

CERTIFICATE OF WAIVER OR AUTHORIZATION

ISSUED TO

United States Air Force, Air Combat Command (ACC)

ADDRESS

HQ ACC/A3AA
205 Dodd Blvd. Suite 101
Langley AFB, VA 23665

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, E and A airspace

LIST OF WAIVED REGULATIONS BY SECTION AND TITLE

N/A

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, 2009-WSA-77, is effective from February 25, 2011 through January 24, 2012, 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, AJV-13

(Region)

Ardyth Williams

(Signature)

23 February 2011

(Date)

Air Traffic Manager, Unmanned Aircraft Systems

(Title)

ATTACHMENT to FAA FORM 7711-1

ISSUED TO: United States Air Force, Air Combat Command (ACC)

ADDRESS: HQ ACC/A3AA
205 Dodd Blvd. Suite 101
Langley AFB, VA 23665

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

ACTIVITY: Operation of the USAF Global Hawk UAS in Class D, E, and A airspace under the jurisdiction of Andersen Air Force Base Airport Traffic Control Tower (ATCT) and Guam Air Route Traffic Control Center (ARTCC-ZUA).

PURPOSE: To prescribe operating requirements in the NAS (outside of restricted and/or warning area airspace) for operational missions.

DATES OF USE: This COA (2009-WSA-77) is valid from February 25, 2011 through February 24, 2012. Should a renewal become necessary, the proponent shall advise the FAA, in writing, no later than 60 business 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 must maintain visual contact with the UA at all times while scanning the immediate environment for potentially conflicting traffic. At no time will the visual observer permit the unmanned aircraft to operate beyond line-of-sight. Additionally,

visual observers must be positioned within three nautical miles laterally and 3000 feet vertically to exercise see-and-avoid responsibilities required by Title 14 of the Code of Federal Regulations part 91.113, Right-of-Way Rules: Except Water Operations. A dedicated visual observer must monitor all UA departure and arrival/recovery operations.

- Visual Observers, either ground-based or airborne, must be used. This includes Class D airspace areas. Visual observers are not required inside the following portion of airspace designated as a Defense Area in accordance with Title 14 of the Code of Federal Regulations, part 99.7, Special Security Instructions (14 CFR 99.7)*:
 1. above the ceiling of the Andersen Class D, and
 2. below the base of Class A airspace

**For the purpose of this COA, airspace designated as such will be referred to as “99.7 SSI”.*

- Sterile cockpit procedures must be observed during critical phases of flight.
- 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. The holder of this COA (or delegated representative) is responsible for halting or canceling activity in the approved flight area if at any time the safety of persons or property on the ground or in the air is in jeopardy or if there is a failure to comply with terms or conditions of this COA.

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 second 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 second 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.

All crewmembers including the PIC and visual observers must receive training under the direct supervision of a qualified instructor.

- **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 UAS 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.
- The PIC must maintain instrument currency and takeoff and landing currency for both day and night.

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. A pilot in command (PIC) must be at the controls of the UA during all phases of flight.
- The PIC must conduct a pre-takeoff briefing which includes a briefing on the contents of the COA, the maximum altitude to be flown, initial heading, frequencies to be used, lost link procedures, the parameters for the use of a ditch point, hazards unique to the flight being flown, emergency landing procedures on takeoff and landing, the amount of fuel flight time remaining including a reserve on the UA, and any other briefing requirements.
- 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.

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, unless specified otherwise in the Special Provisions section. 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 must operate both navigation and strobe lights for all

nighttime operations outside of restricted airspace. Nighttime operations are prohibited if the navigation and/or strobe lights are inoperable.

