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MEASUREMENT  
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**DOE G 440.2B-2A  
10-17-08**

**IMPLEMENTATION GUIDE  
AVIATION MANAGEMENT, OPERATIONS,  
MAINTENANCE, SECURITY, AND SAFETY  
for Use with DOE O 440.2B Chg 1  
*Aviation Management and Safety***

*[This Guide describes suggested nonmandatory approaches for meeting requirements. Guides are not requirements documents and are not to be construed as requirements in any audit or appraisal for compliance with the parent Policy, Order, Notice, or Manual.]*

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**U.S. DEPARTMENT OF ENERGY**  
Office of Aviation Management

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## FOREWORD

This Department of Energy (DOE) Implementation Guide is approved for use by the Office of Aviation Management (OAM) and is available for use by all DOE/NNSA elements and their contractors. This Guide is applicable to DOE O 440.2B Change1, *Aviation Management and Safety* (hereafter referred to as DOE O 440.2B or Order), to the policy that created that Order, and the requirements that are part of that Order.

Beneficial comments (recommendations for changes, additions, or deletions) should be sent to the Director, Office of Aviation Management (MA-30), U.S. Department of Energy, 1000 Independence Avenue, SW, Washington, DC 20585, by letter or by sending the self-addressed Standardization Document Improvement Proposal (DOE F 1300.3) in Attachment 1.

This Guide provides supplemental information regarding the expectations of the Department on specific provisions of DOE O 440.2B. It identifies acceptable methods of implementing the Order, although other methods may also be acceptable. It identifies relevant principles and practices by referencing Government and non-Government standards. The discussions on methods and approaches and other information are intended to be useful in understanding and implementing the requirements of the DOE O 440.2B.

The use of this Guide will facilitate consistency in implementing the DOE O 440.2B and help ensure that all of the provisions of the Order are addressed. This Guide will not supersede any requirements of the Order. The word "should" is used throughout this Guide to indicate a recommended practice to meet DOE O 440.2B. The word "shall" is used because it denotes an action(s) that must be performed if a requirement in the Order, Federal Regulation or Office of Management and Budget policy is to be met.

The statements in this Guide are not substitutes for requirements. If a statement or provision from this Guide is explicit in a contract or a plan required by a DOE Rule, an enforceable obligation is created by those documents. Additionally, implementation plans or policy documents that reference a procedure as the intended methodology to accomplish an action cause the referenced parts to become mandatory.



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## CHAPTER I. INTRODUCTION

- 1. Overview of the Department's Aviation Program:** Government aircraft are used to support the four core programs: Energy Security, Nuclear Security, Scientific Discovery and Innovation, and Environmental Responsibility [DOE 2006 Strategic Plan]. The types of aircraft operations that support these programs are: cargo, hazardous materials, and personnel transportation; aerial patrol such as pipeline, power line, and security; aerial photography; research and development; aerial survey such as atmospheric, biological, environmental, and radiological assessment; aerial applications; rotorcraft external load operations for construction, surveys, or decommissioning activities. In addition, the DOE owns, operates, or uses Unmanned Aircraft (UA) Systems (UAS). UA are aircraft [Title 14 CFR Part 1] and have formerly been referred to as unmanned air vehicles (UAV) or Remotely Operated Aircraft (ROA). UAS are used for atmospheric research, sensor development, or research and development for proof of operational concepts to support Nuclear Security and Science programs. Additionally, a varying number of Commercial Aviation Services (lease, contract, rental, and charter) aircraft are used by DOE. Aviation operations range from the use of a single aircraft to complex missions involving numerous aircraft.

The Secretary of Energy issued DOE O 440.2B, *Aviation Management and Safety*, to institutionalize a framework within which the aviation program of DOE and NNSA is conducted. DOE O 440.2B establishes requirements to assure the effectiveness, efficiency, security, and safety of the aviation programs conducted by the DOE. The DOE has also developed metrics used to measure the efficiency, effectiveness, and safety of these programs are departure reliability, mission capability rates, dollars, time, and the elimination of injuries and losses in the Department's aviation operations. The aviation metrics can be found in DOE G-440.2B-1, *Aviation Performance Indicators*.

The ultimate responsibility and accountability for ensuring adequate protection in the operation of DOE facilities (aircraft in this case), while meeting the requirements of programs, rests with DOE line management. Where contractors are employed to plan and conduct work at DOE facilities, DOE line management fulfills this responsibility by establishing expectations, contractual requirements, overseeing compliance, and managing contracts. The Field element, and in some cases the program, Federal manager has overall responsibility for the program, but the line management rests with the field element's Federal Aviation Manager/Aviation Program Manager (AvM/APM) or Federal Aviation Safety Officer (ASO) who has direct responsibility for the aviation operations and safety. The Federal AvM/APM or Federal ASO generally is also assigned as a Contracting Officer's Representative (COR) to manage the contract, establishes expectations, and oversees compliance to the contract. In most DOE locations a contractor is also assigned as a collateral duty, or in other cases full time, AvM/APM and/or ASO who has responsibility for implementing the Field element's Aviation Implementation plan and/or the contractor's policy documents regarding aviation use, reporting, safety and management. However, in the case of aircraft operations, Federal law gives the operator (may be a Federal element or contractor in some cases) and the

pilot in all cases, ultimate authority over the safety and operation of the aircraft during its operation.

The responsibility for implementing the requirements of DOE O 440.2B is applicable to the requirements and rules governing DOE and NNSA elements and their contractors that conduct or hire aviation operations of any kind using DOE-Federal aircraft, Commercial Aviation Services providers, or other government aircraft. These requirements are not applicable to domestic official travel of individuals, or the shipment of cargo, on scheduled United States Flag air carriers. Most of the requirements are not applicable to aircraft under the operational control of other Federal and State agencies or the Department of Defense.

To facilitate and improve communications within the Department, the Secretary of Energy appointed the Director, Office of Aviation Management (OAM) as the DOE Senior Aviation Management Official and an Aviation Board of Directors. The OAM Director is responsible for the policy, requirements, implementation guidelines, and technical standards of the Department's aviation programs. The OAM Director is also responsible for: providing independent oversight, technical assistance and guidance and is the final point for the collection, retention, evaluation, and dissemination of aviation information; representing the Department to other government agencies concerning aviation operations, safety, security and airworthiness and reporting issues; and approving aviation implementation documents or plans. In addition, the OAM Director exercises the decision authority on requests for variances to the requirements within the program and for the acquisition and disposal of Federal aircraft.

The OAM Director chairs the Aviation Board of Directors. The members of the Aviation Board of Directors come from the Headquarters Program Offices and DOE/NNSA Field elements that are responsible for the day-to-day management of aviation. The Aviation Board of Directors recommends broad policy and procedures for the procurement, operations, safety, security and disposal of DOE-Federal aircraft and aviation services to the Director, OAM who then submits changes through the Departmental policy review process.

The requirements in DOE O 440.2B are delineated in seven broad groups; management, qualification, training, aviation operations, airworthiness, security, safety, reporting and official travel on aircraft. An aviation implementation plan (See Attachment 3, Definitions) detailing the policies and procedures for complying with the Order is required to be submitted for review and approval. The aviation operations and airworthiness requirements pertain to civil and public aircraft operations. Departmental standards for civil and public aircraft are equal to or more stringent than those in Title 14 CFR, Chapter 1, *Federal Aviation Regulations*. Since adopting these requirements, the DOE has reduced its overall aircraft and fatality rates significantly.

- 2. PURPOSE OF THE GUIDE:** This Guide provides detailed information to help all personnel, responsible for a part of the aviation program, understand and comply with the



rules and regulations applicable to their assignments. By so doing, the goals and missions of the Department will be achieved.

This Guide has been prepared to assist DOE Field elements in complying with DOE O 440.2B. It presents an acceptable way to comply with each of the requirements applicable to the various components of the aviation program of the Department.

This Guide is formatted in broad and narrow areas because of the nature of the subject matter. It is not meant to be all-inclusive. For those subjects not presented in detail, there are references that contain additional information. For additional information, contact the Director, Office of Aviation Management or your local Federal Aviation Administration (FAA) office.

3. **SUGGESTIONS FOR IMPROVEMENT OF THE GUIDE:** To be useful, this Guide must be accurate, current, and complete. This Guide must be a living document and reflect the needs of the users and changes that occur with time.

Users are urged to provide beneficial comments for improving this Guide. The comments should be sent to the Director, Office of Aviation Management (OAM), U.S. Department of Energy, 1000 Independence Avenue, SW, Washington, DC 20585, by letter or by sending the pre-addressed Standardization Document Improvement Proposal (DOE F 1300.3) in Attachment 1 to this Guide.



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## CHAPTER II. APPLICATION

- 1. DOE AND CONTRACTOR AVIATION ELEMENTS:** This Guide is applicable to the requirements and rules governing DOE/NNSA elements and to contractors of DOE/NNSA elements that conduct aviation operations of any kind using DOE-Federal aircraft, Commercial Aviation Service providers, or other government aircraft not under the ownership or control of DoD. The guidance is generally not applicable to the requirements governing domestic or foreign travel by individuals, or the shipment of cargo, on scheduled U.S. Flag air carriers.
- 2. SCOPE OF THE GUIDE:** This Guide encompasses the requirements for the operation of public and civil aircraft operations by DOE/NNSA elements and DOE contractors. One preferable way to comply with each requirement is presented and discussed in “DISCUSSION” sections of this Guide, alternatives that achieve the same results or level of effectiveness, efficiency or safety may be used.

