DEPARTMENT OF THE ARMY
U.S. Army Corps of Engineers
CECW-CE Washington, D.C. 20314-1000

Circular
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Expires 30 June 2018

Engineering and Design

ACQUISITION AND OPERATION OF UNMANNED AIRCRAFT SYSTEMS (UAS) TECHNOLOGY

1. Purpose. This circular provides guidance for the acquisition and operation of Unmanned Aircraft Systems (UAS) within the National Airspace System (NAS) and the current regulatory framework. UAS are to be used to support USACE authorized missions. Under no circumstances shall they be used to conduct surveillance on U.S. persons. This EC also provides guidance on the recreational and commercial operation of UAS over Corps owned/operated lands.

2. Applicability. This circular applies to all USACE elements planning to assign, bail, borrow, loan, lease, own, or otherwise authorize Unmanned Aircraft System (UAS) for operation. USACE elements are defined as HQUSACE, and all subordinate commands, districts, centers and field operating activities having Civil Works (CW) and Military Programs (MP) responsibilities. USACE elements also includes all parts of Engineer Research Development Center (ERDC). This EC applies to all UAS contract related activities, including direct acquisition of UAS services as well as UAS activities executed by prime or subcontractors supporting CW and MP missions.

3. Distribution. Approved for public release; distribution is unlimited.

4. References.

a. United States Code Title 10 Subtitle B-Army (§§ 3001 - 4842).

b. United States Code Title 49 § 40103.

c. Code of Federal Regulations (CFR), 14 CFR, Chapter I, Part 91.113 GENERAL OPERATING AND FLIGHT RULES, Right-of-way rules: Except water operations.

d. Army Regulation 70-62 Airworthiness Qualification of Aircraft Systems.

e. Army Regulation 95-20 Contractor's Flight and Ground Operations.

This circular supersedes EC 1110-1-106, dated 31 July 2015.

f. Army Regulation 95-23 Unmanned Aircraft System Flight Regulations.

g. Office of Management and Budget (OMB) Circular No. A-126, Improving the Management and Use of Government Aircraft.

h. Memorandum of Agreement Concerning the Operation of Department of Defense Unmanned Aircraft Systems in the National Airspace System 16 September 2013.

i. Memorandum, Assistant Secretary of the Army (ASA) Acquisition, Logistics, and Technology (ALT), 28 October 2011, Subject "Army Fixed Wing, Rotary Wing, and Non-Tethered Lighter than Air Platform Management Lead Responsibility."

j. Memorandum, ASA-ALT, August 2013, Subject "The Army's Procurement of Fixed Wing (FW) and Non-Tethered Lighter than Air Platform Aircraft."

k. Memorandum, Army Secretary, 13 January 2012, Subject "Army Directive 2012-02 (Supplemental Policy for Operations of Unmanned Aircraft Systems in the National Airspace System)."

l. Memorandum 15-002, Deputy Secretary of Defense, 17 February 2015, Subject "Guidance for the Domestic Use of Unmanned Aircraft Systems."

m. MIL-STD-882E Standard Practice for System Safety.

n. Army Field Manual 5-19 Composite Risk Management.

o. Code of Federal Regulations (CFR), 36 CFR, Chapter III, Part 327 – Rules and Regulations Governing Public Use of Corps of Engineers Water Resources Development Projects Administered by the Chief of Engineers.

p. USACE Operation Order 2014-32 (Integrated Protection) Annex R – Reports - Information and Intelligence Flow

q. Engineer Circular 1130-2-550, Chapter 9, USACE Recreation Use Fee Program

5. Overview. This document provides guidance for the acquisition and operation of UAS by USACE elements by summarizing the major policies and regulations that relate to the use of this new applied technology. This document also provides guidance for the private and commercial operation of UAS by the public on or above USACE water resources development projects. The adaptation of UAS as an applied technology may transform the way USACE meets its missions in a variety of ways; however, the use of this technology to meet existing and emerging mission requirements must be conducted in a deliberative and measured approach. An assessment of the balances between operational and financial risks against the desired benefits will be difficult to realize without an understanding of the existing rules and regulations governing USACE's use of this technology.

