

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, Maryland 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 Global Hawk UAS in Class D airspace at (b) (3) over-water Class A airspace under the jurisdiction of Seattle Air Route Traffic Control Center (ARTCC), Oakland ARTCC, Los Angeles ARTCC bounded on the north by the Vancouver FIR boundary; east to the western shoreline of the U.S. south to the U.S./Mexican ADIZ, west to the Oakland Center Oceanic CTA/FIR; north to the point of beginning. Operation of the Global Hawk in Class A Oceanic airspace to/from the Oakland Center CTA/FIR west to and within the Hawaiian Coastal ADIZ under the jurisdiction of the Honolulu Control Facility (HCF). 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 2008-WSA-8 is effective from June 2, 2008, through June 1, 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)

(Signature)

May 27, 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, Maryland 20670

NAME: Federal Aviation Administration (FAA) Certificate of Authorization (COA) for Global Hawk Unmanned Aircraft Systems (UAS) in the National Airspace System (NAS) outside of restricted/warning area airspace.

ACTIVITY: Operation of the Global Hawk UAS in Class D airspace at (b) (3) ; over-water Class A airspace under the jurisdiction of Seattle Air Route Traffic Control Center (ARTCC), Oakland ARTCC, Los Angeles ARTCC bounded on the north by the Vancouver FIR boundary; east to the western shoreline of the U.S. south to the U.S./Mexican ADIZ, west to the Oakland Center Oceanic CTA/FIR; north to the point of beginning. Operation of the Global Hawk in Class A Oceanic airspace to/from the Oakland Center CTA/FIR west to and within the Hawaiian Coastal ADIZ under the jurisdiction of the Honolulu Control Facility (HCF). 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 (2008-WSA-8) is valid from June 2, 2008, through June 1, 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-in-Command (PIC) – Instrument Flight Rules (IFR):**
 - 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 be a certified pilot of manned aircraft (FAA or military equivalent) in category and class of aircraft flown.
 - The PIC must also have an appropriate instrument rating (manned aircraft, FAA or military equivalent) for the category and class of aircraft flown.

Pilot Proficiency – VFR/IFR:

- 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).
- 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, except Oceanic flight – then the PIC will use ARINC (see procedures in Special

Provisions) to relay all position and other reporting requirements and have the ability to maneuver the UA per their instructions as applicable.

SPECIAL PROVISIONS:

The FAA recognizes that, by nature, UAS have no pilot on-board the aircraft to perform see-and-avoid responsibilities. Therefore, when operating outside of Restricted or Warning Area 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.

Overview

1. Unless otherwise coordinated, all flights shall be conducted on an IFR flight plan when operating outside of an active Warning or Restricted Area.
2. (b) (3) shall be appropriately scheduled and activated for all flights to preclude mandating a chase plane.
3. Unless an emergency exists, all departures shall use runway 21, all arrivals shall use runway 03 at (b) (3)
4. Unless otherwise coordinated, all flights will operate at an altitude no lower than FL510 and no higher than FL 600, except for takeoff and landing.
5. (b) (3) shall discuss mission schedules with the USAF Global Hawk (GH) Operating Units to preclude more than one GH aircraft, including lost link procedures, from operating simultaneously in the same ATC facility sector's airspace.
6. (b) (3) shall provide the Western Service Center, Operations Support Group with current emergency divert locations and approach procedures for dissemination to affected field facilities.
7. (b) (3) shall send mission schedules and coordinate airspace requirements no later than (3) days prior to flight with all affected facilities:
 - a. (b) (3), (b) (6)
 - b. Plead Military Radar Unit: (b) (6) , FAX (805) 989-1869
 - c. SOCAL TRACON OM: (b) (6)
 - d. FACSFAC San Diego: (b) (6)
FAX: (619) 545-4711
 - e. Los Angeles Center MOS: 9-awp-zla-mos@faa.gov
 - f. Oakland Center MOS: 9-awp-zoa-mos@faa.gov
 - g. Seattle Center MOS: 9-anm-zseat-mos@faa.gov

h. Honolulu Control Facility (HCF) (Oceanic only): (b) (6)
 , fax: (808) 840-6110

i. FACSFAC Pearl Harbor (Oceanic only): (b) (6)
 (808) 472-7317

FAX:

8. All Global Hawk flights shall be MARSAs with all other participating aircraft while in active Warning or Restricted Areas.