DOE and Federal Regulations are both performance-oriented and specification-oriented. Methods to comply with the former are given in Federal Aviation Administration (FAA) Advisory Circulars, General Services Administration acquisition letters, Department of Energy Acquisition guides or Office of Management and Budget transmittal memorandum. The circulars, letters or memorandum are referenced in this Guide, but not contained herein. References to other advisory and standards documents also are given. Sample manuals and documents may be requested from the Director, Office of Aviation Management (OAM), GSA, FAA, or Office of Management Procurement and Assistance Management.

This Guide contains general principles and suggestions for all types of aviation missions. It does not, however, contain details specific to every type of aviation operation conducted in the DOE program. Technical assistance and policy guidance for unique operations should be requested from the Director, Office of Aviation Management.



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## CHAPTER III. ALTERNATIVE APPROACHES AND METHODS

- 1. Discussion:** This Guide contains technical standards, minimum expectations for performance and preferable methods necessary for complying with the requirements for DOE public and civil aircraft operations. The methods presented may not be entirely appropriate for the specific aviation operation conducted by a DOE element or their contractor. In such cases, an alternate approach that meets the intent and minimum expectations of this guide may be presented in the implementation plan, policy document or procedure of the DOE Field element. Each Field element must establish risk management protocols (Integrated Safety Management) [DOE M 450.4-1 and DOE O 440.2B] for aviation operations or maintenance, and for aviation operations outside those recognized by this guide or established within the Field elements approved aviation implementation plan or policy document. Use of the alternate approach or method should result in at least an equivalent level of effectiveness, efficiency, security, and safety as the compliance methods given herein.
- 2. General Information:** Under current law, aircraft owned by the Federal government or in service to the Federal government (government or public aircraft) are normally not subject to FAA oversight or required to comply with FAA regulations, except for certain FAA air space rules that apply to all aircraft operations. However, the FAA retains jurisdiction over the airworthiness of an aircraft, if the aircraft has been issued a FAA Certificate of Airworthiness (C of A). All DOE aircraft hold current C of As and regardless of the aircraft's operational status (government, public or civil) must comply with applicable FAA airworthiness rules. The FAA also has jurisdiction over "civil" aircraft operations. Civil operations are those flights that transport personnel to give speeches or attend meetings, conferences, political events, site visits, or training not associated with the operation or duties on-board a government aircraft. All other flight operations by definition are "public" flights. It is also important to understand that an individual does not have the authority to declare an aircraft operation as civil or public, because law defines these terms and activities. Because of this diversity, several of the Federal Aviation Administration (FAA) regulations are noted in DOE O 440.2B and this Guide. The "GENERAL" AND "DISCUSSION" sections of each Chapter in this Guide contain details on the requirements in DOE O 440.2B and the FAA regulations.



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## CHAPTER IV. AVIATION PROGRAM MANAGEMENT

1. **Purpose:** The purpose of this section is to ensure that an adequate management structure exists for an effective, efficient, secure, and safe aviation operation based on the size and scope of operations.
2. **Applicability:** This section sets forth the recommendations for the establishment of an aviation management structure for all DOE/NNSA elements, including contractors at each site.
3. **General:** The management structure of the DOE/NNSA aviation programs are modeled after Federal Aviation Administration certificated air carriers and most corporate aviation programs. In some cases within the DOE, the type of aircraft operation conducted mandates the management structure [14 CFR part 119, Certification: Air Carriers and Commercial Operators].

The DOE and NNSA structure includes a designated Senior Aviation Management Official, a Board of Directors, and aviation staff at DOE Headquarters. In addition, the structure also includes designated Federal Aviation Managers and Aviation Safety Officers in the field, who oversee the day-to-day aviation operations, whether the operation is federally owned or contracted commercial aviation services. The Federal aviation management and safety personnel ensure that DOE and NNSA aviation operations are effective, efficient, secure and safe; that Departmental and contractor personnel are qualified and trained; that aircraft, whether Federal or Commercial Aviation Services are airworthy; and there is compliance with policy statements, regulations, requirements, and procedures.

### 4. Responsibilities

- (a) **The Secretary of Energy:** Is responsible for appointing a Senior Aviation Management Official and an Aviation Board of Directors.
- (b) **Administrator of Nuclear Security:** Is responsible for approving aviation implementation plans (AIP) submitted by National Nuclear Security Administration (NNSA) elements after receiving a recommendation from the Director, Office of Aviation Management. In addition, the Administrator implements effective aviation operations, airworthiness, security and safety programs that meet the requirements of the DOE O 440.2B. The Administrator also identifies the major facilities management or support service contracts to which the DOE O 440.2B, Contractor Requirement's Document applies.
- (c) **Office of Aviation Management (OAM) Director:** Serves as the DOE Senior Aviation Management Official and provides recommendations to the Secretary of Energy and the Administrator, NNSA, for the safe, efficient, secure and reliable management of aircraft used by DOE. In addition, the Director provides independent oversight of the aviation programs and generates reports [DOE O

414.1C] to the DOE program managers and to the Administrator, NNSA for elements within the NNSA on the effectiveness of the aviation programs. The Director also chairs the DOE Aviation Board of Directors and appoints candidates for Board membership.

The Director is responsible for implementing policies, procedures, practices, and systems that provide for the highest professional standards for aviation operations and airworthiness as well as for aviation safety, security, effectiveness and efficiency. The Director also approves the selections of the types of aviation assets or services required to carry out the respective aviation missions for DOE elements and independent operating entities that are not part of the NNSA. The approvals and recommendations for acquisition and disposal of aircraft are based on OMB Circular A-11 Exhibit 300 reports, business case studies, and OMB Circular A-76 studies, in collaboration with DOE program and Field elements. The OAM Director will review and make recommendations for or against selections to the Administrator for Nuclear Security submitted by NNSA elements. If a difference of opinion develops between the OAM Director, and the NNSA Administrator regarding selections of the types of aviation assets or services required, they will bring the issue to the Secretary or Deputy Secretary for resolution or direction. The OAM Director also provides for the final approval for the acquisition and disposal of Departmental aviation assets, approves AIPs for non-NNSA elements of DOE, and makes recommendations to the Administrator for Nuclear Security on the AIPs submitted by NNSA elements. The OAM Director is the approving authority for any deviations from or waivers to or from the requirements of the DOE O 440.2B for non-NNSA elements of DOE and makes recommendations regarding any deviations or waivers to the Administrator for Nuclear Security for NNSA elements.

(d) **Aviation Board of Directors (ABD) Membership:** The OAM Director, acting as Senior Aviation Management Official, is designated as Chairperson of the Board of Directors. The Board consists of members appointed by the Director from a list of nominees submitted by the DOE or NNSA program and field element managers. The Board may have a maximum of 20 members, consisting of one nominee for regular membership submitted from each of the following organizations:

- Office of Management
- Office of Aviation Management
- NNSA Defense Programs
- NNSA Defense Nuclear Nonproliferation
- NNSA Emergency Operations
- DOE Environmental Management



- DOE Office of Science (Office of Biological and Environmental Research)
- Health, Safety and Security (Site Security)
- Bonneville Power Administration
- Southwestern Power Administration
- Western Area Power Administration
- NNSA Office of Secure Transportation /Program Office of Aviation Operations (Los Alamos and Sandia National Laboratories)
- Chicago Office (Brookhaven, Argonne, and Fermilab)
- Idaho Operations Office (Idaho National Laboratory)
- Nevada Site Office
- Livermore Site Office (Lawrence Livermore National Laboratory)
- Oak Ridge Operations
- Richland Operations Office (Hanford and Pacific Northwest National Laboratory)
- Savannah River Site Office (Office of River Protection and SR Ecology Lab)
- Strategic Petroleum Reserve Program Management Office

The DOE ABD recommends broad policy, regulations, and procedures for the procurement, operations, airworthiness, safety, and disposal of DOE-Federal aircraft to the Director, OAM.

- (e) **Heads of Departmental Elements:** Elements that conduct aviation operations or acquire CAS aircraft within their programs. Develop and implement effective aviation operations, airworthiness, security and safety programs that meet the requirements of this Order. Identify the contracts to which the CRD applies. Notify the contracting office to incorporate the CRD into the affected contracts via the laws, regulations, and DOE directives clauses of the contracts. Ensure the effectiveness of contractor aviation operations, airworthiness, and safety programs. Appoint an Aviation Program Manager, ASO, or both, depending upon the scope of operations, number of aviation operations conducted or aircraft assigned. Recommends a person to the Director, OAM for appointment to the Aviation Board of Directors. Ensures OMB A-11, Exhibit 300 submissions for aircraft acquisitions or steady state programs are prepared and submitted annually.