a. It is the policy of the Assistant Secretary of the Army for Acquisition, Logistics and Technology that all UAS acquisition, ownership, maintenance, and sustainment must be administered through Program Executive Office (PEO) Aviation (AVN). Furthermore, Army Regulation (AR) 70-62 requires that an Airworthiness Release (AWR) must be obtained to operate any Army aviation asset, inclusive of UAS. Finally, a USACE district is required to coordinate with the United States Army Aeronautical Services Agency (USAASA)" Department of Army Regional Representative to the FAA to operate a UAS within the NAS in compliance with standing policy, laws, and regulations. Figure 1 contains a schematic illustrating the different groups within the Army that a USACE district will interact with to acquire and operate a UAS.

b. For the purpose of this document an Unmanned Air Vehicle (UAV) is defined as a remotely piloted/operated, semi-autonomous, or autonomous air vehicle and its on-board operating system. This does not include air vehicles designed for one-time use as weapons (e.g., cruise missile). An Unmanned aircraft system (UAS) is comprised of individual elements consisting of the unmanned air vehicle (UAV), the control station, and any other support elements necessary to enable operation including, but not limited to data links, communications systems/links, and UAV-unique launch and recovery equipment. There may be multiple unmanned aircraft, control stations, and support elements within a UAS. The control station may be located on the ground (stationary or mobile), on a ship, submarine, aircraft, etc.

c. Key UAS coordination bodies and organizations relevant to USACE UAS operations are described below and in Figure 1. Sections 6 through 10 describe each Army group's role related to Small Unmanned Aerial Systems (SUAS) acquisition and operation.

(1) PEO AVN**.** PEO AVN is an aviation combat weapons platform developer/purchaser and system sustainer of systems for the Warfighter. Current Army policy directs procurement and sustainment must be managed in consultation with PEO AVN, to include the procurement and sustainment of UAS assets in support of Civil Works activities.

(2) Army Aviation Engineering Directorate (AED). AED is the Airworthiness Authority for Army UAS. This group makes Airworthiness determination for Army owned, operated, leased, bailed, etc. UAS. AED is a fee for service organization; consequently, funding is required to process AWR applications.

(3) United States Army Aeronautical Services Agency (USAASA) and the Department of Army Regional Representative (DAR). The DAR determines applicability of proposed UAS operations within the framework of the DoD-FAA MOA and interfaces with the FAA for access to unrestricted airspace. USAASA and the DAR are the mechanisms USACE shall use to coordinate with Army, DoD and FAA.

(4) Federal Aviation Administration (FAA)**.** FAA is the owner and regulatory authority over the NAS.

(5) USACE UAS Working Committee. The UAS Working Committee develops UAS policy, reviews UAS acquisition business cases and helps determine wither there are available UAS assets within USACE to meet mission requirements.

d. Reference 4.l. requires Secretary of Defense approval for all domestic UAS operations by DoD personnel. USACE has submitted a Proper Use Memorandum (PUM), and received approval from Secretary of Defense to fly UAS in support of Civil Works and Emergency Management Operations, as well as for research and development efforts. The PUM states that no U.S. person will be targeted, nor will any personally identifying information be collected. The Secretary of Defense approval is valid until March 2017. UAS training flights flown over Corps property inaccessible to the public that have the appropriate Army and FAA approvals do not require Secretary of Defense approval.

