

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

CERTIFICATE OF WAIVER OR AUTHORIZATION

ISSUED TO Department of the Navy	
ADDRESS: PMA266 22707 Cedar Point Road, Bldg 3261 Patuxent River, MD 20670	
This certificate is issued for the operations specifically described hereinafter. No person shall conduct any operation pursuant to the authority of this certificate except in accordance with the standard and special provisions contained in this certificate, and such other requirements of the Federal Aviation Regulations not specifically waived by this certificate.	
OPERATIONS AUTHORIZED Operation of the Fire Scout Unmanned Aircraft System (UAS) in Class D, E and G airspace under the jurisdiction of Trent Lott ATCT and Mobile ATCT/TRACON. Operations that depart the Class D will transition to/from W-453 as depicted in attachment 2. All operations will conform to the provisions contained in the LOA (attachment 1) and the provisions listed within this authorization. See special provisions.	
LIST OF WAIVED REGULATIONS BY SECTION AND TITLE	
STANDARD PROVISIONS	
<ol style="list-style-type: none"> 1. A copy of the application made for this certificate shall be attached and become a part hereof. 2. This certificate shall be presented for inspection upon the request of any authorized representative of the Federal Aviation Administration, or of any State or municipal official charged with the duty of enforcing local laws or regulations. 3. The holder of this certificate shall be responsible for the strict observance of the terms and provisions contained herein. 4. This certificate is nontransferable. 	
Note-This certificate constitutes a waiver of those Federal rules or regulations specifically referred to above. It does not constitute a waiver of any State law or local ordinance.	
SPECIAL PROVISIONS	
Special Provisions are set forth and attached.	
This certificate (2009-ESA-43) is effective from November 19, 2010 through November 18, 2011 and is subject to cancellation at any time upon notice by the Administrator or his/her authorized representative.	
BY DIRECTION OF THE ADMINISTRATOR	
	
<u>FAA Headquarters, AJV-13</u> <small>(Region)</small>	<u>Ardyth Williams</u> <small>(Signature)</small>
<u>November 18, 2010</u> <small>(Date)</small>	<u>Air Traffic Manager, Unmanned Aircraft Systems</u> <small>(Title)</small>

ATTACHMENT to FAA FORM 7711-1

Issued To: Department of the Navy

Address: PMA266
22707 Cedar Point Road, Bldg 3261
Patuxent River, MD 20670

Activity: Operation of the Fire Scout Unmanned Aircraft System (UAS) in Class D, E and G airspace under the jurisdiction of Trent Lott ATCT and Mobile ATCT/TRACON. Operations that depart the Class D will transition to/from W-453 as depicted in attachment 2. All operations will conform to the provisions contained in the LOA (attachment 1) and the provisions listed within this authorization.

Purpose: To prescribe UAS operating requirements (outside of restricted and/or warning area airspace) in the National Airspace System (NAS) for the purpose of training and/or operational flights.

Dates of Use: This Certificate of Authorization (COA) 2009-ESA-43 is valid from November 19, 2010 through November 18, 2011. Should a renewal become necessary, the proponent shall advise the Federal Aviation Administration (FAA), in writing, no later than 60 days prior to the requested effective date.

General Provisions:

- The review of this activity is based on our current understanding of UAS operations, and the impact of such operations in the NAS, and therefore should not be considered a precedent for future operations. As changes occur in the UAS industry, or in our understanding of it, there may be changes to the limitations and conditions for similar operations.
- All personnel connected with the UAS operation must comply with the contents of this authorization and its provisions.
- This COA will be reviewed and amended as necessary to conform to changing UAS policy and guidance.