- The UA PIC shall not accept any ATC clearance requiring the use of visual separation or sequencing.
- 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, unless authorized in the Special Provisions section.
- Operations conducted under VFR rules shall operate at appropriate VFR altitudes for direction of flight (14 CFR 91.159).
- Operators that use GPS as a sole source must check all NOTAM's and Receiver Autonomous Integrity Monitoring (RAIM). Flight into GPS test area or degraded RAIM is prohibited without specific approval in the special provisions.
- 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.
- A complete copy of the COA must be at all sites whenever UA operations are being conducted. The PIC and the visual observer must read the COA, including the special provisions.
- The USAF, 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. For the purposes of this COA, all Guam Global Hawk operations will be contained in the Global Hawk Operations Area within ZUA airspace. The operations area is within the airspace defined as a 250nm radius with the center point – (ARSR4) of 13°32'08"N 144°54'51"E. (COA Attachment 1)
2. The USAF shall enter into a Letter Agreement (LOA) with all affected ATC facilities for operations into and out of specific airports outside of restricted areas. The Letter of Agreement shall address operational and ATC requirements unique and specific to each location and/or airport. The LOA (included as separate attachment) that has been agreed to for Guam operations refers to the following points for GH operations:
 - a. UA Zone – UA Zone is located with a center point at UNZ315060 with a 40 nm radius of that point. The (Nimitz) UNZ315060 coordinates are 14°11'17.17"N 144°01'52.57"E. (COA Attachment 2)
 - b. The (Anderson) UAM317008 coordinates are 13°41'32.18"N 144°51'24.21"E.
 - c. The UAM 317008 is also known as "GECKO" in the LOA.

NOTE: GECKO will not be filed or used in GH Flight plans as it is a fix in HCF airspace HNL 241022.

3. Global Hawk Procedures are covered in the Guam ARTCC, Andersen ATCT and ACC DET 3 EFFECTIVE: 1 SEP 10 LOA; Subject: Inter-Facility Coordination Procedures, see LOA paragraph 10 GLOBAL HAWK (RQ-4) PROCEDURES and LOA Attachment 3: RQ-4 Global Hawk Preplanned Routing.
4. Terminal operations below Class A airspace require either airborne or ground based visual observers. In lieu of visual observers, a 99.7 SSI may be requested and utilized for operational missions below Class A airspace. For all operations in Class D airspace, visual observers are required.
5. A 99.7 SSI is not authorized for training.
6. For all UAS operations, the airport surveillance radar must be fully operable and functioning and Andersen ATCT must be open.
7. **Lost Link (C1)** procedures:
 - a. Aircraft will squawk 7600 and follow pre-programmed route of flight.
 - b. Advise ZUA with programmed route of flight and altitude schedule. Call ZUA at 671-473-1210.
 - c. The RQ-4 Lost Link (C1) routing is dependent on position and will follow procedures outlined in LOA. (Special Provision #3 above)
 - d. Advise ZUA when link is re-established.
8. **Return to Base Contingency (C2)**
 - a. A RTB contingency will be to Andersen AFB. Upon receiving notification of any RTB category system malfunction, the PIC will immediately initiate coordination directly with ATC
9. **Emergency Procedures – engine or electrical System Loss contingency (C3)**
 - a. Emergency: loss of critical system, engine and/or electrical generating system failure. Aircraft will squawk 7700. The PIC will declare an emergency and advise ATC of divert location, route of flight to initial approach fix/location and intentions.
 - b. If the aircraft is within 125 NM of an approved authorized divert airport, the pilot will execute a prearranged approach and landing. The pilot will report to ATC when aircraft has landed.
 - c. If the aircraft is beyond 125 NM of an approved authorized divert airport, the aircraft will descend on the cleared route, or on a course assigned by ATC until impacting the surface. The pilot will immediately report to ATC when aircraft has impacted the surface and indicate the time and location.
 - d. With a total loss of propulsion or full electrical generating system failure, essential flight control systems will be powered by the battery. The battery provides a maximum of 45 minutes of electrical power, allowing the aircraft to glide for approximately 125 NM as it descends from cruise altitude to the surface.