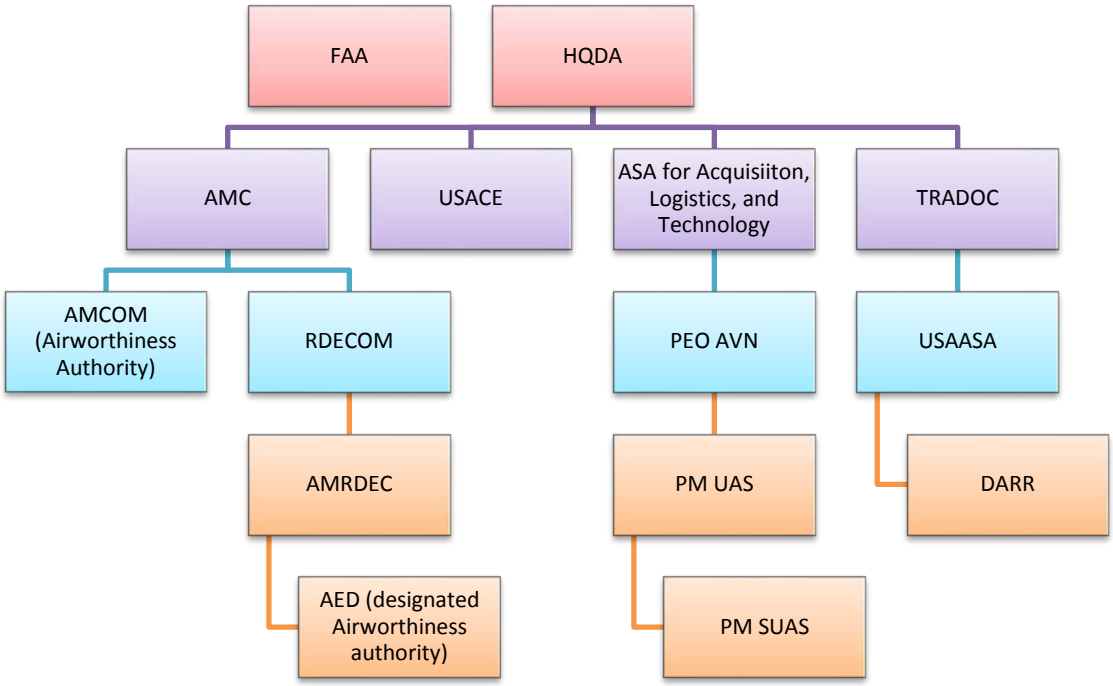

Figure 1. Army organizational structure relevant to UAS operations.

6. HQ USACE Requirements. Prior to purchasing a UAS, a Command must document a business case justifying the need for the equipment, and obtain written approval from the USACE UAS Working Committee. The business case shall include a cover letter, signed by the district Commander or lab director, and be submitted to the USACE UAS Working Committee for approval.

a. The business case prepared by the district shall address the following elements:

(1) Identify that private industry or existing resources cannot meet the requirement in a cost effective means as directed in OMB Circular A-126.

(2) Identify proposed mission(s) and technical need.

(3) Document annualized system cost over operational life. At a minimum include repair, replacement, maintenance, and initial Airworthiness Review costs.

(4) Information regarding the strategy to maintain, repair, and update the system as necessary.

(5) Include a system description with salient characteristics (dimensions, weight, speed, etc.)

(6) Identify how the operators will be trained to operate the system.

b. The USACE UAS Working Committee, chaired by HQ Engineering and Construction, will review the business case and work with the Command to determine whether there are available assets within USACE to meet the requirements. PEO AVN SUAS will participate in the USACE UAS Working Committee. The USACE UAS Working Committee will meet quarterly or as necessary. If USACE UAS Working Committee determines that existing UAS assets or contracts are not available to meet the technical requirements, the district can develop an acquisition strategy for a new UAS acquisition to meet the needs. Figure 2 contains an illustration of the process. USACE elements that have no experience with UAS technology shall only acquire UAS systems that have existing system AWR issued by AED. The USACE Working Committee will be comprised of the following participants:

(1) Engineering and Construction Division, Chair (CECW-CE)

(2) Logistics (CELD)

(3) PEO AVN SUAS

(4) Army Aviation Engineering Directorate (AED) Special Projects

(5) Emergency Management (CECO-HS)

(6) Jacksonville District UAS Section (CESAJ-OD-HU)

(7) USACE Photogrammetric Center of Expertise (CEMVS-EC-SD)

(8) Operations and Regulatory Division (CECW-CO)

c. Where a business case supports a contractor operated UAS and the Government has accepted some or all of the risks involved in the aircraft's operation via the process described in paragraph 7.b, follow the requirements of Army Regulation 95-20, Contractor's Flight and Ground Operations.

d. AR 700-138, Army Logistics Readiness and Sustainability, prescribes policy and provides procedures for collecting and reporting the physical condition of Army materiel. This regulation requires Commanders at all levels will determine the causes of equipment readiness deficiencies, take corrective action within their areas of responsibility, and provide feedback on systemic readiness problems to the next higher headquarters. To support this requirement the Directive of Logistics (DOL) HQ requires USACE Aviation Fleet Reporting, for all USACE aviation assets. USACE elements are required to report their aviation assets to USACE HQ DOL. The USACE