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- (f) **Office of Health, Safety and Security’s Office Independent Oversight:** Coordinates with the OAM in developing and implementing an aviation safety and management audit and appraisal protocol process for independent aviation program oversight.
- (g) **Field Elements that Own Aircraft (Manned or Unmanned):** Elements with DOE federally-owned aircraft should have a Federal Aviation Manager and Aviation Safety Officer appointed by the respective Head of a DOE or NNSA Field element that oversees and manages the aviation operations for that element. The recommended minimum management positions responsible for DOE federally owned (Federal) aircraft will be covered in the following subparagraphs of this section. For recommended management qualification requirements refer to Chapter V.
- (h) Recommended Aviation Program Personnel at the Field or Headquarters’ element level overseeing, managing or operating DOE-Federal aircraft and/or Commercial Aviation services.
- (1) Each Field element that has Federal personnel managing and operating **more than three DOE-Federal aircraft (manned)** should have enough qualified management personnel in the following or equivalent positions to ensure safety and effectiveness in its operations:
- (i) Aviation Manager (Federal) or Director of Operations (Federal);
  - (ii) Chief Pilot (Federal);
  - (iii) Director of Maintenance (Federal); and
  - (iv) Aviation Safety Officer (Federal).
- (2) Each Field element that oversees and manages **more than three DOE-Federal aircraft (manned)** with **contractors operating and managing the aircraft**, should have enough qualified management personnel in the following or equivalent positions to ensure safety and effectiveness in its operations:
- (i) Aviation Manager (Federal);
  - (ii) Aviation Safety Officer (Federal);
  - (iii) Aviation Program Manager (Contractor) or Director of Operations (Contractor);
  - (iv) Chief Pilot (Contractor);
  - (v) Director of Maintenance (Contractor); and

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- (vi) Aviation Safety Officer (Contractor).
- (3) Each Field element that has Federal personnel managing and operating **less than three DOE-Federal aircraft (manned)** should have enough qualified management personnel in the following or equivalent positions to ensure safety and effectiveness in its operations:
    - (i) Aviation Manager (Federal) and/or
    - (ii) Aviation Safety Officer (Federal).
  - (4) Each Field element that oversees and manages **less than three DOE-Federal aircraft with contractors operating and managing the aircraft (manned)**, should have enough qualified management personnel in the following or equivalent positions to ensure safety and effectiveness in its operations:
    - (i) Aviation Manager (Federal) and/or
    - (ii) Aviation Safety Officer (Federal); and
    - (iii) Director of Operations (Contractor); or
    - (iv) Chief Pilot (Contractor); and
    - (v) Director of Maintenance (Contractor).
  - (5) Each Field Element or Headquarters' Program that hires or utilizes only Commercial Aviation Service providers on an occasional basis or infrequent basis, should appoint a collateral duty Federal Aviation Manager and/or Federal Aviation Safety Officer or request support from the Director, Office of Aviation Management or a field element with experienced aviation management staff.
  - (6) Each Field Element or Headquarters' Program that owns, manages, or operates unmanned aircraft systems (UAS), should assign a Federal Aviation Manager and/or Federal Aviation Safety Officer, if not already assigned, to oversee and manage the UAS operations.
- 5. Discussion:** Upon request by the Field or Headquarters' element manager, the OAM Director may concur with and recommend approval of different positions or numbers of positions than those listed in paragraphs (f) (1) – (5), of this Chapter for a particular operation, if the Field or Headquarters' element manager shows that it can oversee, manage and perform its operations safely and effectively under the direction of fewer or different categories of management personnel.

**6. Applicable Standards**

DOE O 440.2B Change 1, Aviation Management and Safety

41 CFR part 102.33, Federal Management Regulations

14 CFR Chapter 1, Part 119, Certification of Commercial Operators

**7. Supplemental Guidance**

NBAA Aircraft Management Guide

HAI SAFETY MANUAL

## CHAPTER V. MANAGEMENT AND PERSONNEL QUALIFICATIONS

1. **Purpose:** The purpose of this Chapter is to ensure that management personnel have the competence, skills, and are adequately qualified commensurate with their assigned duties to ensure the effectiveness, efficiency, security and safety of aviation operations.
2. **Applicability:** This chapter is applicable to all DOE/NNSA elements, including contractors at each site that use, own, or operate government aircraft. The recommendations in this Chapter are mandated by Federal Regulation or DOE policies and orders. [Reference 14 CFR parts 61 and 91, 41 CFR part 102-33, DOE P 426.1 and DOE M 426.1-1A, and DOE O 440.2B]
3. **General:** The qualifications of aviation management and safety personnel of the DOE and NNSA aviation programs are modeled after Federal Aviation Administration certificated air carriers and most corporate aviation programs. The minimum Federal management positions listed in Chapter IV, paragraph 4 (f) responsible for DOE-Federal aircraft or CAS providers are covered in the approved DOE Functional Qualification Standards for DOE (Federal) Aviation Managers and (Federal) Aviation Safety Officers which require compliance within 18 months of assignment in accordance with DOE O 440.2B.
  - (a) Recommended Management Qualifications (Federal aircraft operations)
    - (1) Federal Aviation Manager: A person should not serve as an Aviation Manager unless he/she knows the contents of the Field element's policies and procedures manual and/or aviation implementation plan required by DOE O 440.2B, applicable DOE and NNSA policies, the provisions of this guide and other applicable regulations necessary for the proper performance of the person's duties and responsibilities. The person should have completed or be able to complete the Functional Qualification Standard for DOE Aviation Managers within 18 months of assignment. This person will have the overall responsibility for ensuring the aircraft operations conducted by the Field element are effective, efficient, secure and safe and in compliance with DOE O 440.2B, applicable Federal Aviation Regulations, Federal Management Regulations, Federal Travel Regulations, and OMB circulars A-11, A-76, and A-126.
    - (2) Director of Operations (Federal or Contractor): A person should not serve as Director of Operations unless that person knows the contents of the Field elements policies and procedures manual and/or aviation implementation plan required by DOE O 440.2B, the provisions of this guide and other applicable regulations necessary for the proper performance of the person's duties and responsibilities and:
      - (i) The Director of Operations of a Field element conducting any operations for which the pilot-in-command is required to hold an

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Airline Transport Pilot certificate under 14 CFR Part 61 or required by the Field element should:

- 1 Hold or have held an Airline Transport Pilot certificate; or
  - 2 Have at least 3 years of experience as pilot-in-command of an aircraft in the civil government, military, or operated under 14 CFR parts 121, 125, or 135; or
  - 3 Have at least 3 years of experience as Director of Operations in civil government, military or with a certificate holder operating under 14 CFR parts 121, 125, or 135.
- (ii) The Director of Operations of a Field element who is not conducting any operation for which the pilot-in-command is required to hold an Airline Transport Pilot certificate under 14 CFR Part 61 or required by the Field element should:
- 1 Hold or have held a commercial pilot certificate; or
  - 2 Have at least 3 years of experience as a pilot-in-command of an aircraft operated in the civil government, military, or operated under 14 CFR parts 121, 125, or 135; or
  - 3 Have at least 3 years of experience as Director of Operations in civil government, military or with a certificate holder operating under 14 CFR parts 121, 125, or 135.
- (3) Chief Pilot (Federal or Contractor): A person should not serve as Chief Pilot unless that person knows the contents of the Field elements policies and procedures manual, training manual, and/or aviation implementation plan required by DOE O 440.2B, DOE and NNSA policies, the provisions of this guide and other applicable regulations necessary for the proper performance of the person's duties and responsibilities, and:
- (i) The Chief Pilot of a Field element conducting any operation for which the pilot-in-command is required to hold an Airline Transport Pilot certificate under 14 CFR Part 61 or required by the Field element should:
- 1 Hold a current Airline Transport Pilot certificate with appropriate ratings for at least one of the types of aircraft used;

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- 2 Hold a current Flight Instructors Rating in the category and class of aircraft to be operated and hold an Instrument Instructors Rating, if flight operations are conducted under instrument conditions; and
          - 3 Have at least 3 years of experience as a pilot-in-command of an aircraft under 14 CFR parts 121, 125, or 135 or military or civil government service.
        - (ii) The Chief Pilot of a Field element who is not conducting any operation for which the pilot-in-command is required to hold an Airline Transport Pilot certificate under 14 CFR Part 61 or required by the Field element should:

          - 1 Hold a current, commercial pilot certificate with an instrument rating. If an instrument rating is not required for the pilot-in-command, the Chief Pilot must hold a current, commercial pilot certificate;
          - 2 Hold a current Flight Instructors Rating in the category and class of aircraft to be operated and hold an Instrument Instructors Rating, if flight operations are conducted under instrument conditions; and
          - 3 Have at least 3 years of experience as a pilot-in-command of an aircraft under 14 CFR parts 121, 125, or 135 or military or civil government experience.
      - (4) Director of Maintenance (Federal or Contractor): A person should not serve as a Director of Maintenance unless that person knows the maintenance sections and contents of the Field element's policies and procedures manual and/or aviation implementation plan required by DOE O 440.2B, DOE and NNSA policies, the provisions of this guide and other applicable regulations necessary for the proper performance of the person's duties and responsibilities, and:

        - (i) Hold a mechanic certificate with both airframe and power plant ratings;
        - (ii) Have at least three years of maintenance experience as a certificated mechanic on aircraft, including, at the time of appointment as Director of Maintenance, the recent experience requirements of 14 CFR part 65, Section 65.83 of the FAR in the same category and class of aircraft used by the Field element, or at least three years of experience with a certificated airframe repair station, including one year in the capacity of approving aircraft for return to service; and

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- (iii) Have at least 3 years of experience as Director of Maintenance in civil government, military or with a certificate holder operating under 14 CFR parts 121, 125, or 135; or
  - (iv) Have at least 3 years of experience in a supervisory or inspector position with a certificate holder operating under 14 CFR part 145.
- (5) Aviation Safety Officer (Federal or Contractor): A person should not serve as an Aviation Safety Officer unless that person knows the operations, safety and maintenance sections of the contents of the Field elements policies and procedures manual and/or aviation implementation plan required by DOE O 440.2B, DOE and NNSA policies, the provisions of this guide and other applicable regulations necessary for the proper performance of the person's duties and responsibilities. A Federal Aviation Safety Officer must have completed or be able to complete the Functional Qualification Standard for DOE Aviation Safety Officer within 18 months of assignment [Federal only]. In addition, the person should:
- (i) Hold or have held an Airline Transport Pilot or Commercial Pilot certificate,
  - (ii) Have at least 3 years of experience as a safety professional, or
  - (iii) Has completed a civil industry, DOE, or military aviation safety management-training program.
- (6) Pilots (Federal or Contractor) manned aircraft:
- (i) Hold appropriate FAA ratings established by the Field element's policy documents, Federal Classification System (GS-2181, Pilot), or required by 14 CFR parts 61, 91, 121, 133, 135, or 137 in the category and class of aircraft operated;
  - (ii) Hold either Class I or Class II medical certificate established by the Field element's policy documents, Federal Classification System (GS-2181, Pilot), or required by 14 CFR parts 61, 91, 121, 133, 135, or 137;
  - (iii) Be qualified and proficient in the make and model of aircraft in accordance with the Field element's or operator's policy documents or as required by 14 CFR parts 61, 91, 121, 133, 135, or 137.
- (7) Pilots (Federal or Contractor) Tier I, II, and III unmanned aircraft:
- (i) Hold appropriate FAA ratings established by the Field element's policy documents, Federal Classification System (GS-2181, Pilot),



