

PUMA AE SMALL UNMANNED AIRCRAFT SYSTEMS (SUAS)
STANDARD OPERATING PROCEDURES (SOP)
FOR
FENTRESS NALF, VIRGINIA

1. **INTRODUCTION.** This document covers SUAS operations at the Fentress NALF, VA. The SUAS addressed in this SOP are the Puma AE UAS Category as defined by the Joint Concept of Operations for Unmanned Aircraft Systems (JUAS CONOPS) dated November 2008. This SOP will be used in conjunction with an approved Federal Aviation Administration (FAA) Certificate of Waiver or Authorization (COA) for operations at NALF Fentress.

One Pilot in Command (PIC) must be designated at all times and is responsible for the safety of the Unmanned Aircraft (UA) and persons and property along the UAS flight path. The PIC may be a Vehicle Operator (VO) or Mission Operator (MO). The PIC will be held accountable for controlling their aircraft to the same standards as the pilot of a manned aircraft. The provisions of 14 CFR 91.13, Careless and Reckless Operation, apply to UAS pilots.

2. **DEFINED AREA.** Unmanned Aircraft System (UAS) operations at Fentress NALF will be conducted within a 2.5 nm radius from the center of the runway from the surface up to but not including 1000 feet AGL. Operations will be conducted a maximum of 3 times a week, 8 hours per session. Operations will be conducted in VMC during the hours of sunrise to sunset. Visual observers will remain in contact with the PIC and will be positioned so that they remain within 1.0 nautical miles horizontally and 1000 feet vertically of the UAS during all operations.

3. **FLIGHT SCHEDULING.** UAS operations within Fentress NALF Class E airspace will be scheduled a minimum of 24 hours prior with Oceana NAS Approach Control Facility Air Ops Officer on Duty at (757) 433-2162/2163. At the same time, the PIC will coordinate with Oceana NAS Base Operations to request a NOTAM be issued detailing UAS activity within the Fentress NALF Class E airspace to include mission dates and times. Oceana NAS Base Operations contact number is: 757-443-2162/2163. The schedule shall include, at a minimum, the following for each flight:

1. Takeoff time (all times local)
2. Estimated land time
3. FM Net call sign of observer: (_____)
4. Observer name or initials
5. Observer cell phone number (back-up comm.)

4. **FREQUENCY AUTHORIZATION AND DECONFLICTION.** A list of frequencies that will be utilized will be provided to the Oceana NAS Approach Control Facility and the

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DOD Regional Air Frequency Coordinator (DSN 342-1194/1532, FAX DSN 342-1200) for deconfliction and approval.

5. **FENTRESS NALF PROCEDURES.** The PIC, Observer, or designated team lead will pick-up FM net radio from the Oceana NAS Approach Control Facility. The same individual will verify that Oceana NAS Approach Control personnel have the flight schedule for that day's UAS operations and that a NOTAM has been issued. The same individual will also conduct a radio check one-hour prior with Oceana NAS Approach Control to ensure the radio is operational, and loud and clear. Communications will be maintained throughout the operation. SUAS operators shall comply with all ATC instructions and restrictions. The operator shall maintain all SUAS operations within the confines of the approved COA airspace as defined. Operations shall avoid populated areas or heavily trafficked roads. All operations will be conducted between sunrise and sunset in VMC and operators and observers shall maintain visual contact with the UAS at all times.

6. **PRE-FLIGHT BRIEFINGS.** Prior to any SUAS operations, the PIC will conduct a crew and safety briefing. The briefing will include, at a minimum, the following:

- A. **Mission overview.**
- B. **Weather.** (current and forecasted)
- C. **Flight route/area.** Ensure Fentress NALF operations area is loaded in FalconView.
- D. **Airspace surveillance procedures.**
 - 1) Pilots responsibilities.
 - 2) Observer's responsibilities.
 - 3) Pilot responsibilities in the event of ATC notification of observed aircraft in vicinity of UA operations not in two-way communication.
 - 4) Pilot/Observer responsibilities when they observe an aircraft in vicinity of UA operations.
- E. **Required items, mission equipment, and personnel.**
- F. **Crew actions, duties, and responsibilities.** (Modes of flight, who will make radio calls, identification of recovery team, etc.)
 - 1) Emergency actions.
 - 2) Mission considerations and actions to be performed by VO/MO.
- G. **General crew duties.**
 - 1) Vehicle Operator (VO).
 - a. Fly the air vehicle.
 - b. Avoid traffic and obstacles.
 - c. Cross check display symbology, messages, wind velocity/ direction.
 - 2) Mission Operator (MO)
 - a. Assist in traffic and obstacle avoidance.

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- b. Manage radios.
- c. Navigate.
- d. Cross check display symbology, messages, wind velocity/direction
- e. Read and complete checklist items as required.
- f. Set/adjust pages/switches and systems as required.
- g. Note takeoff time.
- h. Log events
- i. Calculate and monitor times for holding and approaches. When on approach, watch for the air vehicle. Be prepared to direct the VO for a missed approach procedure, if required.
- j. When visual is acquired direct VO to the ground if needed.