HQ DOL also has the following acquisition guidance for USACE elements that want to own, operate, or contract UAS to support their missions:

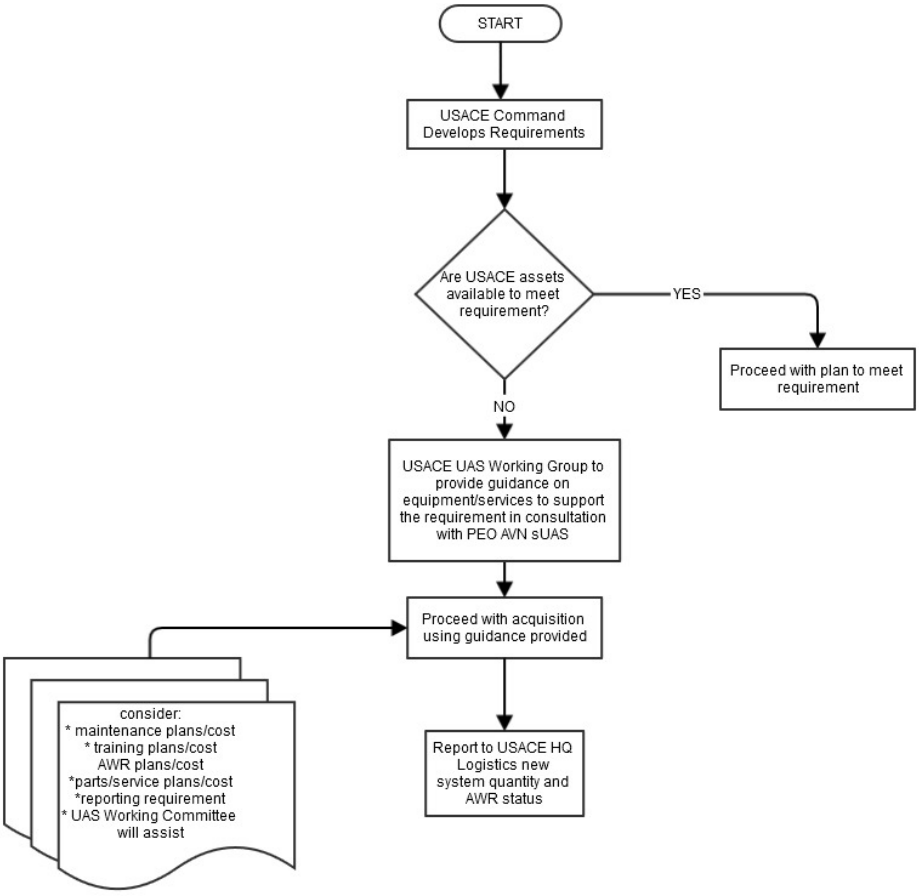

Figure 2. Summary of the business case flow chart for proposed UAS acquisition.

(1) Use established standard policies and procedures for defining requirements.

(2) Perform a survey of internal available resources to meet requirements (existing UAS fleet, contracting options, etc.). Determine capability, availability, and cost to meet the mission requirements. Assuming that the business or technical case does not support the use of existing fleet or contracting options to meet the requirement; develop an acquisition strategy to meet the requirement. Once an acquisition strategy has been developed, use the USACE UAS Working Committee as a resource to determine if existing UAS contracts within USACE or PEO AVN can satisfy the acquisition strategy.

(3) If existing contracts for UAS cannot meet the acquisition strategy, a new procurement should be initiated. After the acquisition has been completed, the district will ensure that the required metrics are reported to USACE HQ DOL.

(4) Maintain property accountability according to established procedures such as Automated Personal Property Management System (APPMIS), CATALOGING, etc.

7. Army Requirements and Coordination.

a. An Airworthiness Release (AWR) is required to operate any Army aviation asset and access the NAS.

(1) The AWR authorizes operation for a combination of a specific system type and configuration, geographically defined location(s), and the group operating the system using specific operational procedures. The AWR is not transferable to other USACE elements or groups. AED is the Airworthiness Authority for UAS operated by any group. The prerequisites for submitting for an initial AWR for specific system are described in section 7.a and 7.b. A flow chart showing the general process to obtain an AWR and access to NAS to operate UAS is provided in Figure 3.