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- or required by 14 CFR parts 61 and 91 in the category and class of aircraft operated;
- (ii) Hold either Class I or Class II medical certificate established by the Field element's policy documents, Federal Classification System (GS-2181, Pilot), or required by 14 CFR parts 61 and 91; and
  - (iii) Be qualified and proficient in the make and model of aircraft in accordance with the Field element's or operator's policy documents or as required by 14 CFR parts 61 and 91.
- (8) Pilots (Federal or Contractor) Tier IV and V unmanned aircraft:
- (i) Hold appropriate FAA ratings established if required by the Field element's policy documents or required by 14 CFR parts 61 and 91 in the category and class of aircraft operated; or
  - (ii) Demonstrate through written or oral examination knowledge of the 14 CFR part 91 Subpart A General, Subpart B Flight Rules, Subpart C Equipment, Instrument and Certificate Requirements, Subpart D sections § 91.305, § 91.313, and § 91.319, and Subpart E Maintenance. A Federal official with sufficient knowledge must certify the pilot is qualified for the type of operations to be conducted.
  - (ii) Hold at least a Class III medical certificate or appropriate class required by 14 CFR parts 61 and 91;
  - (iii) Be qualified and proficient in the make and model of aircraft in accordance with the Field element's or operator's policy documents or as required by 14 CFR parts 61 and 91.
- (9) Maintenance Technicians and Repairmen (Manned Aircraft).
- (i) Hold appropriate FAA ratings established by the Field element's policy documents or required by 14 CFR parts 65;
  - (ii) Hold an FAA Inspector's Authorization if required by duty assignment or field element policy; and
  - (iii) Be qualified and proficient in accordance with the Field element's or operator's policy documents or as required by 14 CFR part 65.
- (10) Maintenance Technicians and Repairmen (Unmanned Aircraft—Tier I, II, and III).

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- (i) Hold appropriate FAA ratings established by the Field element's policy documents or required by 14 CFR parts 65;
  - (ii) Hold an FAA Inspector's Authorization if required by duty assignment or field element policy; and
  - (iii) Be qualified and proficient in accordance with the Field element's or operator's policy documents or as required by 14 CFR part 65.
- (11) Maintenance Technicians and Repairmen (Unmanned Aircraft—Tier IV and V).
- (i) Be trained in the manufacturer's maintenance program or hold appropriate FAA ratings, if established by the Field element's policy documents, or required by 14 CFR parts 65;
  - (ii) Be qualified and proficient in accordance with the Field element's policy and know the manufacturer's maintenance program or instructions.
- (b) Recommended Management Qualifications (CAS Only operations)
- (1) Federal Aviation Manager : A person should not serve as an Aviation Manager unless he/she knows the contents of the Field element's policies and procedures manual and/or aviation implementation plan required by DOE O 440.2B, applicable DOE and NNSA policies, the provisions of this guide and other applicable regulations necessary for the proper performance of the person's duties and responsibilities. A Federal Aviation Manager should have completed or be able to complete the Functional Qualification Standard for DOE Aviation Managers within 18 months of assignment. This person will have the overall responsibility for ensuring the aircraft operations conducted by the Field element are effective, efficient, secure and safe and in compliance with DOE O 440.2B, applicable Federal Aviation Regulations, Federal Management Regulations, Federal Travel Regulations, and OMB circulars A-11, A-76, and A-126. TQF is only applicable to Federal employees.
  - (2) Aviation Safety Officer (Federal or Contractor): A person should not serve as an Aviation Safety Officer unless that person knows the operations, safety and maintenance sections of the contents of the Field elements policies and procedures manual and/or aviation implementation plan required by DOE O 440.2B, DOE and NNSA policies, the provisions of this guide and other applicable regulations necessary for the proper performance of the person's duties and responsibilities. A Federal Aviation Safety Officer must have completed or be able to complete the Functional Qualification Standard for DOE Aviation Safety Officer within

18 months of assignment. In addition, a person assigned as an Aviation Safety Officer should:

- (i) Have at least 3 years of experience as a safety professional, or
- (ii) Has completed a civil industry, DOE, or military safety management training program; or
- (iii) Certified as a civil industry, DOE, or military safety professional.

(c) Incidental Pilot Guidance (Federal Personnel Only)

- (1) An organization may use the Field elements designated Federal Aviation Manager/Aviation Program Manager or Aviation Safety Officer, but not both, as an incidental pilot (DOE O 440.2B). The exception to this policy is when a DOE-Federal aircraft is under the “operational control” of a contractor who is a FAA certificated air carrier. Title 14 CFR parts 119, 135 and 121 restrict operators to using only pilots in their employ and under their control.
- (2) In those cases where the DOE-Federal aircraft are not managed and operated by a contractor certified by the FAA as an air carrier, a Federal employee may be used to act as an incidental pilot in accordance with DOE O 440.2B. The following requirements must be met:
  - (i) An incidental pilot must be a full-time Federal employee of DOE that is responsible for overseeing or managing DOE-Federal aircraft. The assigned aviation manager or safety professional must be responsible for the direct management or oversight of DOE-Federal aircraft.
  - (ii) The requirements of Section 4.h., 2.d of the Order 440.2B and this section of the guide do not apply to a Federal Aviation Manager or Aviation Safety Officer whose position description and primary duty is that of a Pilot, GS 2181.
  - (iii) The use of incidental pilots should be on a closely controlled and limited basis, to supplement or assess flight operations. The direction given in the Order was meant to limit the use of incidental pilots in flight programs that have a limited amount of annual flying. OAM is an advocate for aviation managers actively flying to ensure the operations are effective, efficient, secure and safe. However, because some of the emergency response and security programs are limited in the amount of annual flight hours, the intent of the Order was to have each manager or safety professional weigh the need to fly against that of impacting the full-time pilot’s (Federal or contractor) ability to maintain

proficiency. Therefore, each organization should determine the impact and benefit of using incidental pilots before deciding to do so.

(iv) The qualifications and processes for using these staff members must be included in the Field elements AIP and, if applicable, the contractor's aviation procedures or operations manual, refer to the Order 440.2B Section 4.h., 2.d.

(3) Deviation from this section may be authorized if the person has had equivalent aeronautical experience. The OAM Director may authorize a deviation for the Federal employees who are appointed as an Aviation Manager/Aviation Program Manager, Director of Operations, Chief Pilot, Director of Maintenance or the Aviation Safety Officer. If an organization needs to submit a deviation request to the Director, the organization should ensure the following:

(i) All documentation submitted should be verifiable and accurately state the experience and qualifications of the person;

(ii) Explain what additional training, if any, the organization intends to provide; and

(iii) Provide any other pertinent information that may be necessary to assist the Director in deciding to grant the deviation.

**4. Discussion:** The number and qualifications of management, safety pilot and maintenance personnel discussed in this Chapter are the minimum expectations for performance in the context of the requirements of DOE O 440.2B Section 4, Requirements, paragraphs e., h., and Section 5, Responsibilities, paragraph g.

It is the position of OAM that Federal Aviation Managers and Federal Aviation Safety Officers be involved with the aviation programs operationally as much as possible, to the extent allowed by regulation or law. The best method of evaluating the policies, processes, and procedures is to participate during actual operations. That is the purpose of DOE O 440.2B Section 4.h. (2) (d), establishing a baseline qualification for Federal management personnel who may participate as an incidental pilot. In addition, since an incidental pilot must meet the same proficiency and currency requirements as those of the full-time pilots, programs that have a limited flying program may be impacted substantially by using an incidental pilot. Other considerations prior to using an incidental pilot, would be contacting the Contracting Officer to determine, if the Federal Management Regulations, Federal Acquisition Regulations, Department of Energy Procurement Regulations, or the contract will allow an incidental pilot to operate the aircraft or act in the capacity as a Flight crewmember for operations that have contractors managing, operating, and maintaining Federal aircraft.

**5. Applicable Standards**

Title 41 CFR part 102-33, Federal Management Regulations

Title 14 CFR Parts 119 (Sections 119.65, 119.67, 119.69, and 119.71), 61, 65, 121, and 135

Classification Act of 1949, which has been codified in Chapter 51 of Title 5, United States Code

FAA Order 8900.1, Flight Standards Information Management System (FSIMS).