Safety Provisions:

Unmanned Aircraft (UA) have no on-board pilot to perform see-and-avoid responsibilities, and therefore, when operating outside of restricted areas, special provisions must be made to ensure an equivalent level of safety exists for operations had a pilot been on board. In accordance with 14 CFR Part 91, *General Operating and Flight Rules*, Subpart J-Waivers, 91.903, *Policy and Procedures*, the following provisions provide acceptable mitigation of 14 CFR Part 91.113 and must be complied with:

- For the purpose of see-and-avoid, visual observers must be utilized at all times except in Class A airspace, restricted areas, and warning areas. The observers may either be ground based or in a chase plane. The UA must remain within a lateral distance of no more than **one (1) nautical mile laterally and 3,000 feet vertically** from the visual observer. The distances listed are the maximum distance; at no time will the UA be operated at a distance beyond the visual line of sight for the visual observer.
- UAS pilots will ensure there is a safe operating distance between manned and unmanned aircraft at all times in accordance with 14 CFR Part 91.111, *Operating Near Other Aircraft*, and 14 CFR Part 91.113, *Right-of-Way Rules*. Cloud clearances and VFR visibilities for Class E airspace will be used regardless of class of airspace. Additionally, UAS operations are advised to operate well clear of all known manned aircraft operations.
- The dropping or spraying of aircraft stores, or carrying of hazardous materials (included ordnance) outside of active Restricted, Prohibited, or Warning Areas is prohibited unless specifically authorized in the Special Provisions of this COA.

Airworthiness Certification Provisions:

- UA must be shown to be airworthy to conduct flight operations in the NAS.
- Public Use Aircraft must contain one of the following:
 - A civil airworthiness certification from the FAA, or
 - A statement specifying that the Department of Defense Handbook “Airworthiness Certification Criteria” (MIL-HDBK-516), as amended, was used to certify the aircraft or
 - Equivalent method of certification.

Pilot / Observer Provisions:

- **Pilot Qualifications:** UA pilots interacting with Air Traffic Control (ATC) shall have sufficient expertise to perform that task readily. Pilots must have an understanding of and comply with Federal Aviation Regulations and Military Regulations applicable to the airspace where the UA will operate. Pilots must have in their possession a current second class (or higher) airman medical certificate that has been issued under 14 CFR Part 67, *Medical Standards and Certification*, or a military equivalent. 14 CFR Part 91.17, *Alcohol or Drugs*, applies to UA pilots.
- Aircraft and Operations Requirements:
 - Flight Below 18,000 Feet Mean Sea Level (MSL).
 - UA operations below 18,000 feet MSL in any airspace generally accessible to aircraft flying in accordance with visual flight rules (VFR) require visual observers, either airborne or ground-based. Use of ATC radar alone does not constitute sufficient collision risk mitigation in airspace where uncooperative airborne operations may be conducted.
 - Flights At or Above 18,000 Feet Mean Sea Level (MSL)

- When operating on an instrument ATC clearance, the UA pilot-in-command must ensure the following:
 1. An ATC clearance has been filed, obtained and followed.
 2. Positional information shall be provided in reference to established NAS fixes, NAVAIDS, and waypoints. Use of Latitude/Longitude is not authorized.

- **Observer Qualifications:** Observers must have been provided with sufficient training to communicate clearly to the pilot any turning instructions required to stay clear of conflicting traffic. Observers will receive training on rules and responsibilities described in 14 CFR Part 91.111, *Operating Near Other Aircraft*, 14 CFR Part 91.113, *Right-of-Way Rules*, cloud clearance, in-flight visibility, and the pilot controller glossary including standard ATC phraseology and communication. Observers must have in their possession a current second class (or higher) airman medical certificate that has been issued under 14 CFR Part 67, *Medical Standards and Certification*, or a military equivalent. 14 CFR Part 91.17, *Alcohol or Drugs*, applies to UA observers.