(2) As part of the AWR application for a particular system, a district must establish a System Safety Management Plan (SSMP), a System Safety Working Group (SSWG) as part of the SSMP, and a Standard Operating Procedure (SOP) to operate the UAS. See Figure 4 for the relationships between processes and structures that AED requires to obtain a Level 3 AWR for a particular UAS family. Section 8 describes the significance and limitations of the Level 3 AWR.

b. The salient requirements for the SSMP, SSWG and SOP are described as follows:

(1) The SSMP defines a Material Risk Assessment Process used to evaluate and quantify risks. Having a SSMP complies with MIL-STD-882E, Standard Practice for System Safety, and is evidence that the risks of the system have been considered and appropriate controls are in place to mitigate these risks. The SSMP contains A Risk Acceptance matrix based on the consequence and probability of the risks and the appropriate command authority for difference levels of risk defined. A Composite Risk Management (CRM) form (DA7566 recommended) documents the risk assessment for each location. A Risk Acceptance Memo for each mission location is signed by an appropriate command authority as it is defined in the SSMP for each location and required as part of the AWR process.

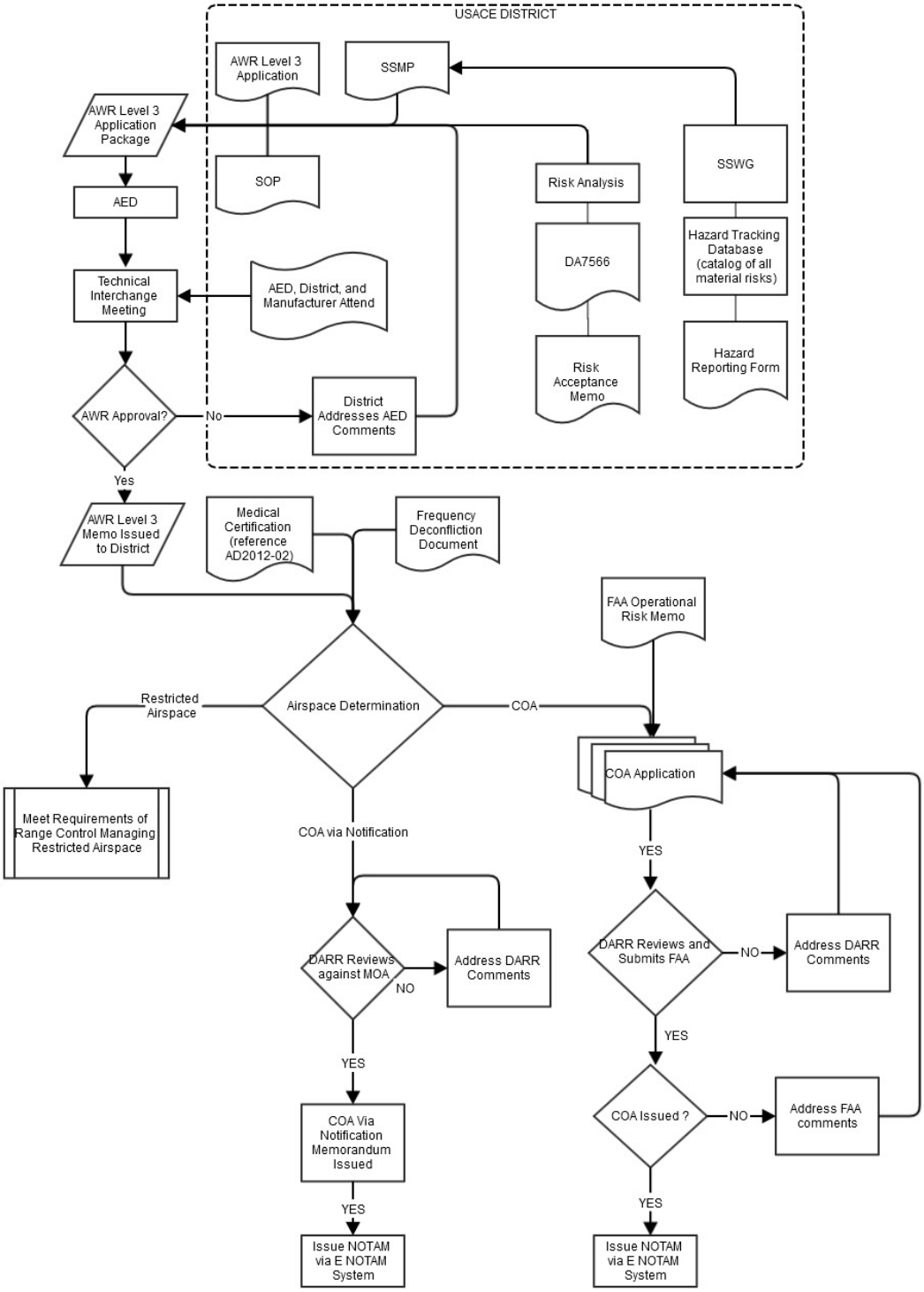

Figure 3. Flow chart outlining the process to obtain an AWR and access the NAS to operate a UAS.

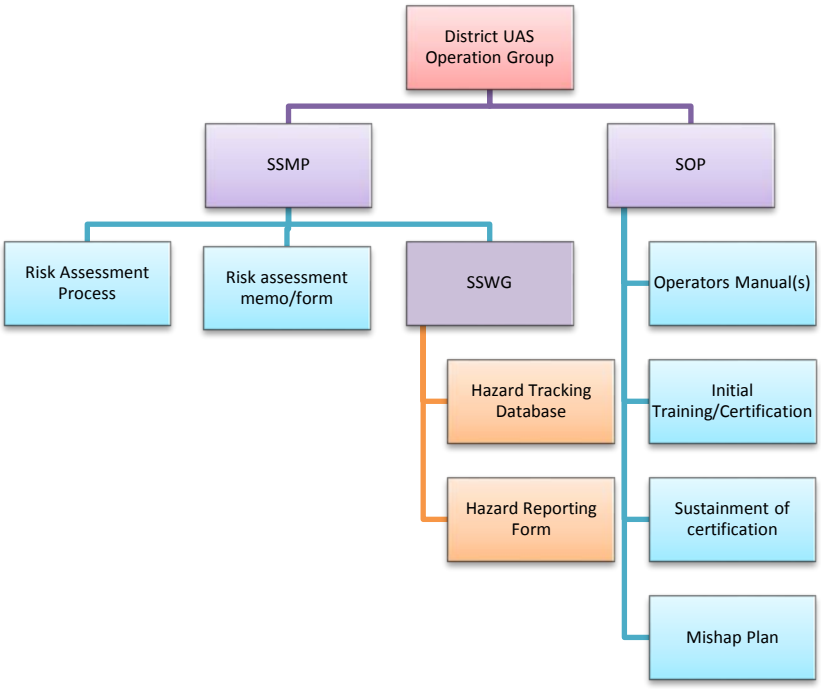

Figure 4. Diagram of the relationships between SSMP, SSWG and SOP that is part of the required structure for district to operate UAS.