DOE O 360.1B, Federal Employee Training

DOE P 426.1, Federal Technical Capability for Defense Nuclear Facilities

DOE M 426.1-1A, Federal Technical Capability Manual

DOE O 440.2B Change 1, Aviation Management and Safety

DNFSB Approved Functional Qualification Standards for Federal Aviation Managers (DOE-STD-1165-2003) and Federal Aviation Safety Officers (DOE-STD-1164-2003)

**7. Supplemental Guidance**

Energy On-Line Learning Center (OLC <sup>2</sup>) Training for Aviation Managers and Safety Officers

Chapter VI and VIII, DOE G 440.2B-X



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## CHAPTER VI. FEDERAL AVIATION MANAGER AND FEDERAL AVIATION SAFETY OFFICER TRAINING PROGRAM

1. **Purpose:** The purpose of this section is to ensure qualification standardization, and to enhance the safety of aviation operations by ensuring key personnel have the competence, knowledge and skills commensurate with assigned responsibilities through appropriate training.
2. **Applicability:** This section is applicable to all DOE/NNSA elements that oversee, manage or operate government (Federally owned or Commercial Aviation Services) aircraft.
3. **General:** This document sets forth the recommended standards for the establishment and maintenance of a training program for DOE/NNSA Aviation Managers (AvMs)/Aviation Program Manager (APM) and Aviation Safety Officers (ASOs). No personnel should serve as a DOE/NNSA ASO or AvM/APM unless he/she has completed the appropriate initial or recurrent training phase commensurate with duties assigned. There are three basic categories of training applicable to DOE/NNSA AvMs and ASOs. The appropriate category of training is determined by the individual's previous experience, and duty position. At the conclusion of any category-training curriculum, the individual involved should be able to successfully demonstrate his/her knowledge of the regulations, policies, and procedures applicable to the specific block of instruction by correctly answering 90 percent of the questions on written tests.
  - (a) **Initial Assignment Training:** This training category is for personnel **who have not had previous experience** with DOE (newly hired personnel). It also applies, however, to personnel employed by DOE who have not previously held an AvM/APM or ASO position within DOE. Initial assignment training includes basic indoctrination training and training for a specific duty position. Since initial assignment training is usually the employee's first exposure to specific organization methods, systems, and procedures, it is also the most comprehensive of the three categories of training. The requirements of the Functional Qualification Standards (DOE-STD-1164-2003 and DOE-STD-1165-2003) can be found on the internet at:  
<http://www.hss.energy.gov/NuclearSafety/techstds/standard/standard.html#1001>.
    - (1) The initial assignment training for AvMs/APMs and ASOs can be found on the DOE On-line Learning Center (OLC<sup>2</sup>) at <https://olc2.energy.gov/plateau/user/login.jsp>. Search under DOE courses for DOE Aviation Manager and Safety Officer Training and the OMB A-126 courses. These courses satisfy most of the training needs of the Functional Qualification Program for an AvM/APM or ASO of the Department.

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- (2) Unique areas such as an organization's aviation implementation plans, policy manuals, aircraft operations, etc., need to be addressed through satisfactory completion of a written examination, satisfactory completion of an oral evaluation, satisfactory completion of an observed task or activity related to a competency, or documented evaluation of equivalencies. These may be assessed locally by a qualified person or call the Office of Aviation Management for assistance and evaluation.
  - (2) The Aviation Manager and Safety Officer course is presented in three sections, called Modules, with a post-test at the end. Module 1 presents the history and mission of the DOE aviation program and some of the management systems in place within the Department. Module 2 will provide training on the Directives System along with DOE O 440.2B, Aviation Management and Safety. Module 3 covers the aviation-specific parts of the Code of Federal Regulations. Once an individual has viewed all three modules, the person will complete a "post-test" that must be passed with 90% accuracy in order to receive credit for the course.
  - (3) The OMB A-126 course is presented in one Module, with no post-test at the end.
  - (4) The AvM/APM or ASO should contact the Office of Aviation Management to request access to the GSA Federal Aircraft Interactive Reporting System (FAIRS). Once access is granted, the AvM/APM may take the FAIRS training module on the GSA FAIRS website.
- (b) **Recurrent Training:** This category of training is for an AvM/APM or ASO who has been previously trained and qualified by DOE. The AvM/APM or ASO should receive recurrent training annually. If recurrent training has not been completed within 18 months of the AvM/APM or ASO's last training period, that individual must complete re-qualification training to maintain his/her qualification status.
- (1) The recurrent training for AvMs/APMs and ASO can be found on the DOE OLC <sup>2</sup> under DOE courses. The identified training satisfies most of the recurrent training for an AvM/APM or ASO of the Department.
  - (2) The following list also provides recommendations to sufficiently satisfy recurrent training:
    - (i) Office of Aviation Management Annual Aviation Operations and Safety Training Workshop (12 to 14 hours).
    - (ii) DOE Accident Investigation Course, sponsored by DOE's HSS organization.



- (iii) Helicopter Association International training courses.
- (iv) National Business Aircraft Association courses.
- (v) National Transportation Safety Board aviation courses.
- (vi) University of Southern California, Aviation Safety Officer Course.
- (vii) Emory Riddle College, Aviation Management and Safety Course
- (viii) University of Southern California, Human Factors Course
- (ix) Transportation Safety Institute, Risk Management
- (x) Transportation Safety Institute, Accident Investigation
- (xi) Transportation Safety Institute, Accident Investigation (Rotorcraft)
- (xii) Transportation Safety Institute, Accident investigation (Airplane)
- (xiii) GSA ICAP Biennial ASO Training

**(c) AvM/APM and ASO Curriculum (Refer to Tables)**

Initial Training Curriculum Table VI-1.0

<b>MODULE</b>	<b>SUBJECT</b>	<b>TRAINING</b>
1	History/Mission DOE Aviation Program History	3
2	Directives System	2
2.1	Introduction to Directives System	3
	CFRs	2
3.1	Introduction to CFRs -	8
4	Applicable Management Regulations/Reporting Requirements	3
5	Accident/Incident Scenarios and the DOE Safety Award Program	2
6	Typical Aviation Organizational Structures/Manuals/Operating Policies	5
7	Charter Operations - Types and Evaluation Techniques	3
8	OMB Circular A-126	3
	<b>TOTAL</b>	<b>34</b>

Recurrent Training Curriculum Table VI-1.1

<b>MODULE</b>	<b>SUBJECT</b>	<b>TRAINING</b>
1	Changes/Updates Applicable to DOE Policy/Orders/Regulations/Reporting Requirements	4
2	Changes/updates in Non-DOE Regulations (Title 14 C FR, Title 49 CFR, Title 41 part 102-33, Federal Travel Regulations, OMB Circulars, etc)	1
3	Accident Prevention Review or Safety Management or Human Factors	1
4	Previous Year Lessons-Learned	1
5	To Be Determined (alternate training subjects annually)	4
	<b>TOTAL</b>	<b>11</b>

- (d) **Re-qualification Training:** This category of training is for personnel who have been trained and qualified by DOE, but have become unqualified to serve in a particular duty position due to not receiving recurrent training or a competency test within an 18 month period. The re-qualification training curriculum is identical to the initial assignment training.
- (e) **Record Keeping:** Record keeping is an integral part of training. Without adequately documented records, auditors may question whether the training or qualification ever took place. It is imperative that DOE Aviation Managers and Safety Officers:
- (i) Have on file a Technical Qualification Record (TQR) signed by a person who is qualified under the AvM/APM or ASO Functional Qualification Standard at the “expert” level.
  - (ii) Forward a copy of the TQRs to the OAM for review and tracking.
  - (iii) Maintain well-organized training records per local record keeping management and storage requirements.

#### 4. Applicable Standards

Classification Act of 1949, which has been codified in Chapter 51 of Title 5, United States Code

DOE O 360.1B, Federal Employee Training

DOE P 426.1, Federal Technical Capability for Defense Nuclear Facilities

DOE M 426.1-1, Federal Technical Capability Manual

DOE O 440.2B, Aviation Management and Safety

DNFSB Approved Functional Qualification Standards for Aviation Managers and Aviation Safety Officers

**5. Supplemental Guidance**

Energy On-Line Learning Center (OLC<sup>2</sup>) Training for Aviation Managers and Safety

Energy OLC<sup>2</sup> OMB Circular A-126 Training for Aviation Managers and Safety

Officers

Chapter V and VII, DOE G 440.2B-2A



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## CHAPTER VII. FLIGHT CREWMEMBER, CREWMEMBER, QUALIFIED NON-CREWMEMBER AND MAINTENANCE TECHNICIAN TRAINING PROGRAMS

1. **Purpose:** The purpose of this section is to ensure qualification standardization, and to enhance the safety of aviation operations by ensuring the personnel are competent commensurate with their assigned duties through the appropriate training of flight, mission, and maintenance personnel.
2. **Applicability:** This section is applicable to all DOE/NNSA elements, including contractors at each site that oversee, manage or operate DOE-Federal aircraft.
3. **General:** This section sets forth minimum recommendations for establishment and maintenance of training programs for flight crewmembers, crewmembers, qualified non-crewmembers, and maintenance technicians who operate, perform duties during missions, and maintain DOE-Federal manned and unmanned aircraft. Personnel should not serve as a flight crewmember, crewmember, qualified non-crewmember, or perform maintenance on DOE-Federal manned and unmanned aircraft unless he/she has completed the appropriate initial or recurrent training phase appropriate to the position they are assigned and is current and proficient. There are six basic categories of training applicable to flight crewmembers and crewmembers and there are three basic categories of training for qualified non-crewmembers and maintenance technicians. The appropriate category of training is determined by the individual's previous experience and duty position.
4. **Categories of Training Flight Crewmembers and Crewmembers**
  - (a) **Initial Training:** The training required for flight crewmembers that have not qualified and served in the same capacity on an aircraft.
  - (b) **Transition Training:** The training required for flight crewmembers that have qualified and served in the same capacity on another aircraft.
  - (c) **Upgrade Training:** The training required for crewmembers that have qualified and served as second-in-command or other duties on a particular aircraft type, before they serve as pilot-in-command or other crewmember duties on that aircraft.
  - (d) **Differences Training:** The training required for flight crewmembers that have qualified and served on a particular type aircraft, when the Aviation Program Manager or Safety Officer finds differences training is necessary before a crewmember serves in the same capacity on a particular variation of that aircraft.
  - (e) **Recurrent Training:** The training required for flight crewmembers to remain trained in each aircraft, crewmember position, and type of operation in which the crewmember serves.

