

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

CERTIFICATE OF WAIVER OR AUTHORIZATION

ISSUED TO

Department of the Navy

ADDRESS

USN PEO Strike Weapons and Unmanned Aviation
RADM William A. Moffett Building
47123 Buse Road, Bldg 2272
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 UAS in Class D and E airspace under the jurisdiction of Trent Lott ATCT and Mobile ATCT (Attachment 1). Operations that depart the Class D will transition to/from W-453 as depicted below (See Attachment 2). See Special Provisions.

LIST OF WAIVED REGULATIONS BY SECTION AND TITLE

STANDARD PROVISIONS

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.

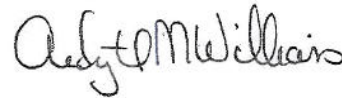
Note-This certificate constitutes a waiver of those Federal rules or regulations specifically referred to above. It does not constitute a waiver of any State law or local ordinance.

SPECIAL PROVISIONS

Special Provisions are set forth and attached.

This certificate 2007-AHQ-43 is effective from August 1, 2008, through July 31, 2009, and is subject to cancellation at any time upon notice by the Administrator or his/her authorized representative.

BY DIRECTION OF THE ADMINISTRATOR



FAA Headquarters, AJR-36
(Region)

Ardyth Williams
(Signature)

April 18, 2008
(Date)

Air Traffic Manager, Unmanned Aircraft Systems
(Title)

ATTACHMENT to FAA FORM 7711-1**ISSUED TO:** Department of the Navy**ADDRESS:** USN PEO Strike Weapons and Unmanned Aviation
RADM William A. Moffett Building
47123 Buse Road, Bldg 2272
Patuxent River, MD 20670**NAME:** Federal Aviation Administration (FAA) Certificate of Authorization (COA) for Fire Scout Unmanned Aircraft Systems (UAS) in the National Airspace System (NAS) outside of restricted/warning area airspace.**ACTIVITY:** Operation of the Fire Scout UAS in Class D and E airspace under the jurisdiction of Trent Lott Airport Traffic Control Tower (ATCT) and Mobile ATCT (Attachment 1). Operations that depart the Class D will transition to/from W-453 as depicted below (See Attachment 2). All operations will conform to the provisions of the attached LOA and the endorsement letter from the U.S. Navy (See attachment 1).**PURPOSE:** To prescribe operating requirements in the NAS (outside of restricted and/or warning area airspace) for the purpose of training and/or operational flights.**DATES OF USE:** This COA (2007-AHQ-43) is valid from August 1, 2008, through July 31, 2009. Should a renewal become necessary, the proponent shall advise the 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 the 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 special 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/warning/Class A airspace 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:

- Visual Observers, either ground-based or airborne, must be used.
- The applicant and/or its representatives are responsible for collision avoidance with all aircraft, other aviation operations, and the safety of persons or property on the surface.

AIRWORTHINESS CERTIFICATION PROVISIONS:

- UA must be shown to be airworthy to conduct flight operations in the NAS.
- Public Use Aircraft applications 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 UAS will operate. Pilots must have in their possession a current third class (or higher) airman medical certificate that has been issued under 14 CFR 67, Medical Standards and Certification, or a military equivalent. 14 CFR 91.17, Alcohol or Drugs, applies to UA pilots.
- **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 91.111, *Operating Near Other Aircraft*, and 14 CFR 91.113, *Right-of-Way Rules*. Observers must have in their possession a current third class (or higher) airman medical certificate that has been issued under 14 CFR 67, Medical Standards and Certification, or a military equivalent. 14 CFR 91.17, Alcohol or Drugs, applies to UA observers.
- **Pilot-in-Command (PIC) – Visual Flight Rules (VFR):**
 - 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 91.3 (or military equivalent), applies to the UAS PIC.
 - The PIC must pass the required knowledge test for a private pilot certificate, or military equivalent, as stated in 14 CFR 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.

Pilot Proficiency – VFR:

- Pilots will not act as a 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 flying UA on other than instrument flight plans must pass the required knowledge test for a private pilot certificate, or military equivalent, as stated in 14 CFR 61.105.

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 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 91.13, *Careless and Reckless Operation*, apply to UAS pilots.

Pilot/ATC Instructions: The PIC will maintain direct two-way communications with ATC and have the ability to maneuver the UA per their instructions as applicable.

SPECIAL PROVISIONS:

The FAA recognizes that, by nature, UAS have no on-board pilot to perform see-and-avoid responsibilities. Therefore, when operating outside of restricted airspace, special provisions must be made to ensure an equivalent level of safety exists for operations had a pilot been on board. Listed below are the special provisions that must be complied with. All personnel connected with this UAS operation shall comply with the contents of this authorization and its special provisions.

1. All UAS operations shall be conducted under Visual Flight Rules (VFR) in Visual Meteorological Conditions (VMC) in accordance with CFR 14 Part 91.
2. For the purpose of see-and-avoid, visual observers must be utilized at all times when operating outside of restricted, prohibited or warning area airspace. The visual observers may be either ground based or in a chase aircraft and must remain within 1 mile laterally and/or 3,000 feet vertically of the UAS during all operations. Pilot/observers must not operate the Fire Scout at a distance beyond that at which see-and-avoid responsibilities can be exercised.