(2) The SSWG is formed as part of the SSMP with the task of tracking system safety for the lifecycle of the system. The group periodically meets to address safety issues, monitor risks, and address reported risks. The SSWG maintains a Hazard Tracking Database to monitor risks. Generally, a Hazard Reporting Form for new hazards identified is used to report risks to the SSWG. Hazards are tracked until corrective actions or mitigations are in place. Once the hazard is mitigated the SSWG can close that hazard.

(3) The SOP defines the proponent's operational plan for the UAS and is defined locally. The SOP should include a process for training, certification and sustainment for qualifications of UAS operators regarding a specific system. The SOP should include standard checklists, Mishap Plan, Operators Manual and other documentation and processes necessary to operate the UAS safely. PEO AVN recommendation is that the SOP should conform to Technical Circular 3-04.46 desirable.

8. PEO AVN. PEO AVN is an aviation combat weapons platform developer/purchaser and system sustainer of systems for the Warfighter. The Product Management Office Small Unmanned Aircraft Systems (PM SUAS), a subgroup of PEO AVN, has contract mechanisms for SUAS systems and services that are designed to meet requirements developed in support of their mission. Pursuant to references i. and j. of this EC, all contracts for UAS shall be coordinated with PEO AVN (PM SUAS) to include acquisitions in support of Civil Works activities.

