is not feasible to inform the public immediately the remote pilot in command will exercise extra caution to provide privacy to the public as stated above.

- Except for those instances where safety or investigations could be jeopardized, and where reasonably possible and practical, the public shall be notified in the area of the flight, either through the City of Yonkers website, social media outlets, or press releases

- Agencies shall only collect information using UAS, or use UAS-collected information, to the extent that such collection or use is consistent with and relevant to an authorized purpose. Authorized uses include, but are not limited to fires, hazardous material incidents, search and rescue, fire department operations, homeland security, and infrastructure security.

13.2 Procedures for Citizen Complaints

Any complaint received during operation of the UAS will be addressed by the Remote Pilot in Command, or highest-ranking department officer on scene. The Fire Department Member receiving the complaint will exercise all possible remedies to provide reasonable expectation of privacy and safety to the citizen. If the citizen is unsatisfied with the measures taken by the members the member will instruct the citizen to contact the Deputy Chief of Personnel via phone at 914-377-7500. The Deputy Chief of Personnel will follow department procedures for formal citizen complaints.

Additionally, the citizen can fill out the department's Complaint and Referral form found in the Appendix and can be obtained at Yonkers Fire Department Headquarters at: **470 Nepperhan Avenue (2ND FL), Yonkers NY, 10701.**

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APPENDIX A

INCIDENT LOG

Assign Incident Report Number and Complete
Incident Detail Report Log

INCIDENT #	Date of Incident	Flight NO.	Incident Location	Personal Injury Y/N	Property Damage Y/N	Equipment Damage

APPENDIX B

Incident Detail Report Log

Describe what action was taken and who was the incident reported to

INCIDENT #	DATE OF INCIDENT	INCIDENT LOCATION	FLIGHT NO	PERSONAL INJURY		PROPERTY DAMAGE		EQUIPMENT DAMAGE	
				YES	NO	YES	NO	YES	NO

DESCRIBE IN DETAIL THE TYPE OF INCIDENT, INURY AND/OR DAMAGE

APPENDIX C

MAINTENANCE LOG		
DATE:	**JOB NUMBER:**	**TECH NAME:**
DJI MAVIC 2 DUAL ENTERPRISE | | | TOTAL FLIGHT HOURS:		
Reason for Maintenance:		
Description of Maintenance Performed:		
Parts Removed/Replaced (If condition is not new, include total time on replacement parts)		

Flight Test Required? **Yes NO**	**If Yes, Pilot Name / Cert. No**
Approved for Flight? **Yes NO**	**If not approved for flight, Closeout Actions Required:**

Signature:	**Notes:**

APPENDIX D

UAS Mission Checklists						**Mission #:**	
Mission Checklist							
☐	Airport(s) Notified:		☐	UAV Batteries Charged		☐	Gimbal Protector Installed
☐	Location is OK to fly			Battery 1 volts:		☐	Propellers Packed
☐	Weather Forecast OK			Battery 2 volts:		☐	Cables Packed
	Temperature:			Battery 3 volts:		☐	Camera Filters Packed
	Wind:			Battery 4 volts:		☐	Sun Shade Packed
	Precipitation:		☐	Controller Charged		☐	Tools Packed
☐	Firmware up-to-date		☐	Tablet Charged		☐	Flight Plan designed/entered in software
☐	MicroSD Card Formatted		☐	Mobile Phone Charged		☐	Log Book Packed

Launch Site Checklist				
☐	Verify Weather is OK to Fly		☐	Check for obstacles, interference
	Temperature:		☐	Check for nearby human activity/dangerous situations
	Wind:		☐	Verify Launch Pad is down-wind from observers
	Precipitation:		☐	Launch Pad/Barriers Placed
☐	**Safety Briefing**			

Equipment Checklist					
☐	Airframe/Landing gear inspected	☐	SD Card Installed	☐	Gimbal/Lens Protector Removed
☐	Propellers Inspected/Attached	☐	Battery Installed	☐	Camera Filters Installed
☐	Controller/Tablet Assembled				

Pre-Flight Checklist			
☐	Aircraft Placed on Launch Pad	☐	Check RC battery level
☐	Turn on Remote Controller/Tablet/DJI Pilot App	☐	Check Aircraft Battery Level
☐	Antennas Properly Positioned	☐	Check flight mode switch (P-Mode)
☐	Turn on Aircraft	☐	Check Satellite and Compass status
☐	Check the aircraft status LEDs	☐	Set RTH Location and height
☐	Verify the gimbal is level, can move unobstructed	☐	Check camera settings

Take-Off Checklist			
☐	Check launch site is clear for take off	☐	Make sure the aircraft is stable while hovering
☐	Start the motors	☐	Check flight controls, make sure they respond as expected
☐	Take off and hover	☐	Start recording video

Post Flight Checklist					
☐	Remove Battery from Aircraft	☐	Install Gimbal Guard	☐	Repack all equipment
☐	**Complete the Flight Log**				

APPENDIX E

# YONKERS FIRE UAS FLIGHT LOG	**Mission #**

Mission/Flight Plan			
Pilot Name:		RP Cert. #:	
Address:		Phone:	
Visual Observer(s):			
Location:			
Date:		Aircraft Type/Name:	
Planned Time:		Aircraft Certificate #:	
Estimated Mission Duration:		Mission Type (VFR, IFR):	
Airports within 5 miles:			
Waivers Applied for:			
Mission Description/Route:			