10. Emergency Landing – other than engine failure, unable to RTB
 - a. An emergency will be declared when a critical system failure is occurring or has occurred, engine is still operating, and aircraft is not capable of returning to Andersen AFB. Aircraft will squawk 7700. The pilot will declare an emergency and advise ATC of divert location, route of flight to initial approach fix/location and intentions
 - a. If able to fly to an approved divert airport, the aircraft will fly the approved approach for landing at the divert airport. The approach will be manually selected by the pilot and will have been previously coordinated with all effected facilities and the divert airport.
 - b. The aircraft will descend on the cleared route, or on a course assigned by ATC until landing.
 - b. If unable to return to Andersen or an approved divert airport, aircraft will be ditched. The aircraft will descend on the cleared route, or on a course assigned by ATC until impacting the surface.
11. **Landing Abort Procedures (C4)**
 - a. A landing can be aborted by either the pilot or the aircraft. If a go around is commanded by the pilot or the aircraft then the aircraft executes a preplanned missed approach.
12. Operations outside of restricted airspace or warning areas may only be conducted only on an IFR flight plan. Operations in Class E (above Class A) at night are authorized.
13. Restricted/ Warning Areas/ ATCAA's :
 - a. Mission planning and/or filing into or through an SUA or ATCAA indicates to ATC that prior permission has been obtained from the using agency. Protected airspace is that airspace within 3 NM of SUA or ATCAA (6 NM at or above FL600). This minima is based on ATC altitude clearance, regardless of the aircraft's actual altitude.
 - b. Advance mission coordination shall indicate to ZUA specific SUA areas that will be affected by the mission and if prior permission has been obtained from the using agency. Absent this information, ATC will vector the aircraft away from the SUA to maintain required ATC separation standards.
 - c. ATC will not obtain permission for transit or delays in SUA for GH missions.
14. The USAF is responsible to de-conflict mission parameters with GPS Jamming/Testing activities.
15. The USAF is responsible to coordinate with other military organizations for flight above FL600. ATC does not determine mission priority or de-conflict competing missions; only standard ATC separation services will be provided.
16. The USAF is responsible and must coordinate with other military operating units to preclude more than one Global Hawk UAS, including lost link procedures, from operating simultaneously in the same ATC facilities airspace.

17. The USAF must coordinate and send mission schedules and coordinate airspace requirements prior to flight with all affected facilities for that flight. This coordination will be completed NLT one business day before flight:
 - a. ZUA -One business day prior: Email - Tim.Cornelison@faa.gov and Terry.Pyle@faa.gov
 - b. Include current pilot contact information and also include Launch and Recovery Element (LRE) and Mission Control Element (MCE) phone numbers.
 - c. Email will include:
 - a. ZUA GLOBAL HAWK CHECK LIST
 - b. ppt of route of flight and
 - c. Nav flight plan.
18. Global Hawk flight plan will be submitted and transmitted as an ICAO IFR flight plan a minimum of 2 hours prior to flight.
19. A frequency integrity check must be conducted prior to the launch of the UA.
20. Global Hawk pilot will advise ATC during flight when aircraft/ pilot control transfers from LRE to MCE and from MCE to LRE.
21. Night operations are authorized. The ground observer(s) must be in place thirty minutes prior to night operations to ensure dark adaptation.
22. The use of cell phones or other telephonic communication must not be used unless required (due to primary radio failure) for the operational control of the UA and any required communications with Air Traffic Control. In the event of primary radio failure, the mission must be terminated as soon as safely feasible.
23. The United States Air Force has made its own determination on the Airworthiness and safety on the Global Hawk UA. The Global Hawk UA must be operated in strict compliance with all provisions, conditions, and warnings contained in the Airworthiness Certificate issued by the Department of Defense, United States Air Force (including all Appendices) and must comply with any provisions, conditions and warnings issued by the manufacturer.

NOTAM requirement: A distance (D) Notice to Airmen shall be issued when UA operations are being conducted below Class A or for operations not contained in a 99.7 SSI. A NOTAM is not required for operations inside of SUA. 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.

Data reporting provisions: The following information is required to document operations associated with UAS activities. The reported information is required for all operations covered under a COA regardless of the type of airspace flown to include activities within Special Use Airspace (SUA). The proponent for the COA shall submit the following information via COA On-Line on a monthly basis using the On-Line forms:

- Number of flights conducted under this COA. (A flight during which any portion is conducted in the NAS shall be counted only once, regardless of how many times it may enter and leave special use airspace between takeoff and landing.)
- Aircraft operational hours per flight
- GCS operational hours in support of each flight, to include LRE Ops
- Pilot duty time per flight
- Equipment malfunctions (hardware/software) affecting either the aircraft or the ground control station.
- Deviations from ATC instructions and/or Letters of Agreement/Procedures
- Operational/coordination issues
- Number and duration of lost link events (control, vehicle performance and health monitoring, or communications) per aircraft per flight