- (f) Flight Proficiency Training: The number of maneuvers, procedures, or functions that must be conducted in the aircraft to maintain mission proficiency within a specified time.

## **5. Categories of Training Qualified Non-crewmembers and Maintenance Technicians**

- (a) Initial Training: The training required for maintenance technicians or qualified non-crewmembers who have been recently hired or not served in the same capacity within the maintenance or flight organization.
- (b) Differences Training: The training required for maintenance personnel or qualified non-crewmembers who have qualified and performed maintenance or performed mission duties on a particular type aircraft, when the AvM/APM, ASO or Director of Maintenance finds differences training is necessary before performing maintenance or conducting mission duties on a particular variation of that aircraft or a different type of aircraft. Refer to Chapter VII, paragraph 7.
- (c) Recurrent Training: The training required for maintenance personnel or qualified non-crewmembers to remain adequately trained and currently proficient in the processes, procedures, and equipment necessary to maintain and inspect each aircraft or perform mission duties while on board an aircraft.

## **6. Training Program (Initial Training)**

- (a) General
  - (1) Each DOE/NNSA element should establish or ensure a written training program is developed, the program should:
    - (i) Ensure that each flight crewmember, flight instructor, check airman, maintenance technician, qualified non-crewmember, and each person assigned duties for the carriage and handling of hazardous materials (as defined in 49 CFR 171.8) is adequately trained to perform their assigned duties.
    - (ii) Describe the ground and flight training facilities and/or where the organization obtains the facilities, including the process used to ensure the adequacy of the facilities.
    - (iii) Establish qualifications for the ground instructors used for the training.
    - (iv) Provide and keep current for each aircraft type used and, if applicable, the particular variations within the aircraft type, appropriate training material, examinations, forms, instructions, and procedures for use in conducting the training and checks recommended in this guide.

- (v) Describe the number of flight instructors, check airmen, maintenance instructors and simulator instructors used to conduct the flight training, flight checks, ground and maintenance training, simulator training courses or identify what organization provides the flight instructors, check airmen, maintenance instructors and simulator instructors recommended by the guide.
- (2) Identify each instructor, supervisor, or check airman who is responsible for a particular ground-training subject, segment of flight training, course of training, flight check, or competence check under the organization's program:
- (i) Should certify as to the proficiency and knowledge of the flight crewmember, crewmember, qualified non-crewmember, flight instructor, check airman, or maintenance technician concerned upon completion of that training or check. That certification should be made a part of the flight crewmember's, crewmember's, qualified non-crewmember's, or maintenance technician's record.
  - (ii) When the certification recommended by this paragraph is made by an entry in a computerized record keeping system, the certifying instructor, supervisor, or check airman, must be identified with that entry. However, the signature of the certifying instructor, supervisor, or check airman is not required for computerized entries.
  - (iii) Identify all proficiency checks and knowledge tests that should be performance based using a measurable scale to determine the flight crewmember's, crewmember's, qualified non-crewmember's or maintenance technician's mastery of the subject or task.
  - (iv) Identify training subjects that apply to more than one aircraft or flight crewmember, crewmember, qualified non-crewmember or maintenance position and that have been satisfactorily completed and identify previous training while employed by the organization for another aircraft or another flight crewmember, crewmember, qualified non-crewmember or maintenance position. That training need not be repeated during subsequent training other than recurrent training.
- (3) Identify aircraft simulators and other training devices that may be used in the organization's training program, if approved by the FAA. Simulators or other training devices used for qualified non-crewmember training are not required to be FAA approved.

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- (4) Ensure whenever a flight crewmember, crewmember, qualified non-crewmember or maintenance technician, who is required to take training under the organization's program, completes the training during the month or in the calendar month before, or after in which that training is required, the flight crewmember, crewmember, qualified non-crewmember or maintenance technician is considered to have completed it in the calendar month in which it was required.
- (b) Training Program Curriculum
- (1) Each organization should prepare and keep current a written training program curriculum for each type of aircraft, mission profile, or maintenance function for each flight crewmember, crewmember, qualified non-crewmember, and maintenance technician required for that type aircraft or maintenance program.
  - (2) The curriculum should include ground and flight training for flight crewmembers, crewmembers, qualified non-crewmembers, if applicable and the maintenance training recommended by this guide in VII 6 and 7.
  - (3) Each training program curriculum should include the following:
    - (i) A list of principal ground training subjects, including emergency training subjects and learning objectives that are to be accomplished.
    - (ii) A list of all time training devices, mockups, systems trainers, procedures trainers, or other training aids that the organization will use.
    - (iii) For flight crewmembers, detailed descriptions and/or pictorial displays of the approved normal, abnormal, and emergency maneuvers, procedures, and functions that will be performed during each flight training phase or flight check, indicating those maneuvers, procedures and functions that are to be performed during the in flight portions of flight training and flight checks.
    - (iv) For crewmembers or qualified non-crewmembers, detailed descriptions and/or pictorial displays of the approved normal, abnormal, emergency procedures and functions that will be performed by crewmembers or qualified non-crewmembers during each flight phase and flight check.
    - (v) For maintenance technicians, detailed descriptions or pictorial displays of the approved maintenance processes, procedures, and special inspection procedures, if any. If the maintenance technician acts in a capacity onboard the aircraft, then the normal, abnormal,



emergency maneuvers, procedures and functions they would be expected to perform.

(c) Flight Crewmember Training Requirements

(1) Each organization should include in its training program the following initial, recurrent and transition ground training as appropriate to the particular assignment of the flight crewmember:

(i) Basic indoctrination ground training for newly hired flight crewmembers including instruction, in at least the:

- 1 duties and responsibilities of flight crewmembers as applicable;
- 2 appropriate provisions of DOE O 440.2B, applicable DOE and NNSA policies, and applicable parts and sections of 14 CFR Chapter 1; and
- 3 contents of the organizations aviation implementation plan operations manual or procedures manual.

(ii) The initial, upgrade, recurrent and transition ground training should include, but is not limited to:

- 1 General subjects:
  - A. The organization's flight locating procedures;
  - B. Principles and methods for determining weight and balance, and runway limitations for takeoff and landing, if applicable;
  - C. Enough meteorology to ensure a practical knowledge of weather phenomena, including the principles of frontal systems, icing, fog, thunderstorms, wind shear and, if appropriate, high altitude weather situations;
  - D. Air traffic control systems, procedures, and phraseology;
  - E. Navigation and the use of navigational aids, including instrument approach procedures;
  - F. Normal and emergency communication procedures;

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- G. Visual cues before and during descent below DH or MBA;
  - H. Crew resource management initial training;
  - I. Human factors; and
  - J. Other instructions as necessary to ensure competence.
- 2 For each aircraft type:
- A. General description;
  - B. Performance characteristics;
  - C. Engines and propellers;
  - D. Major components; and
  - E. Major aircraft systems (i.e., flight controls, electrical, and hydraulic), other systems, as appropriate, principles of normal, abnormal, emergency operations, appropriate procedures and limitations.
- 3 Knowledge and procedures for:
- A. Recognizing and avoiding severe weather situations;
  - B. Escaping from severe weather situations, in case of inadvertent encounters, including low-altitude wind shear (except that rotorcraft pilots and Tier VI and V unmanned aircraft systems are not required to be trained in escaping from low-altitude wind shear);
  - C. Operating in or near thunderstorms (including best penetrating altitudes), turbulent air (including clear air turbulence), icing hail, and other potentially hazardous meteorological conditions; and
  - D. Operating aircraft during ground icing conditions, (i.e., any time conditions are such that frost, ice, or snow may reasonably be expected to adhere to the aircraft), if the organization expects to authorize takeoffs in ground icing conditions, including:

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- (i) The use of holdover times when using deicing/anti-icing fluids;
  - (ii) Aircraft deicing/anti-icing procedures, including inspection and check procedures and responsibilities;
  - (iii) Communications;
  - (iv) Aircraft surface contamination (i.e., adherence of frost, ice, or snow) and critical area identification, and knowledge of how contamination adversely affects airplane performance and flight characteristics;
  - (v) Types and characteristics of deicing/anti-icing fluids, if used by the organization;
  - (vi) Cold weather preflight inspection procedures;
  - (vii) Techniques for recognizing contamination on the aircraft;
  - (viii) Operating limitations;
  - (ix) Fuel consumption and cruise control;
  - (x) Flight planning;
  - (xi) Each normal and emergency procedure; and
  - (xii) The approved aircraft or rotorcraft flight manual or equivalent.
- (2) Emergency Training
- (i) Each training program must provide emergency training for each aircraft type, model, and configuration, each crewmember, and each kind of operation conducted, as appropriate for each crewmember and the organization's mission.
  - (ii) Emergency training should provide the following:
    - 1 Instruction in emergency assignments and procedures, including coordination among crewmembers;

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- 2 Individual instruction in the location, function, and operation of emergency equipment including:
    - A. Equipment used in ditching and evacuation;
    - B. First aid equipment and its proper use; and
    - C. Portable fire extinguishers, with emphasis on time type of extinguisher to be used on different classes of fires.
  
  - 3 Instruction in the handling of emergencies including:
    - A. Rapid decompression;
    - B. Fire in flight or on the surface and smoke control procedures with emphasis on electrical equipment and related circuit breakers found in cabin areas;
    - C. Ditching and evacuation;
    - D. Illness, injury, or other abnormal situations involving passengers, crewmembers or qualified non-crewmembers; and
    - E. Hijacking and other unusual situations.
  
