



DEPARTMENT OF THE AIR FORCE
HEADQUARTERS AIR FORCE SPECIAL OPERATIONS COMMAND

14 Dec 2009

MEMORANDUM FOR HQ AFSOC/A3OUI

FROM: A3OU

SUBJECT: Airworthiness Safety Release, Qualification Level 3, for Operation of the Puma AE Unmanned Aircraft System (UAS) at/or near Stennis Space Center Buffer Zone, MS.

1. Scope: This memorandum constitutes an Airworthiness Safety Release (ASR), Qualification Level 3, authorizing operation of the Puma AE UAS for operations at/or near Stennis Space Center Buffer Zone, MS. This ASR is intended to support the issuance of a Certificate of Waiver or Authorization (COA) from the Federal Aviation Administration (FAA).
2. Validity: This ASR is valid for the period of performance of the approved COA and subsequent renewals. This ASR is terminated upon changes in configuration of the subject equipment beyond authorized payload changes, or upon issuance of a later Airworthiness Safety Release, whichever occurs first. This ASR is valid only for operations specified within the approved Federal Aviation Administration (FAA) Certificate of Waiver or Authorization (COA) area, in accordance with (IAW) Reference D-1, at/or near Stennis Space Center Buffer Zone, MS.

3. List of Appendices:

Appendix A – Restrictions and Operating Information
Appendix B – Configuration and Installation Detail
Appendix C – Inspections, Maintenance, and Logbook Instructions
Appendix D – References List

4. Point of contacts (POC) are (b) (6), (b) (3) 10 USC 130b

(b) (6), (b) (3) 10 USC 130b

(b) (6), (b) (3) 10 USC 130b

(b) (6), (b) (3) 10 USC 130b

USAF

(b) Unmanned Systems Branch

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Appendix A - Restrictions and Operating Information

WARNING

The air vehicle is susceptible to radiated emissions. Loss of link, loss of GPS, loss of video, and possible loss of vehicle control are likely in proximity to emitters. Operators shall avoid known high intensity Electromagnetic Interference (EMI) areas.

WARNING

Accidental operation of the Puma AE UAS outside of approved airspace shall be immediately reported to Air Traffic Control (ATC). The operator shall make immediate actions to correct the flight path and/or follow ATC direction.

WARNING

The Puma AE UAS does not have a sense and avoid system. Mid-air collision is a risk. All flight operations shall be conducted to ensure that manned and unmanned aircraft shall maintain proper separation. Airspace deconfliction shall be accomplished using local ATC procedures and procedures identified in the FAA COA.

WARNING

The Puma AE UAS has not completed full airworthiness qualification. All flight operations shall be conducted in a manner to minimize exposure to manned aircraft and populated ground areas.

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WARNING

The Puma AE UAS has not undergone SOF Explosive Atmosphere testing. A serious fire or explosion may result if the aircraft is powered while flammable vapors are present during ground or flight operations. Do not operate the system in the presence of flammable vapors.

WARNING

The operator must coordinate frequencies with any other UAS operators in the area in accordance with (IAW) the operator's manual and Local Spectrum Manager procedures. Failure to coordinate frequencies with other users could result in loss of vehicle control and possible loss of the air vehicle.

CAUTION

Noise characterization testing has not been completed on this system. Prolonged exposure to engine noise at close proximity may contribute to hearing loss. It is recommended that ear protection be worn while launching the UA.

1. Operate the Puma AE UAS IAW references D-2, except as modified by this ASR.
 - a. Flights shall be conducted by operators trained, qualified, and current in the operation of the Puma AE UAS. Operator training, qualification, and currency shall be documented.
 - b. Flights shall be conducted IAW local regulations, the provisions of the DoD/FAA MOA, Operation of DoD UAS in the National Airspace System, or as specified within an approved Federal Aviation Administration (FAA) Certificate of Waiver or Authorization (COA).
 - c. Flights shall avoid other Puma AE transmitters by at least 200 meters. Ground control stations shall be located at least 400 meters apart.
 - d. Flight over populated areas, buildings, or an open-air assembly of people shall be avoided.