- **Pilot-in-Command (PIC) –**
 - **Visual Flight Rules (VFR) as applicable:**
 - The PIC is the person directly responsible for the operation of the UA. The responsibility and authority of the pilot in command as described by 14 CFR Part 91.3 (or military equivalent), applies to the UAS PIC.
 - The PIC operating a UA in line of sight must pass at a minimum the required knowledge test for a private pilot certificate, or military equivalent, as stated in 14 CFR Part 61.105, and must keep their aeronautical knowledge up to date.
 - There is no intent to suggest that there is any requirement for the UAS PIC to be qualified as a crewmember of a manned aircraft.
 - Pilots flying a UA on other than instrument flight plans beyond line of sight of the PIC must possess a minimum of a current private pilot certificate, or military equivalent in the category and class, as stated in 14 CFR Part 61.105.
 - **Instrument Flight Rules (IFR) as applicable:**
 - The PIC is the person directly responsible for the operation of the UA. The responsibility and authority of the pilot in command as described by 14 CFR Part 91.3 (or military equivalent), applies to the UAS PIC.
 - The PIC must be a certified pilot (minimum of private pilot) of manned aircraft (FAA or military equivalent) in category and class of aircraft flown.
 - The PIC must also have a current/appropriate instrument rating (manned aircraft, FAA or military equivalent) for the category and class of aircraft flown.

- **Pilot Proficiency – VFR/IFR as applicable:**
 - Pilots will not act as a VFR/ IFR PIC unless they have had three qualified proficiency events within the preceding 90 days.
 - The term “qualified proficiency event” is a UAS-specific term necessary due to the diversity of UAS types and control systems.

- A qualified proficiency event is an event requiring the pilot to exercise the training and skills unique to the UAS in which proficiency is maintained.
- Pilots will not act as an IFR PIC unless they have had six instrument qualifying events in the preceding six calendar months (an event that requires the PIC to exercise instrument flight skills unique to the UAS).
- **PIC Responsibilities:**
 - Pilots are responsible for a thorough preflight inspection of the UAS. Flight operations will not be undertaken unless the UAS is airworthy. The airworthiness provisions of 14 CFR Part 91.7, *Civil Aircraft Airworthiness*, or the military equivalent, apply.
 - One PIC must be designated at all times and is responsible for the safety of the UA and persons and property along the UA flight path.
 - The UAS pilot will be held accountable for controlling their aircraft to the same standards as the pilot of a manned aircraft. The provisions of 14 CFR Part 91.13, *Careless and Reckless Operation*, apply to UAS pilots.
- **Pilot/Observer Task Limitations:**
 - Pilots and observers must not perform crew duties for more than one UA at a time.
 - Chase aircraft pilots must not concurrently perform either observer or UA pilot duties along with chase pilot duties.
 - Pilots are not allowed to perform concurrent duties both as pilot and observer.
 - Observers are not allowed to perform concurrent duties both as pilot and observer.

Standard Provisions: These provisions are applicable to all operations unless indicated otherwise in the Special Provisions section.

- The UA PIC will maintain direct two-way communications with ATC and have the ability to maneuver the UA per their instructions. The PIC shall comply with all ATC instructions and/or clearances.
- If equipped, the UA shall operate with an operational mode 3/A transponder, with altitude encoding, or mode S transponder (preferred) set to an ATC assigned squawk.
- If equipped, the UA shall operate with position/navigation lights on at all times during flight.
- The UA PIC shall not accept any ATC clearance requiring the use of visual separation or sequencing.
- VFR cloud clearances and visibilities for Class E airspace will be used regardless of class of airspace the UAS is operating in, except when operating in Class A airspace where 14 CFR Part 91.155 will apply.
- Special VFR is not authorized.
- Operations (including lost link procedures) shall not be conducted over populated areas, heavily trafficked roads, or an open-air assembly of people.

- Operations outside of restricted areas, warning areas, prohibited areas (designated for aviation use) and/or Class A airspace may only be conducted during daylight hours.
- Operations shall not loiter on Victor airways, Jet Routes, Q Routes, T Routes, IR Routes, or VR Routes. When necessary, transit of airways and routes shall be conducted as expeditiously as possible.
- Operations conducted under VFR rules shall operate at appropriate VFR altitudes for direction of flight (14 CFR Part 91.159).
- The UA PIC or chase plane PIC (whichever is applicable) will notify ATC of any in flight emergency or aircraft accident as soon as practical.
- All operators that use GPS as a sole source must check all NOTAMs and Receiver Autonomous Integrity Monitoring (RAIM). Flight into GPS test area or degraded RAIM is prohibited.
- At no time will TCAS be used in any mode while operating an unmanned aircraft.
- Only one UA will be flown in the operating area.
- A copy of this COA will be maintained on site by the PIC or designated representative.
- The Department of the Navy, and/or its representatives, is 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.