(b) (3) :

Flight plans (Call sign: (b) (3) , type aircraft: RQ4)

1. File all domestic flight plans, no later than two (2) hours, no more than twenty-three (23) hours prior to flight using Fix, Radial and Distance (FRD). The initial approach fix (b) (3)) shall be included in the return route of flight.
2. File all oceanic flight plans, no later than two (2) hours, no more than twenty-three (23) hours prior to flight using latitude and longitude to and from the domestic control boundary while in the confines of the oceanic control boundary. Include the length of delay in Honolulu Control Facility airspace in the flight plan.
3. Include a Fix Radial Distance (FRD) of the center point of holding when flight plan includes a delay en route. Do not duplicate the FRD when returning to the flight plan route.
4. Flight plan all flights north of (b) (3) , at or above FL 530 while in Seattle Center's airspace.
5. For flights within Oakland Center Oceanic airspace where en route delays are anticipated, pilots shall include the anticipated delay points as route elements defined as latitude/longitude or waypoint names. At least one hour prior to the delay point, the pilot must coordinate with the sector controller. Coordination shall include latitude/longitude or waypoint name where delay will take place, requested delay radius around that point and estimated time when the aircraft will proceed to the next en route position. The pilot will keep the controller informed of progress and update estimates whenever they change by 3 minutes or more from the previously coordinated time. If there is a need to change the point at which the aircraft will delay and that point is not a route element, the pilot shall advise the sector controller as soon as possible so that a revised route clearance can be issued.
6. Pilots shall not request a delay with the sector controller that would place the aircraft closer than 50 nm to the Oakland Oceanic and Honolulu Control Facility boundary. Should a delay in this location be necessary, (b) (3) shall pre-coordinate a stationary ALTRV through the Central Altitude Reservation Facility (CARF) no

later than 7 days prior to flight. Aircraft participation in the ALTRV shall be the first element of the flight plan remarks section. CARF: (703) 904-4426.

Departures

1. Unless otherwise cleared by ATC, depart via the Global Hawk departure procedure in Attachment (2) to cross 10 DME southwest of (b) (3) at or below 8000' MSL, cross 25 DME southwest of (b) (3) at or below 12,000' MSL, then climb as instructed by Plead (b) (3) and remain within the confines of W-289 until receiving pre-filed IFR ATC clearance from Los Angeles Center.
2. Unless otherwise cleared by ATC, climb to flight plan altitude will be accomplished while in the lateral and vertical confines of (b) (3) before proceeding on course.

Arrivals

1. Unless otherwise cleared by ATC, descent from flight plan altitude to approach altitude will be accomplished within the lateral and vertical confines of (b) (3) .
2. Unless otherwise cleared by ATC, arrive via the Global Hawk approach procedure in Attachment (3) to cross 25 DME southwest of (b) (3) at or below 12,000' MSL, cross 10 DME southwest of (b) (3) at or below 8000' MSL, then via the approach. The initial approach fix is located at the (b) (3) .

Missed Approach

1. In the event of a missed approach, pilot will advise ATC and execute the Global Hawk missed approach procedure in Attachment (4). The missed approach procedure is defined as: "climbing right turn to 2500' MSL within the confines of the (b) (3) Class D airspace to the (b) (3) , then climb to cross 10 DME southwest of (b) (3) NTD at or below 8000' MSL, climb to cross 25 DME southwest of (b) (3) at or below 12,000' MSL, climb and maintain FL190 direct to the (b) (3) , hold (right turns) and advise."

Special Oceanic/Pacific/Honolulu Requirements:

1. When operating west of the Oceanic Control Boundary (OCB), route of flight elements shall be listed as latitude/longitude points or published waypoint names. Route of flight elements must be no more than eighty (80) minutes flight time apart.
2. Primary communications when operating west of the OCB shall be with San Francisco Aeronautical Radio, Inc. (ARINC). San Francisco ARINC telephone number is (925) 294-8400. At least one hour prior to departure, the pilot must contact San Francisco ARINC to establish appropriate telephone contact procedures for that flight.

3. Once established within the lateral confines of Honolulu Control Facility (HCF), Fix/Radial/Distance elements can be used to define route of flight. Enter the length of delay in HCF airspace in the flight plan and specify the fix within HCF airspace that the aircraft will depart from to return to CONUS.