3) Observer

- a. Must remain within 1 nautical mile horizontally and 1000 feet vertically of the UAS during all operations.
- b. Must keep the UAS in sight at all times.
- c. Maintain two-way contact with the VO/MO to warn of potential hazards.
- d. Provide VO/MO with instructions to steer clear of any potential collisions.

H. **Analysis of the aircraft.** Logbook and preflight deficiencies.

I. **Risk assessment considerations.**

J. **Comments:** Instructor, Mission commander, Crew member, Observer questions, comments, and acknowledgment of the mission briefing.

7. **PRE-FLIGHT PROCEDURES.** SUAS are particularly sensitive to adverse weather conditions such as moderate to blowing sand and dust, rain, severe turbulence, storms and lightening, and wind gusts. SUAS operators will be responsible to routinely check current and forecasted conditions. It will be the responsibility of the PIC to ensure weather conditions do not exceed system limitations as described in Operator's Manual. All flight operations will be conducted in Visual Meteorological Conditions (VMC) under Visual Flight Rules (VFR). The PIC will complete the Preflight checklist in Operator's Manual.

8. **LAUNCH and FLIGHT.** The PIC will complete, at a minimum, the following:

- A. Follow procedures outlined in the Operator's Manual.
- B. Inform Oceana NAS Approach Control Facility via FM Net that the SUAS is airborne.
- C. SUAS shall remain within COA airspace of the Fentress NALF (fig 1).
- D. Operations will be conducted over a non-populated area.

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Figure 1. Puma AE UAS operations area / Fentress NALF Class E Airspace

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Figure 2. Puma AE operations area / Fentress NALF surrounded by farmland.

9. POST FLIGHT PROCEDURES. The PIC will complete, at a minimum, the following:

- A. Notify Oceana NAS Approach Control Facility upon completion of each sortie.
- B. Inventory and account for all equipment
- C. Report any discrepancies
- D. Conduct a visual and functional equipment inspection
- E. Complete an entry to the flight log
- F. Last flight of day. Notify Oceana NAS Approach Control Facility upon completion of daily activities.

10. EMERGENCY PROCEDURES. Preventing a mishap or SUAS loss or damage depends on early recognition of dangerous flight conditions or malfunctions followed by appropriate corrective action. Both the VO and MO will memorize the immediate action items of each emergency procedure outlined in the Operator's Manual. Mission planning must include alternative courses of action available for each phase of the proposed flight. To the extent possible, planned courses of actions for emergencies should be made before the flight begins to include ensuring the Rally waypoint (in the event of loss-of-link) and waypoint "E" (for routine landings) are within the designated COA airspace. During flight,

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both operators must maintain situational awareness and VO should always know which direction to fly to escape hazard. MO: Should always know UA position relative to hazards and be ready to give VO headings and altitudes to fly to safety. Those steps that must be performed immediately in an emergency are underlined and in bold print in the Operator's Manual. The operators must be able to perform these steps without referencing the checklist or manual. Non-underlined steps can be accomplished with use of the checklist. During an emergency, the PIC will complete, at a minimum, the following:

- A. Follow procedures outlined in Operator's Manual.
- B. Immediately notify Oceana NAS Approach Control Facility Air Ops Officer on Duty at (757) 433-2162/2163 and advise them of the nature of the emergency situation and/or any other pertinent information.

11. LOST LINK PROCEDURES. The UA will be programmed "go-to rally" and autoland. The "rally" point will be located over the Ground Control Station (GCS) within approved COA airspace. A secondary option is available to the UA operator to program the UA to "End Flight" upon lost-link which will cause the immediate termination of the flight. All lost link procedure must be contained within the approved COA airspace and remain below 1000' AGL.

12. LOST COMMUNICATIONS. In the event that two-way communications are lost or become unavailable, the operator will execute "go-to rally" and autoland or "end flight" within the approved COA airspace, below 1000' AGL. Notify Oceana NAS Approach Control Facility Air Ops Officer on Duty at (757) 433-2162/2163 and advise them of possible lost communications and coordinate a backup means of communication. (Note: Use of telephones as a primary means of two-way communication is at the sole discretion of Oceana NAS Approach Control Facility)

13.

14. MISCELLANEOUS.

- A. The United States Special Operations Command and/or its representatives are responsible at all times for collision avoidance with non-participating aircraft and the safety of persons or property on the surface with respect to the UAS.
- B. Incident / Accident Reporting: The following information is required to document unusual occurrences associated with UAS activities in the National Air Space System.
 - 1. The proponent for the COA shall provide the following information to Donald.E.Grampp@faa.gov on a monthly/annual basis (Note: reporting is not

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required until the first flight occurs. Then reporting must continue on a monthly/annual basis even when no flights are executed):

- Number of flights conducted under this COA.
 - Pilot duty time per flight.
 - Unusual equipment malfunctions (hardware/software).
 - Deviations from ATC instructions.
 - Operational/coordination issues.
 - All periods of Loss of Communications.
2. The following shall be submitted to Donald.E.Grampp@faa.gov within 24 hours:
- Deviations from the “Special Provisions” contained in the COA.
 - All periods of Loss Link, including duration.
 - All incidents involving the UAS as defined in 49 CFR 830.
 - All accidents involving the UAS as defined in 49 CFR 830.