Special Provisions:

1. In the event of a lost link, the UAS pilot will immediately notify ATC or the controlling agency for the airspace within which the UAS is currently operating, state pilot intentions, and comply with the following provisions:
 - If the UA loses link while within any portion of W-453, the UA will remain within the warning area and attempt to re-establish link. If link cannot be re-established within the preset lost-link timer setting (usually less than three minutes), the UAS will proceed on the lost link route to land at Singing River Island. The chase aircraft will remain with the UAS throughout the flight from takeoff to landing.
 - If the UA loses link while on any portion of the outbound/inbound route (outside the warning area and class D), the UA will fly the preprogrammed route until the lost-link timer setting expires (less than 3 minutes). Pre-coordinated mission plans will ensure the most advantageous lost-link route to enter and will depend upon distance to destination. If the UA is returning to PQL and is “feet dry,” then the UA pilot will proceed direct along the flight-planned route to PQL.
 - If the UA is on Route 2A and is diverting to Singing River Island, then the UA pilot will fly to Waypoint 14 located at latitude 30°20’08.04”N, longitude 88°35’41.71”W. If the UA is on Route 2B and is diverting to Singing River Island, then the UA pilot will fly to Waypoint 9 located at latitude 30°17’27.65”N, longitude 88°28’48.52”W. In both scenarios, the UA pilot will then fly to the lost link waypoint to land at Singer River Island. In either scenario, the UA will be chased to landing.

- The UA lost link mission will not transit or orbit over populated areas.
 - When outside of restricted/warning area airspace, lost link programmed procedures will avoid unexpected turn-around and/or altitude changes and will provide sufficient time to communicate and coordinate with ATC.
 - Lost link orbit points shall not coincide with the centerline of Victor airways.
2. Operations will only be conducted during the hours of sunrise to sunset and when the Trent Lott Air Traffic Control Tower (ATCT) is operational.
 3. When possible, UA operations should be conducted south of airway V-240 and beneath the minimum en route altitude of 2,000' MSL for airway V-198.
 4. The proponent will provide information, by circular or other suitable means, for posting with fixed base operators, at the six local heliports, and at other appropriate locations to inform the local pilot community of ongoing unmanned aircraft operations at Trent Lott International.
 5. A maximum of one UA will be controlled at a time for each ground control station.

NOTAM: A distance (D) Notice to Airmen shall be issued when UA operations are being conducted. This requirement may be accomplished through your local base operations or NOTAM issuing authority. You may also complete this requirement by contacting Flight Service Station at 1-877-4-US-NTMS (1-877-487-6867) not more than 72 hours in advance, but not less than 48 hours prior to the operation and provide:

- Name and Address of pilot filing NOTAM request
- Location, Altitude or the operating Area
- Time and nature of the activity

NOTE FOR PROPONENTS FILING THEIR NOTAM WITH DoD ONLY: This requirement to file with the AFSS is in addition to any local procedures/requirements for filing through DINS. The FAA Unmanned Aircraft Systems Office is working with the AFSS, and to eliminate the requirement to file a NOTAM with both the AFSS and DINS in the near future.

Incident / Accident and Normal Reporting Provisions: The following information is required to document routine and unusual occurrences associated with UAS activities in the NAS.

- The proponent for the COA shall provide the following information to Donald.E.Grampp@faa.gov on a monthly basis:
 - 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 link (telemetry, command and/or control)
- The following shall be submitted via COA Online, email or phone (202-385-4542, cell (b) (6)) to Donald.E.Grampp@faa.gov **within 24 hours and prior to any additional flight under this COA:**
 - All accidents or incidents involving UAS activities, including lost link.
 - Deviations from any provision contained in the COA.