ATC Frequency assignments: primary/secondary

1. Pt. Mugu Tower: 290.375/340.2
2. Pt. Mugu Departure Control: 307.275/128.65
3. Pt. Mugu Approach Control: 307.275/128.65
4. Plead Military Radar Unit (MRU): 306.6/127.55
5. Los Angeles Center: 369.9 or 338.3/132.15
6. FACSFAC (Beaver): W291 - 266.9/120.85, sec 289.9/118.65; W283 - 285 - 328.45/124.125; W260 - 513 290.15/120.825
7. Oakland Center: Northbound: Sector 14 – 290.5/134.55; Sector 35 – 387.1/134.15; Sector 36 – 306.2/119.97
8. Seattle Center: Northbound: Sector 15 – 360.7/135.15; Sector 42 – 257.65/132.07; Sector 2 – 269.0/128.3; Sector 3 - 319.2/125.1
9. Honolulu Control Facility: 127.6/126.6

Lost Link/Lost Communications

1. Loss of Command Link (C1). Aircraft will squawk ^(b) (3). Pilot will contact ATC via landline numbers listed below and coordinate action of the **pre-programmed contingency route. Contingency routes cannot be changed by the pilot or ATC.**

Pre-programmed contingency routes

- a. Pt. Mugu Approach Airspace. Lost link timer will be set at 10 minutes. Aircraft shall continue on flight plan until lost link timer times out then the aircraft will return to NTD via established approach procedure listed in Attachment (3). The aircraft will comply with all crossing restrictions listed in the arrival, departure and missed approach sections of this COA.

- b. All other airspace. Lost link timer will be set at 5 minutes. Aircraft will squawk (b) (3). Pilot will contact ATC via landline to confirm the contingency routing to return to base. **Aircraft will remain at flight plan altitude until within the confines of (b) (3)** . If link is reestablished, pilot will advise ATC of intentions.
- i. (b) (3) : The aircraft will turn to the center of (b) (3) then descend via the approach procedure for arrival.
 - ii. (b) (3) : On the northern leg, the aircraft will continue paralleling the northern boundary of (b) (3) until making a left turn towards (b) (3) . Upon reaching (b) (3) , aircraft will descend via approach procedure for arrival.
 - iii. (b) (3) : On southern, eastern and western legs the aircraft will turn to the center of (b) (3) and proceed along the center of (b) (3) until making a left turn towards (b) (3) . Upon reaching (b) (3) , aircraft will descend via approach procedure for arrival.
 - iv. All other airspace: The aircraft will turn southeast to join the primary flight plan route, parallel the U.S. coastline to (b) (3) . Upon reaching (b) (3) , aircraft will descend via approach procedure for arrival.
 - v. Hawaiian/Oceanic: The aircraft will reverse course and fly via the primary flight plan route back to (b) (3) . Upon reaching (b) (3) , aircraft will descend via approach procedure for arrival.
2. Lost Communications between Pilot and ATC: Aircraft will squawk (b) (3), comply with FAR 91, contact ATC via landline numbers listed below and coordinate action.

Loss of Subsystem or Aborted Takeoff/Landing

1. Loss of sub-system redundancy (C2). Aircraft will squawk normal. Pilot will assess situation and, if necessary, request alternate ATC clearance to return to base.
2. Aborted Take-off/Refusal to Land (Go-Around) (C4): Aircraft will squawk normal. Pilot will advise ATC of intentions. Go-around: Pilot will advise ATC and execute the Global Hawk missed approach procedures in Attachment (4).

Emergency Procedures:

1. Emergency: loss of a critical system, engine and/or electrical failure (C3). Aircraft will squawk (b) (3). Pilot will declare emergency and advise ATC of divert location, route to initial approach fix/location and intentions.

Lost Link/Emergency/Lost Communications Facility Landline Numbers:

1. (b) (3), (b) (6)
2. (b) (3), (b) (6)
3. (b) (3), (b) (6)
4. Los Angeles Center: (661) 265-8205 / (661) 265-8231
5. (b) (3), (b) (6)
6. Oakland Center: (510) 745-3342 / (510) 745-3218/3219
7. Seattle Center: (253) 351-3523 / (253) 351-3520
8. Honolulu Control Facility: (808) 840-6201 / (808) 840-6221
9. San Francisco ARINC: (925) 294-8400

Landline Communications to Global Hawk Pilot:

1. Launch and Recovery Element (LRE) **arrival/departure** (b) (3), (b) (6)
2. Mission Control Element (MCE) **en route**: (b) (3), (b) (6)
3. Navy Global Hawk Operations Center Pax River
 - a. During flight operations (b) (3), (b) (6)
 - b. During non-flight operations (b) (3), (b) (6)

NOTAM: A distance (D) Notice to Airman shall be issued when UA operations are being conducted in NTD Class D airspace. Contact the Automated Flight Service Station 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

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 Global Hawk UAS in the operations area depicted in “Activity” above.

Attachments:

1. West Coast Operations Area
2. Departure Procedure
3. Arrival Procedure
4. Missed Approach Procedure

(b) (3)

(b) (3)