9. AED and AWR. AR 70-62 requires that all Army aircraft have an AWR prior to operation. AED has authority to provide an AWR for respective systems. AED is a fee for service organization that will require funding to review AWR applications and participate in ongoing SSWG meetings. To support continued UAS operations and comply with AR 70-62, AED-UAS Division developed the three levels of airworthiness approach. Level 3 covers aircraft with no airworthiness pedigree, an unknown reliability and is expected to have a higher mishap rate. This process is safety case based and considerations encompass all safety aspects of operating the UAS including, but not limited to, who the operator is, where it is operated, and how it is operated. Level 3 AWRs are Location-specific, configuration-specific, and organization-specific authorizations to operate UAS within specified limits that include who, where, and how the aircraft is operated. An application for an AWR from AED consists of the following items:

a. AWR Level 3 Application. The Application requests information on the following items: manufacturer, system characteristics, components, flight controls software block diagram, flight control system component layout and analysis, avionics block diagram, autopilot functional block diagram, propulsion system(s), navigation system, software, control station, payloads, frequency management, safety considerations and operational data.

b. Required Documents to include with the application.

(1) Operators Manual.

(2) Configuration Management Document.

(3) COA Criteria Checklist (when applicable).

(4) System Safety Assessment, Risk Assessment, and/or Safety Assessment Report (required for larger fielding).

(5) Agency Standard Operating Procedure (SOP).

(6) Signed Material Risk Acceptance Memo (for each mission and/or location).

(7) Proponent System Safety Management Plan (SSMP).

c. Initial AWR applications take approximately 20 business days for review. Also, AED will require a Technical Interface Meeting to examine the UAS and the proponents' operational procedures. Subsequent applications to access additional locations for systems with an existing AWR take approximately 10 business days. Review times are highly dependent on AED workload, completeness of applications, and the complexity of the UAS system and missions being evaluated.

d. New AWR's shall be reported to the USACE UAS Working Committee. At a minimum, the reporting requirement is the area covered by the AWR defined in a shapefile, with attributes describing, district Point of Contact (POC), AED POC, system type(s), effective date, expiration date and copy of the AWR once it is issued by AED.

10. United States Army Aeronautical Services Agency (USAASA), the Department of Army Regional (DAR) Representative and Accessing the NAS. All airspace in the United States is regulated by the FAA. Restricted Airspace is delegated within the NAS to the respective service (see reference b.). Operations outside of restricted airspace require Certificate of Authorization or Waiver (COA) from the FAA. The DOD and FAA have a Memorandum of Agreement (DoD-FAA MOA) that prescribes expedited processes to access certain classes of airspace by "COA via Notification" for UAS under 55 lbs. USAASA represents Headquarters Department of Army (HQDA) at the national and international level for airspace and aeronautical matters and provides Army representatives to the FAA's national headquarters three service centers. The DAR reviews requests to access the NAS to insure conformance with the DOD and FAA MOA in addition to Army policies, regulations, and guidance. Requests to access the NAS are submitted to the FAA by the DAR on behalf of the USACE proponent operating the UAS. In some cases, the local DAR may establish an account with the FAA UAS COA Online System for USACE district's to input their requests to access the airspace; however, the DAR must review the application before submitting the case to the FAA review. Requests to access the air space under "COA via notification" as described in the DOD and FAA MOA take approximately 10 business days. In cases where a standard COA is required, requests take up to 60 business days for review by the FAA once the case is submitted by the DAR.