Mission/Flight Record			
Flight 1	Takeoff Loc:	Launch Time:	Flight Notes:
	Landing Loc:	Landing Time:	
	Battery # ____ Voltage: ____	Elapsed Time:	
Flight 2	Takeoff Loc:	Launch Time:	Flight Notes:
	Landing Loc:	Landing Time:	
	Battery # ____ Voltage: ____	Elapsed Time:	
Flight 3	Takeoff Loc:	Launch Time:	Flight Notes:
	Landing Loc:	Landing Time:	
	Battery # ____ Voltage: ____	Elapsed Time:	
Flight 4	Takeoff Loc:	Launch Time:	Flight Notes:
	Landing Loc:	Landing Time:	
	Battery # ____ Voltage: ____	Elapsed Time:	
Mission Notes:			

APPENDIX F

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

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

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

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 requested UAS operation will be flown under Part 107, please provide the Part 107 Pilot License number below.

Requested Flight Details	
Enter the date(s) of the proposed UAS operation (e.g., 03/18/2018 or 03/18/2018-03/21/2018) Mandatory entry	
Enter the times of the proposed UAS operation (be sure to confirm time zone; e.g., 1200L-1400L daily) Mandatory entry	
Enter the location of the proposed flight (reference the nearest city or town, and state; e.g., Gulfport, MS)	
Enter the distance and direction from the nearest airport, and FAA identification of the same (e.g., 6 NM W of GPT)	
Identify the class(es) of airspace in which the flight will be conducted (e.g., Class G/E/D/C/B/A)	
Requested altitude of UAS flight: Mandatory entry	
Enter GIS details defining location of proposed flight (only one area type description needed) Mandatory entry	
For those flights remaining within a general contiguous area, which can be described as a circular polygon, provide the latitude and longitude, expressed as **degrees/minutes/seconds**, of the center of that area and the radius of that same area (e.g., XX:XX:XXN / XXX:XX:XXW - .25NM radius)	
For those flights remaining within a general contiguous area, which cannot be easily described as a circular polygon, provide the latitude and longitude, expressed as **degrees/minutes/seconds**, of the vertices of the general area starting with the most northerly point and then progressing clockwise (e.g., (XX:XX:XXN / XXX:XX:XXW; XX:XX:XXN / XXX:XX:XXW; XX:XX:XXN / XXX:XX:XXW)	
For those flights following an extended route, provide the latitude and longitude, expressed as **degrees/minutes/seconds**, of the key waypoints of the route, and, as appropriate provide the width of the route (e.g., XX:XX:XXN / XXX:XX:XXW; XX:XX:XXN / XXX:XX:XXW ; XX:XX:XXN / XXX:XX:XXW ; XX:XX:XXN / XXX:XX:XXW - .25NM wide)	

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

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

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

APPENDIX G

Mayor Mike Spano — City of Yonkers

Anthony Pagano
Fire Commissioner

YONKERS FIRE DEPARTMENT
470 Nepperhan Avenue, 2nd Floor
Yonkers, NY 10701
Tel. 914.377.7525
Fax 914.377.7566

Complaint and Referral

Date:		Fire Prevention ID#:	

Complaint Information:			
Complainant/Referred By:			
Address:		Apt #:	
Block / Lot:			
Contact Number:			
Email:			

Complaint Description:

Complaint Recorded by:			
Rank/Title:		Name:	

The above complaint was recorded with Yonkers Fire Prevention and is being forwarded to your jurisdiction as indicated below. Please cause an investigation to be made and return this form with the results.

☐ Yonkers Fire Station #_____	☐ Dept. of Housing & Buildings	☐ Other Agency
Person Notified:		

Portion below to be completed by the Inspector or Agency

Results/Findings:

Rank/Title:		Date:	
Name (print):			
Signature:			

FD150- REV 04/20

APPENDIX H

References:

- FAA Aeronautical Information Manual (AIM): https://www.faa.gov/air_traffic/publications/media/AIM_Basic_4-03-14.pdf
- FAA Airplane Flying Handbook (FAA-H-8083-3B): https://www.faa.gov/regulations_policies/handbooks_manuals/aircraft/airplane_hand book/media/FAA-H-8083-3B.pdf
- FAA UAS COA Online System: https://ioeaaa.faa.gov/oeaaa/Welcome.jsp
- Federal NOTAM System: https://pilotweb.nas.faa.gov/PilotWeb/
- Downloadable FAA VFR Raster Charts: https://www.faa.gov/air_traffic/flight_info/aeronav/digital_products/vfr/
- FAA Aircraft Certification Registration Forms: http://www.faa.gov/licenses_certificates/aircraft_certification/aircraft_registry/aircraf t_regn_forms/

USER GUIDES:

DJI MAVIC ENTERPRISE DUAL:

https://dl.djicdn.com/downloads/Mavic_2_Enterprise/Mavic_2_Enterprise_User_Manual_EN.pdf

DJI TELLO

https://dl-cdn.ryzerobotics.com/downloads/Tello/20180212/Tello+User+Manual+v1.0_EN_2.12.pdf