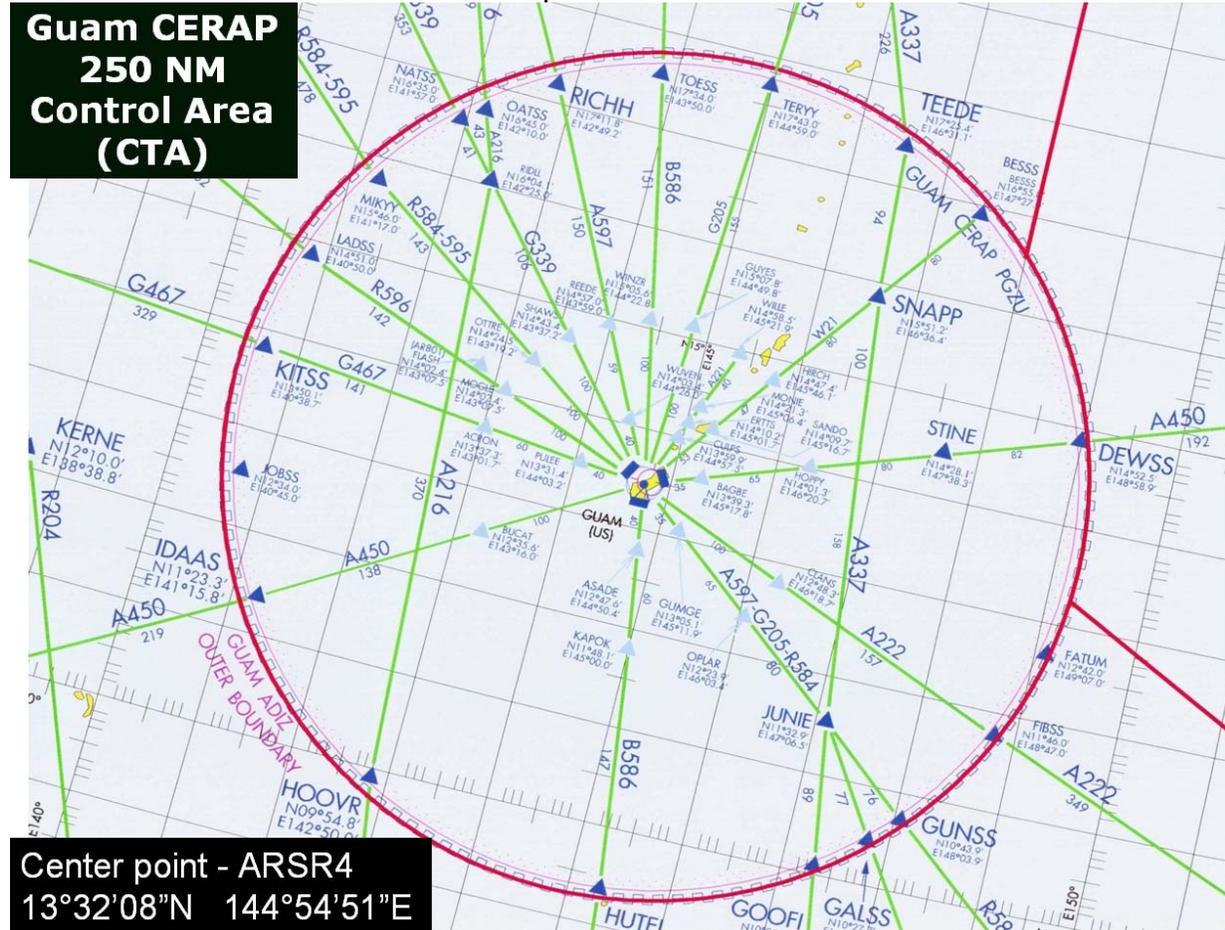
Incident / Accident Reporting: The following information is required to document unusual occurrences associated with UAS activities in the NAS.