11. The Use of UAS systems by the Public or Commercial Organizations at USACE Water Resources Development Projects

a. The USACE regulation regarding the public and commercial operation of aircraft, including UAS, is contained in 36 CFR, Chapter III, Part 327.4, Aircraft, which states in part, "the operation of aircraft on project lands at locations other than those designated by the District Commander is prohibited. No person shall operate any aircraft while on or above project waters or project lands in a careless, negligent or reckless manner so as to endanger any person, property or environmental feature." UAS operation for hobby, recreational, and/or commercial purposes at USACE water resources development projects is prohibited unless authorized by the District Commander. This regulation applies to individuals operating any UAS over USACE water resources development projects regardless of the location of the operator, including over outgranted Corps property under a lease agreement with a third party.

b. Since UAS operation can be a safety and security risk to USACE infrastructure, as well to staff, visitors, environmental features, and wildlife at USACE projects, all private and public recreational/hobby and/or commercial use of UAS must satisfy all FAA requirements, applicable state and local laws, and USACE regulations.

c. District Commanders may delegate the authority through the District Chief of Operations for General District Policy Guidance to the Operations Project Managers to determine the specific locations and/or specific conditions on or above a USACE water resources development project where the public can safely operate UAS. Specific conditions shall be posted pursuant to 36 CFR 327.12, Restrictions. A special use permit, in accordance with EC 1130-2-550, Chapter 9, and 36 CFR, Chapter III, Part 327.18, will be issued for commercial operation.

d. No person shall operate a UAS:

(1) In a careless, negligent, or reckless manner so as to endanger, threaten, harass, or jeopardize any person, property, wildlife, environmental feature, or interfere with the use or operation of the project. Examples of such prohibited behavior include capturing images of unsuspecting/unwilling persons or attaching firearms or other weapons onto the UAS.

(2) Within 500 feet of operational areas. Operational areas are defined as land on which project operational structures are located (i.e. dams, hydropower plants, administrative and maintenance buildings, visitor centers and associated support facilities). Larger restricted zones can be established where applicable. UAS operation that violates the designated operational area prohibition will be reported in the ENGLink system as a Suspicious Activity Report (SAR) IAW USACE Operation Order 2014-32 (Integrated Protection) Annex R – Reports - Information and Intelligence Flow.

e. UAS will be operated:

(1) In accordance with applicable state and local laws and FAA regulations, including any UAS registration requirements.

(2) During daylight hours only, and while maintaining Visual Line of Sight (VLS) of the unmanned aerial vehicle while in operation.

f. UAS operators are liable for damage to any public property, including USACE property, resulting from operating their UAS or any other activity associated with operating their UAS.

g. Violation of the above policy can be cited under 36 CFR, Chapter III, Part 327.4, Aircraft or Part 327.12, Restrictions.

12. UAS Revolving Fund Account. HQ RM has established a revolving fund account for UAS, RF5026-UNMANNED AIRCRAFT SYSTEM (UAS), to record and distribute the cost of UAS operations. Costs will be distributed on a monthly basis. District offices shall charge costs to the RF5026 account arising from the districts UAS program.

13. Example Documents. Examples of the regulations, memorandums, required documents and references are available on the Small UAS (SUAS) Community of Practice SharePoint site at the following link under “Shared Documents”:
https://cops.usace.army.mil/sites/GEO/SUAS/default.aspx .

14. Proponent. The HQUSACE proponent for this interim guidance is the Engineering and Construction Division, Directorate of Civil Works.

JAMES C. DALTON P.E.
Chief, Engineering and Construction
Directorate of Civil Works

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Appendix A

List of Acronyms

AED	Army Aviation Engineering Directorate
AMC	Army Materiel Command
AMRDEC	Aviation and Missile Research, Development, and Engineering Center
ASA	Assistant Secretary of the Army
AWR	Airworthiness Release
COA	Certificate of Authorization or Waiver
DAR	Department of the Army Regional Representative
FAA	Federal Aviation Administration
HQDA	Headquarters Department of the Army
NAS	National Airspace System
OMB	Office of Management and Budget
PEO AVN	Program Executive Officer Aviation
PM SUAS	Small Unmanned Aircraft Systems Product Office
PM UAS	Unmanned Aircraft Systems Project Office
SOP	Standard Operating Procedures
SSMP	System Safety Management Plan
SSWG	System Safety Working Group
SUAS	Small Unmanned Aircraft Systems
TRADOC	U.S. Army Training and Doctrine Command
UAS	Unmanned Aircraft Systems
USAASA	U.S. Army Aeronautical Services Agency
USACE HQ DOL	U.S. Army Corps of Engineers Directorate of Logistics
USACE HQ	U.S. Army Corps of Engineers Headquarters
USACE	U.S. Army Corps of Engineers

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