  - 4 Review of the organization's or other DOE previous aircraft accidents and incidents involving actual emergencies.
  
  - 5 Performance by each crewmember of at least the following emergency drills, using the proper emergency equipment and procedures, unless the organization finds that, for a particular drill, the crewmember can be adequately trained by demonstration:
    - A. Ditching, if applicable;
    - B. Emergency evacuation;
    - C. Fire extinguishing and smoke control;
    - D. Operation and use of emergency exits, including deployment and use of evacuation chutes, if applicable;
    - E. Use of crew and passenger oxygen;

- F. Removal of life rafts from the aircraft, inflation of the life rafts, use of life lines, and boarding of passengers and crew, if applicable; and
  - G. Donning and inflation of life vests and the use of other individual flotation devices, if applicable.
- (3) Instruction to crewmembers who serve in operations above 25,000 feet in the following:
- (i) Respiration;
  - (ii) Hypoxia;
  - (iii) Duration of consciousness without supplemental oxygen at altitude;
  - (iv) Gas expansion;
  - (v) Gas bubble formation; and
  - (vi) Physical phenomena and incidents of decompression.
- (4) Emergency and Emergency Evacuation Duties
- (i) Each Field element should, for each type and model of aircraft, assign to each category of crewmember, as appropriate, the necessary functions to be performed in an emergency or a situation requiring emergency evacuation. The Field element should show those functions are realistic, can be practically accomplished, and will meet any reasonably anticipated emergency, including the possible incapacitation of individual crewmembers or their inability to reach the crewmember cabin because of shifting cargo or mission equipment.
  - (ii) The Field element should describe in its aviation implementation plan, operations manual or procedures manual, or other ruling document, the functions of each category of required crewmembers.
- (5) Demonstration of Emergency Evacuation Procedures
- (i) Each Field element should show, by actual demonstration, that the emergency evacuation procedures for each type and model of aircraft that is used in law enforcement, security missions, or research and development operations, allow the evacuation of the

full seating capacity, in 90 seconds or less, in each of the following circumstances:

- 1 A demonstration should be conducted by the Field element upon the initial introduction of a type and model of aircraft applicable to this section. However, the demonstration need not be repeated for any aircraft type or model that has the same number and type of exits, the same cabin configuration, and the same emergency equipment as any other aircraft used by the Field element in successfully demonstrating emergency evacuation in compliance with this paragraph.
  - 2 A demonstration should be conducted:
    - A. Upon increasing by more than 5 percent the crewmember seating capacity for which successful demonstration has been conducted; or
    - B. Upon a major change in the crewmember cabin interior configuration that will affect the emergency evacuation of crewmembers.
  - 3 If a Field element has conducted a successful demonstration required by 14 CFR Part 121, Section 121.291(a) in the same type aircraft as a Part 121, or Part 125 certificate holder, it need not conduct a demonstration under this paragraph in that type aircraft.
  - 4 When operating or proposing to operate one or more landplanes in extended over water operations, or otherwise required to have certain equipment under Chapter VIII of the Guide, should show, by a simulated ditching that it has the ability to efficiently carry out its ditching procedures.
  - 5 If a Field element has conducted a successful demonstration required by 14 CFR Part 121, Section 121.291(b) in the same type aircraft as Part 121, or Part 125 certificate holder, it need not conduct a demonstration under this paragraph in that type aircraft.
- (d) Each training program should provide the initial, upgrade, recurrent, transition flight, and proficiency training, as applicable in the following maneuvers:
- (1) Airplanes (Manned and Unmanned Aircraft):
    - (i) Takeoffs and landings (normal, crosswind, short and soft-field);

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- (ii) Rejected Take-offs;
  - (iii) Go-around;
  - (iv) Maneuvering during slow flight;
  - (v) Stalls;
  - (vi) Constant altitude turns;
  - (vii) Simulated forced landings and other emergency operations;
  - (viii) Flight by reference to instruments (For Unmanned aircraft by reference to control console or operating platform);
  - (ix) Simulated engine-out procedures and performance; and
  - (x) Mission profile and maneuvers
- (2) Rotorcraft-Helicopters (Manned and Unmanned Aircraft):
- (i) Normal takeoffs and landings to a hover and to the ground;
  - (ii) Rejected Take-offs;
  - (iii) Confined area operations;
  - (iv) Maximum performance takeoffs;
  - (v) Pinnacle operations;
  - (vi) Slope operations;
  - (vii) Quick stops;
  - (viii) Running landings;
  - (ix) Authoritative approaches from altitude (manned only);
  - (x) Hovering autorotation (manned only);
  - (xi) Forced landings;
  - (xii) Settling with power (demonstration);
  - (xiii) Loss of tail rotor effectiveness;
  - (xiv) System failures, e.g., anti-ice, hydraulics, electrical, communications link, etc.; and

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- (xv) Mission profile and maneuvers
  - (3) Instrument flight (manned aircraft, if applicable, and unmanned aircraft, if operating within the National Airspace System above 18,000 MSL or under Instrument Meteorological Conditions):
    - (i) Instrument cockpit check or unmanned aircraft control console;
    - (ii) Intercepting/tracking VOR/NDB (manned aircraft only);
    - (iii) Intercepting/tracking GPS;
    - (iv) Steep turns;
    - (v) Recovery from unusual attitudes;
    - (vi) Basic attitude instrument flying;
    - (vii) VOR approach (manned aircraft only);
    - (viii) ILS Front course approach;
    - (ix) ILS Back course approach;
    - (x) Holding procedures;
    - (xi) Missed approach procedures;
    - (xii) Circling approach procedures;
    - (xiii) Simulated engine-out; and
    - (xiv) ATC Phraseology, reports, and other areas

**7. Differences Training:** The DOE/NNSA element should establish or ensure the differences training includes for each aircraft type (manned and unmanned aircraft):

- (a) A general description;
- (b) Performance characteristics;
- (c) Engines and propellers;
- (d) Major components;
- (e) Major airplane systems (i.e., flight controls, electrical, hydraulic); other systems as appropriate; principles of normal, abnormal, and emergency operations; appropriate procedures and limitations;



- (f) Procedures for:
  - (1) Recognizing and avoiding severe weather situations;
  - (2) Escaping from severe weather situations, in case of inadvertent encounters, including low-altitude wind shear; and
  - (3) Operating in or near thunderstorms (including best penetrating altitudes), turbulent air (including clear air turbulence), icing, hail, and other potentially hazardous meteorological conditions.
- (g) Operating limitations;
- (h) Fuel consumption and cruise control;
- (i) Flight planning;
- (j) Each normal and emergency procedure; and
- (k) The approved airplane or rotorcraft flight manual.

## **8. Initial and Recurrent Training Maintenance Personnel**

- (a) Maintenance Technician Initial Training Programs
  - (1) Each person performing maintenance, inspection, preventive maintenance or alteration on a DOE-Federal aircraft, propeller, power plant, appliance, system or accessory shall be trained and qualified in the manufacturer's or supplemental type certificate holder's methods, techniques, and practices prescribed in the current manufacturer's maintenance manual or instructions for continued airworthiness, and the practices and techniques acceptable to the FAA.
  - (2) The initial training should include, but is not limited to, the following:
    - (i) The operation of the test equipment, special tools, or other equipment required to maintain or test an aircraft, propeller, power plant, appliance, system or accessory.
    - (ii) The procedures and requirements for conducting any tests as described in the manufacturer's or Supplemental Type Certificate holders methods, techniques, and practices prescribed in the current manufacturer's maintenance manual, or instructions for continued airworthiness.

- (iii) Maintenance record keeping, recording of maintenance, including the organizations forms and information systems.
- (b) Recurrent and Proficiency Training:
  - (1) Each organization should ensure that each maintenance technician receives recurrent training and is adequately trained and currently proficient for the type aircraft and inspection procedures that the maintenance technician is involved.
  - (2) Each organization should ensure the recurrent training for maintenance technicians should include at least a quiz or other review to determine the maintenance technician's knowledge of the aircraft and inspection procedures that the maintenance technician is involved.

**9. Initial and Recurrent Training Qualified Non-crewmembers (Observers, Mission Scientist, Escorts, etc.)**

- (a) Qualified Non-crewmember Training Program
  - (1) General subjects:
    - (i) The authority of the pilot-in-command;
    - (ii) Personnel handling, including procedures to be followed in handling deranged persons or other persons whose conduct might jeopardize safety;
    - (iii) in-flight duties and responsibilities; and
    - (iv) DOE and the Field element's policies, pertinent Federal regulations, and the organization's flight and safety procedures.
  - (2) For each aircraft type:
    - (i) A general description of the aircraft emphasizing physical characteristics that may have a bearing on ditching, evacuation, and in flight emergency procedures and on other related duties;
    - (ii) The use of both the intercommunication or public address system and the means of communicating with flight crewmembers, including emergency means in the case of attempted hijacking or other unusual situations; and
    - (iii) Proper use of electrical equipment, mission equipment and the controls for cabin heat and ventilation.