3. Operations will only be conducted during the hours of sunrise to sunset and when the Trent Lott Air Traffic Control Tower (ATCT) is operational.
4. Operations outside of restricted airspace may only be conducted during daylight hours.
5. The UAS transponder and position/navigation/anti-collision strobe lights shall be activated at all times during flight, if equipped.
6. Lost link procedures (IAW the LOA and chart at Attachment 1):
 - a) In the event of a loss of control link, the UAS pilot will immediately advise ATC or the controlling agency for the airspace that the UAS is currently operating in, as well as the chase aircraft.
 - b) If the UA loses link while within any portion of W-453, the UA will remain within the warning area airspace 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.)
 - c) 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 diverting to Singing River Island, then the UA pilot will fly to the enroute waypoint at (b) (3) if on Route ^{(b) (3)} or to the enroute waypoint at (b) (3) if on Route ^{(b) (3)} and proceed to the lost link waypoint to land at Singing River Island. In either case, the UA will be chased to landing.
6. Operations, including lost link, shall not be operated over populated areas, heavily trafficked roads, or an open-air assembly of people.
7. Special VFR operations are not authorized.
8. When possible the 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.
9. 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.

NOTAM: A distance (D) Notice to Airman shall be issued when UA operations are being conducted. Contact the Automated Flight Service Station at 1-800-WX-BRIEF (992-7433) not more than 72 hours in advance, but not less than 48 hours prior to the operation and provide:

- Name and Address of the Using Facility
- Location, Altitude or the operating Area
- Time and nature of the activity

NOTE: 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 REPORTING: The following information is required to document unusual occurrences associated with UAS activities in the NAS.

- The proponent for the COA shall provide the following information to (b) (6) on a monthly/annual 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 Communications.
- The following shall be submitted to (b) (6) 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.

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 UAS in the operations area depicted in "Activity" above and Attachment 2 below.

**NORTHROP GRUMMAN INTEGRATED SYSTEMS, WESTERN REGION AND
TRENT LOTT INTERNATIONAL AIRPORT ATC FACILITY
LETTER OF AGREEMENT
(LOA)**

EFFECTIVE: 1 September 2007

SUBJECT: COORDINATION AND CONTROL PROCEDURES

1. **PURPOSE:** This Letter of Agreement (LOA) establishes procedures for the control of air traffic between Northrop Grumman Integrated Systems, Western Region (NGISWR) and Trent Lott International Airport Air Traffic Control Facility (PQL). This LOA is supplemental to the FAAH 7110.65 and FAAH 7210.3.
2. **SCOPE:** This LOA outlines the procedures to be used in control of air traffic and NG Fire Scout MQ-8B (MQ-8B) operating within PQL Class D airspace and as otherwise described herein.
3. **RESPONSIBILITIES:** NGISWR 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. NGISWR is responsible for ensuring 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, NGISWR shall, immediately notify the appropriate controlling agency.
 - c. All MQ-8B operations at PQL shall be under positive 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

Grumman 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. Clearance shall be issued by PQL Tower for MQ-8B flights departing and entering the PQL Class D airspace. PQL tower will provide initial advisories to Mobile Approach Control for MQ-8B 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 NGISWR AVO shall obtain clearance from PQL Tower on (b) (3) (Local Control Frequency). NGISWR 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 clearance or traffic de-confliction.

6. **ARRIVAL PROCEDURES:** NGISWR will notify PQL Tower with proposed arrival of MQ-8B as it exits W-453. NGISWR shall request permission from PQL Tower for clearance 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. NGISWR 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, NGISWR will not operate the MQ-8B during periods when the PQL Tower is closed.
8. **EMERGENCY PROCEDURES:** NGISWR shall be responsible for the handling of all actual emergency procedures. PQL Tower will assist when requested by NGISWR.
 - a. **Loss of Link:** When commanding data uplinks between the controlling station and the MQ-8B are lost, NGISWR 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 by NGISWR as soon as practicable. If attempted recovery poses a hazard to persons or property at PQL, the MQ-8B will, to the extent possible, be flown to the nearest suitable emergency landing site, preferably an uninhabited area.
 - c. **Loss of Communications (NORDO):** Should primary communications be lost, between NGISWR and PQL Tower NGISWR 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 the NGISWR. PQL Tower shall be notified immediately of any accident/incident, involving any MQ-8B operating to/from PQL.

APPROVED BY:

(b) (6)

(b) (6)



DEPARTMENT OF THE NAVY
PROGRAM EXECUTIVE OFFICER
UNMANNED AVIATION AND STRIKE WEAPONS
RADM WILLIAM A MOFFETT BUILDING
47123 BUSE ROAD BLDG 2272
PATUXENT RIVER, MD 20670-1547

11130
Ser PMA-266/08-031
27 March 2008

- From: Program Manager, Navy and Marine Corps Multi Mission Tactical Unmanned Air Systems (PMA 266)
- To: CDR Stephen Hartung, Federal Aviation Administration, Southern Region Navy Representative (ASO-930)
- Subj: Endorsement of Letter of Agreement (LOA) for coordination and control procedures between Northrop Grumman Integrated Systems, Western Region (NGISWR) and Trent Lott International Airport Air Traffic Control Facilities
- Ref: (a) Letter of Agreement (LOA) for coordination and control procedures between Northrop Grumman Integrated Systems, Western Region (NGISWR) and Trent Lott International Airport Air Traffic Control Facilities
1. The Navy has reviewed and concurs with the procedures identified in reference (a), in support of MQ-8B flight operations at Trent Lott International Airport.
 2. For further coordination, PMA-266 point of contact is (b) (6)

(b) (3)
CAPT USN

(b) (3)

Route (b) (3) Waypoints

(b) (3)