The following shall be submitted via email, COA online or phone (202-385-4542, cell 443-569-1732) to Donald.E.Grampp@faa.gov within 24 hours and before further flight:

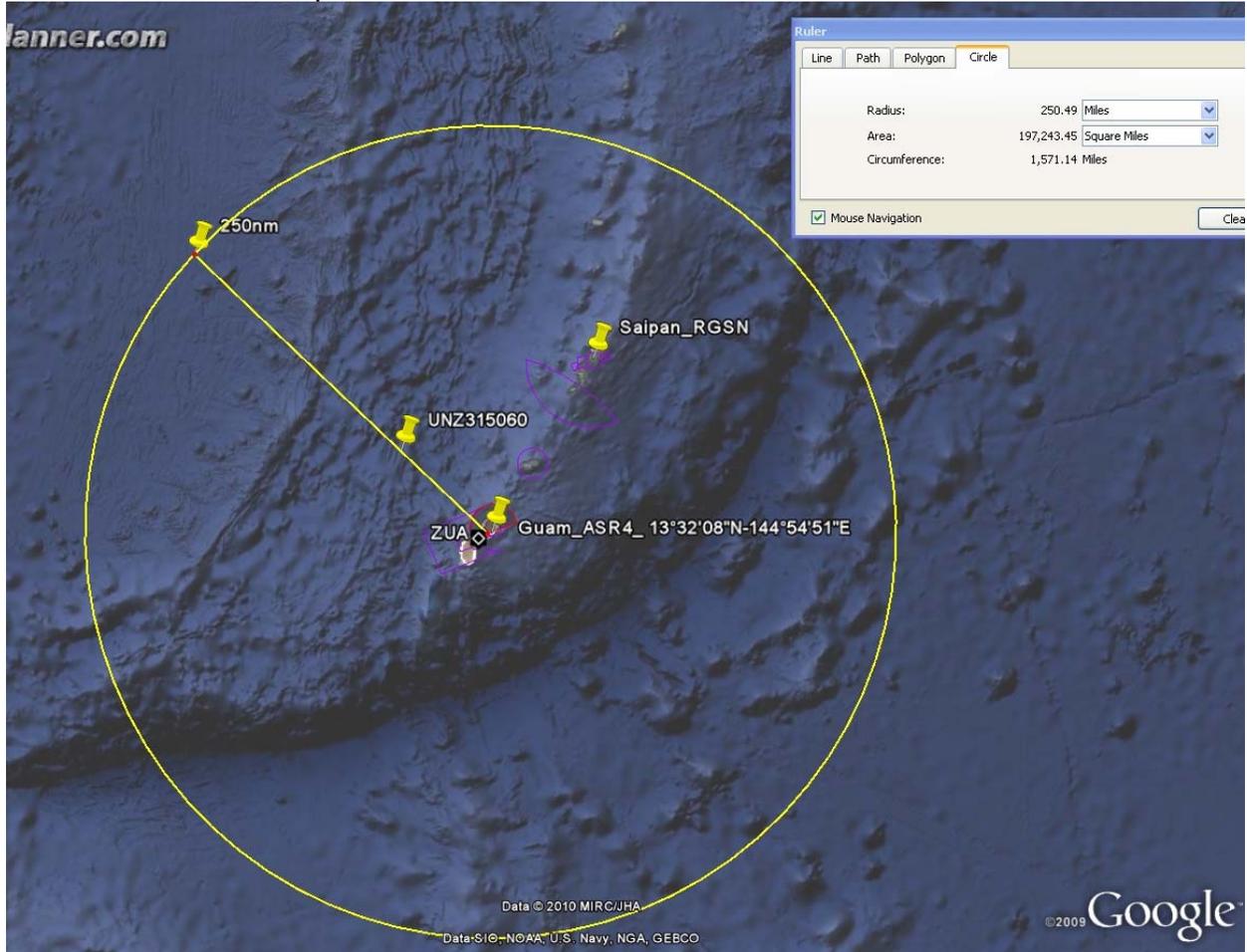
- a. All accidents or incidents involving the UAS as defined in 49 CFR 830
- b. All periods of Loss-of-Link, including duration.
- c. Deviations from the "Special Provisions" contained in the COA

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 USAF to resolve the matter. This COA does not authorize flight within Special Use Airspace without approval from the Using Agency. The USAF is hereby authorized to operate the Global Hawk UAS in the operations area depicted in the attachments to this document.

Attachment 1 – Guam Global Hawk Operations area



Attachment1 cont.
Guam Global Hawk Operations area _GOOGLE



Attachment 2 – Guam Global Hawk UA Zone and associated Defense Area.