This COA does not, in itself, waive any Federal Aviation Regulation (FAR) nor any state law or local ordinance. Should the proposed operation conflict with any state law or local ordinance, or require permission of local authorities or property owners, it is the responsibility of the Department of the Navy to resolve the matter. This COA does not authorize flight within Special Use Airspace without approval from the Using Agency. The Department of the Navy is hereby authorized to operate the Fire Scout Unmanned Aircraft System in the operations area depicted in "Activity" above and attachment 2 below.

Attachments

1. Letter of Agreement – U.S. Navy and Trent Lott ATCT
2. Operations Area

DEPARTMENT OF THE NAVY, PROGRAM EXECUTIVE OFFICE STRIKE
WEAPONS AND UNMANNED AVIATION, PROGRAM MANAGER FOR NAVY
AND MARINE CORPS MULTI-MISSION TACTICAL UNMANNED AIR
SYSTEMS (PMA 266),
TRENT LOTT INTERNATIONAL AIRPORT ATC FACILITY, AND
NORTHROP GRUMMAN AEROSPACE SYSTEMS, STRIKE AND
SURVEILLANCE SYSTEM DIVISION (NGAS SSSD)
LETTER OF AGREEMENT
(LOA)

EFFECTIVE: 20 September 2010

SUBJECT: COORDINATION AND CONTROL PROCEDURES

1. **PURPOSE:** This Letter of Agreement (LOA) establishes procedures for the control of air traffic between the MQ-8B, Fire Scout, Vertical Takeoff and Landing Unmanned Aerial Vehicle (VTUAV) Program and Trent Lott International Airport Air Traffic Control Facility (PQL). This LOA is supplemental-to and does not supersede the FAAH 7110.65 and FAAH 7210.3, nor does this LOA supersede conditions or procedures stipulated elsewhere in the approved Certificate of Authorization.
2. **SCOPE:** This LOA outlines the procedures to be used in control of air traffic and the MQ-8B, Fire Scout, Unmanned Aircraft System (UAS) operating within PQL Class D airspace and as otherwise described herein.
3. **RESPONSIBILITIES:** The United States Navy, Program Manager for Navy and Marine Corps Multi Mission Tactical Unmanned Air Systems, (PMA 266), his designated agents, and PQL are responsible for ensuring compliance with the procedures set forth in this agreement.
4. **GENERAL PROCEDURES:** Deviation from any procedures contained herein is authorized for immediate safety considerations and in other instances where prior coordination is accomplished which clearly defines responsibility and accountability. All altitudes are in MSL unless otherwise indicated.
 - a. NGAS SSSD will ensure that all MQ-8B air vehicle operators (AVOs) undergo thorough training on local course rules, radio communications procedures, separation standards, and airspace procedures prior to conducting flight operations at PQL.
 - b. All MQ-8B operations will have a primary control station. If an unplanned interruption of communication between the control station and

the MQ-8B occurs, the AVO-in-command shall immediately notify the appropriate controlling agency.

c. All MQ-8B operations at PQL shall be under control of the PQL Control Tower (PQL Tower). The airfield consists of a single 6500' runway 17/35 with a parallel taxiway. Unless otherwise arranged in advance, PQL taxiway "Bravo" will serve as the primary launch and recovery point for MQ-8B operations. The launch pad at the Northrop Grunman facility will serve as the secondary MQ-8B launch and recovery point.

d. The PQL Class D airspace is activated during the published hours of operation as contained in the Airport/Facility Directory or per NOTAM. The Class D airspace is depicted on the current New Orleans VFR Sectional. It is defined as that airspace extending upward from the surface up to and including 2,500 feet MSL within a 4.1 statute mile radius of PQL airport.