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e. The observer's responsibility is to aid in visual airspace deconfliction. Both the observer and operator shall be instructed on proper procedures, responsibilities, and voice commands for visual airspace deconfliction

2. Functional checks of the Puma AE UAS and associated payload shall be accomplished IAW References D-2 before each flight. Launch of the UA with any known system failures, discrepancies, or degraded performance characteristics is prohibited.

a. Upon any failure during flight, vehicle operators must fly the UA back to the recovery location or utilize built in fail-safe features to recover the UA. Temporary loss of GPS satellites is not considered a failure condition.

3. If a systematic failure occurs, resulting in the departure of the UA from the flight areas defined in Appendix D-1, flight operations under this ASR are to be terminated. All test results, analyses, and safety assessments shall be documented, reviewed, and configuration managed as part of the aircraft and test configuration.

4. All site deconfliction activities (air and ground) shall be completed before flight (such as, but not limited to, frequency/channel usage, airspace management, air vehicle separation, FAA coordination, emergency responsibilities, etc).

5. Flight is restricted to day Visual Meteorological Conditions within the areas defined in Reference D-1 and the approved FAA COA. The UA must remain within clear visual range of the operator and/or ground observers at all times.

6. The observer's responsibility is to aid in visual airspace deconfliction. Both the observer and operator shall be instructed on proper procedures, responsibilities, and voice commands for visual airspace deconfliction.

7. Emergency procedures: The emergency procedures for the UAS are outlined in reference D-2 (operator's manual).

8. Summary Highlights:

a. The Puma AE UAS has not completed full airworthiness qualification. An ASR has been granted through a Level 3 airworthiness evaluation. A Level 3 ASR establishes a minimum level of safety for UAS operations. Strict adherence to the operator's manual, local Standard Operating Procedure for UAS, and this ASR is required to reduce risk loss of the aircraft, property damage and personal injury.

b. Coordination of channel selection with other systems operating in the area is critical to reducing accident rates.

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c. The ASR process review was limited to the specific system configuration listed in Appendix B. Engineering assessment has been conducted primarily to ensure safety of flight in the immediate environment of all personnel involved in the flight operations of the UAS. Major air vehicle or system modifications invalidate the ASR. For the purposes of this ASR, a major modification is defined as any configuration change/alteration to an item(s) that implements a capability change and/or expanded mission/usage or would result in a hazard associated with departure of the air vehicle from the flight boundaries defined in Appendix A.

d. The Puma AE UAS has been deemed to be expendable but reusable. The probability of loss of the air vehicle is accepted by the user's command. Any air vehicle loss experienced during flight operations conducted under this ASR must be reported to Higher Headquarters IAW paragraph 3-5 of USSOCOM DIRECTIVE 350-9 and the user's individual component's SOP; which can be found on the SUASMAN (<https://webapps.hurlburt.af.mil/suasmgr/default.aspx>) web application.

e. Range and airspace clearance is the responsibility of the operators. Compliance with airspace coordination and de-confliction requirements identified in the FAA COA supporting these flight operations is **MANDATORY**.

f. Procedures to establish a reasonable level of physical security for the flight operations areas prior to and during all flights must be developed and implemented during each flight to preclude inadvertent access to the area by non-authorized personnel.

g. Determination of the requirements for operator qualification, maintainer qualification, configuration management, established flight practices, and other associated procedures is beyond the scope of this ASR, but must be addressed by an appropriate authority to ensure an acceptable level of safety for the UAS and to minimize the risk to ground personnel and property.

h. Data collected as part of these flight operations should be made available to assist in the effort to address future airworthiness assessment of this UAS. This data includes, but is not limited to, dates of flights, flight durations, and any discrepancies noted during flights. It is the responsibility of the operator to record this data in the SUASMAN web application, which has been designated as the single point data repository for post flight data collection and incident reporting.

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Appendix B – Configuration and Installation Detail

1. Configuration details, other specific equipment, and drawings:

The Puma AE UAS is defined in references D-2.

2. Special installation instructions:

None

3. Installation verification and quality checks:

None

Appendix C – Inspections, Maintenance, and Logbook Instructions

1. Conduct inspections and maintenance as specified in references D-2.

Appendix D – References List

1. Puma AE Unmanned Aircraft System (UAS) Standard Operating Procedure (SOP) for Stennis Space Center Buffer Zone, MS, dated 11 June 2008.

2. Small Unmanned Aircraft System (SUAS) All-Environment Capable Variant (AECV) Puma All Environment (AE) Operator's Manual 50336_8s v. 8x, dated December 2008.

3. Puma AE Datasheet.