e. Local flights shall remain within the boundaries of PQL Class D airspace. Local flights will be conducted within the parameters set forth in this LOA.

f. Warning Area flights are defined as those authorized flights originating/terminating within PQL Class D airspace, but conducted primarily within Warning Area (W-453). Warning Area flights will be conducted within the parameters specified in agreement with the Naval Air Station Pensacola Fleet Area Control Surveillance Facility (FACSFAC) call sign SEABREEZE and Houston Air Route Traffic Control Center (ARTCC).

g. During Fire Scout flight operations when piloted aircraft are in the airport traffic pattern, the MQ-8B should remain east of the parallel taxiway and the piloted aircraft should remain west of the Runway 17/35 centerline. These traffic patterns are directed and coordinated by PQL Tower. Pattern altitudes for piloted fixed wing/rotary-wing aircraft will be at 1000 ft. and 500 ft. respectively. The normal MQ-8B downwind pattern is east of the parallel taxiway at 500 ft. or requested altitude for MQ-8B Warning Area Flight departures and arrivals.

h. PQL Tower will grant approval for all MQ-8B flights departing and entering the PQL Class D airspace. PQL tower will provide initial advisories to Mobile Approach Control for MQ-8B aircraft departing the Class D airspace to W-453 and any known arriving MQ-8B inbound to PQL from W-453.

5. **DEPARTURE PROCEDURES:** Prior to departure, the AVO-in-command shall obtain approval to proceed from PQL Tower on (b) (3) (Local Control Frequency). The AVO will notify PQL Tower with a proposed schedule with estimated departure times of MQ-8B flights as soon as practicable but no later than one hour prior to moving the MQ-8B to the launch location (taxiway Bravo) on the day of operation. Any substantial changes (up to 30 minutes) to the proposed schedule or estimated departure times will be coordinated with PQL Tower. PQL Tower may temporarily withhold MQ-8B departure authorization for traffic de-confliction.
6. **ARRIVAL PROCEDURES:** The AVO-in-command will notify PQL Tower with proposed arrival of MQ-8B as it exits W-453, and shall request permission from PQL Tower to enter PQL Class D airspace. PQL Tower may temporarily withhold approval for MQ-8B to enter PQL Class D airspace for traffic de-confliction. The AVO-in-command shall obtain landing clearance for the MQ-8B from PQL Tower.
7. **PQL TOWER CLOSED OPERATIONS:** Because Air Traffic Control services are not provided when the tower is closed, the MQ-8B will not operate during periods when the PQL Tower is closed.
8. **EMERGENCY PROCEDURES:** The AVO-in-command shall be responsible for the handling of all actual emergency procedures. PQL Tower will assist when requested by the AVO-in-command.
 - a. **Loss of Link:** When commanding data uplinks between the controlling station and the MQ-8B are lost, the AVO-in-command will immediately advise PQL Tower of the situation. PQL Tower will actively manage air traffic to ensure the anticipated MQ-8B flight path is clear of all traffic.
 - b. **Flight Control Malfunctions:** Any MQ-8B experiencing flight control malfunctions will be recovered as soon as possible. If recovery to the runway at PQL is not possible, then all efforts will be made to fly the MQ-8B to an uninhabited area to minimize the hazard to persons and property on the ground.
 - c. **Loss of Communications (NORDO):** Should primary communications be lost, between the AVO-in-command and PQL Tower, NGAS SSSD will attempt telephone contact with PQL Tower to coordinate MQ-8B recovery.
9. **WEATHER MINIMUMS:** The following weather criteria shall be adhered to when conducting MQ-8B flight operations under VFR only while arriving and departing PQL Class D airspace.

10. **MISHAP REPORTING:** Mishap investigation and reporting for incidents involving MQ-8B will be the responsibility of PMA 266. PQL Tower shall be notified immediately of any accident/incident, involving any MQ-8B operating to/from PQL.

APPROVED BY:

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Tactical Unmanned Systems, NGAS SSSD

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Unmanned Air Systems (PMA 266)

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