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- (iv) Emergency training to include: emergency training for each aircraft type, model, and configuration, each crewmember, and each kind of operation conducted, as appropriate for each crewmember and the Field element's mission.
  - (v) Emergency training should provide the following:
    - 1 Instruction in emergency assignments and procedures, including coordination among crewmembers.
    - 2 Individual instruction in the location, function, and operation of emergency equipment including:
      - A. Equipment used in ditching and evacuation;
      - B. First aid equipment and its proper use; and
      - C. Portable fire extinguishers, with emphasis on the type of extinguisher to be used on different classes of fires.
  - (vi) Instruction in the handling of emergencies including:
    - 1 Rapid decompression;
    - 2 Fire in flight or on the surface and smoke control procedures with emphasis on electrical equipment and related circuit breakers found in cabin areas;
    - 3 Ditching and evacuation;
    - 4 Illness, injury, or other abnormal situations involving passengers, crewmembers or qualified non-crewmembers;
    - 5 Hijacking and other unusual situations; and
    - 6 Review of the organization's or other DOE previous aircraft accidents and incidents involving actual emergencies.
  - (vii) Each crewmember and qualified non-crewmember should perform at least the following emergency drills, using the proper emergency equipment and procedures, unless the organization finds that, for a particular drill, the crewmember or qualified non-crewmember can be adequately trained by demonstration:
    - 1 Ditching, if applicable.

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- 2 Emergency evacuation.
  - 3 Fire extinguishing and smoke control.
  - 4 Operation and use of emergency exits, including deployment and use of evacuation chutes, if applicable.
  - 5 Use of crew and passenger oxygen.
  - 6 Removal of life rafts from the aircraft, inflation of the life rafts, use of life lines, and boarding of passengers and crew, if applicable.
  - 7 Donning and inflation of life vests and the use of other individual flotation devices, if applicable.
- (b) Qualified non-crewmembers who serve in operations above 25,000 feet must receive instruction in the following:
- (1) Respiration.
  - (2) Hypoxia.
  - (3) Duration of consciousness without supplemental oxygen at altitude.
  - (4) Gas expansion.
  - (5) Gas bubble formation.
  - (6) Physical phenomena and incidents of decompression.
- (c) Recurrent Training: Each organization should ensure that each qualified non-crewmember receives recurrent training and is adequately trained and currently proficient for the type aircraft and crewmember position involved.
- (1) Recurrent ground training for qualified non-crewmembers must include at least the following:
    - (i) A quiz or other review to determine the crewmember's knowledge of the aircraft and qualified non-crewmember position involved, and
    - (ii) Emergency procedures.

- 10. Establishing Proficiency Events:** The purpose of this paragraph is to establish guidelines to the Field element for establishing pilot, maintenance technician, and qualified non-crewmember proficiency events to meet the requirement in DOE O 440.2B. DOE recognizes that in many cases DOE's diverse flying programs provide for limited

monthly or annual flying hours for each crewmember or maintenance technician to maintain a satisfactory level of proficiency. Using information gathered from other Federal agencies, Department of Defense, NTSB accident causal factors, and the civil industry regarding crewmember and maintenance technician proficiency, it was determined a need exists, above that established in Title 14 CFR Parts 61, 91, 121 and 135, to establish proficiency events to enhance the safety and effectiveness of operations.

(a) Flight Crewmembers

(1) Each Field element should evaluate the types of flight operations necessary to perform the aircraft's mission profile, such as low altitude radiological survey, power line patrol, Night Vision Goggle operations, etc., to determine the types of events that the pilot executes to conduct the mission. Identify the key maneuvers involved and establish a baseline number to be completed within the preceding 30, 45, 90, 180 days or annually to document the pilot's proficiency. As an example, the Aviation Manager or Chief Pilot involved with power line patrols could:

(i) Identify the maneuvers involved with a power line patrol in mountainous terrain, such as:

- 1 Hovering near an obstacle;
- 2 Approach to an out-of-ground hover;
- 3 Turns transition from up-wind to down-wind;
- 4 Steep approach;
- 5 Confined area take-off, normal;
- 6 High-altitude (above 5000 feet MSL) confined area take-off;
- 7 Slow flight (down-wind); and
- 8 Snow field operations.

within (ii) Then establish a baseline proficiency for each key maneuver the previous 30, 45, 90, 180 days, or annually.

(2) Recording Events

(i) At the end of each flight, the pilot should enter the number of events completed for that day's mission. This will ensure the pilot has a record of his/her proficiency.

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- (ii) If the pilot fails to maintain proficiency then the Field element's check pilot or chief pilot can conduct a training flight with the pilot to evaluate the pilot's proficiency in the identified maneuvers and recommend the pilot for further training or release him/her for operations.
  - (b) Maintenance Technicians
    - (1) Each Field element should evaluate the types of maintenance activities performed by the organization (component overhaul, flight control rigging, weighing of aircraft, sheet metal repairs, etc.) to determine the types of events that a maintenance technician should perform to stay proficient. It is not the expectation of DOE to have every single maintenance activity performed and identified (i.e., proper technique in using a torque wrench, removing screws, etc.) the process is focused on the larger tasks such as disassembly of main gearbox, inspection of main gearbox, removal and installation of flight controls, etc. Once the major proficiency events are identified, establish a baseline number to be completed within a specified time such as six months, annually, or whatever time period the Field element determines.
  - (c) Qualified Non-crewmembers
    - (1) Each Field element should evaluate the types of activities under their control and performed by the organization to determine the types of events that a qualified non-crewmember should perform to stay proficient. It is not the expectation of DOE to have every single qualified non-crewmember activity performed and identified when the process is focused on the larger tasks such as those specific to the type of mission work performed. Once the major proficiency events are identified, establish a baseline number to be completed within a specified time such as six months, annually, or whatever time period the Field element determines
- 11. Discussion:** Many of the suggested training elements in this Chapter are required when operating under a 14 CFR part 121 or 135 Air Carrier certificate, but each Field element should evaluate their mission and operating environment to determine if other training may be required. A properly trained workforce is essential to maintaining safe and effective operations.
- 12. Applicable Standards**
- Title 14 CFR Part 61.56; 61.57; 61.58; 61.65; 61.67; 61.68; 61.127; and 61.157
- Title 14 CFR Parts 43.3, 65.81 and 65.83
- Title 14 CFR Part 135. 293 through 135.351

Title 14 CFR Part 121.400 through 121.465

DOE O 360.1B, Federal Employee Training

DOE P 426.1, Federal Technical Capability for Defense Nuclear Facilities

DOE M 426.1-1, Federal Technical Capability Manual

DOE O 440.2B, Aviation Management and Safety

**13. Supplemental Guidance**

Chapter V, VI and VII, DOE O 440.2B-2A

FAA Advisory Circular (AC) 120-46A Use of Airplane Flight Training Devices (In flight Training and Checking for Airman Qualification and Certification)

FAA AC 120-45A Airplane Flight Training Device Qualification

FAA Advisory Circular (AC) 120-51D Crew Resource Management Training

FAA AC 120-61 Crewmember Training on In-flight Radiation Exposure

FAA AC 120-62 Takeoff Safety Training Aid Announcement of Availability

FAA AC 120-63 Helicopter Simulator Qualification

FAA AC 120-6813 Pilot Records Improvement Act of 1996, as Amended

FAA AC 120-50 Guidelines for Operational Approval of Wind shear Training Programs

FAA AC 120-72 Maintenance Resource Management Training

FAA AC 121-32 Dispatch Resource Management Training





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## CHAPTER VIII. AIRCRAFT AND EQUIPMENT

1. **Purpose:** The purpose of this Chapter is to state the basic minimum certification requirements for manned and unmanned aircraft, engines, propellers, appliances and mission equipment so that program planning efforts, procedures, and evaluations support the effectiveness and safety of the aviation program.
2. **Applicability:** This Chapter is applicable to all DOE/NNSA elements overseeing, managing, or operating DOE-Federal aircraft or commercial aviation services and contains other airworthiness standards acceptable for Departmental aviation services. Other Government agency aircraft, including those of the Department of Defense (DoD) that are not under DOE operational control, are not required to meet these standards.
3. **General Information:** In accordance with 14 CFR part 21, Certification Procedures for Products and Parts, section 21.181(a) Duration, states, “(a) Unless sooner surrendered, suspended, revoked, or a termination date is otherwise established by the Administrator, airworthiness certificates are effective as follows: (1) Standard airworthiness certificates, special airworthiness certificates—primary category, and airworthiness certificates issued for restricted or limited category aircraft are effective as long as the maintenance, preventive maintenance, and alterations are performed in accordance with Parts 43 and 91 of this chapter and the aircraft are registered in the United States.” All current DOE owned aircraft have been issued “Standard” or “Special” airworthiness certificates therefore, it is the position of the DOE to maintain civil aircraft standards for DOE-Federal aircraft. In addition, on occasion DOE-Federal aircraft fly personnel for other than mission travel purposes; because of these operations, the aircraft must meet the civil airworthiness standards for certification of aircraft. This includes the aircraft’s engines and propellers, as well as the aircraft as a whole. A civil aircraft must have a current Certificate of Airworthiness (C of A) issued by the FAA to operate in the National Airspace System. DOE also conducts unmanned aircraft (UA) operations from small micro-unmanned aircraft to large unmanned aircraft. UA pose a challenge to meeting the same regulations as those of manned aircraft, nevertheless, the FAA has ruled that UA are aircraft and subject to FAA oversight and regulations. This Chapter is broken down into two separate areas manned and unmanned aircraft.
4. **Definitions:**
  - (a) Aircraft –A device that is used or intended to be used for flight in the air [14 CFR part 1, Definitions].
  - (b) Tier I UAS- A powered unmanned aircraft with a gross weight above 12,500 pounds.
  - (c) Tier II UAS- A powered unmanned aircraft; that has a gross weight above 500 pounds but not over 12,500 pounds.

- (d) Tier III UAS- A powered unmanned aircraft that has a gross weight above 250 but no over 500 pounds with a less than \$100,000 in acquisition costs.
- (e) Tier IV UAS. A powered unmanned aircraft that has a gross weight above 50 but not over 250 pounds with less than \$100,000 in acquisition costs.
- (f) Tier V UAS- A powered unmanned aircraft that has a gross weight of .1 pound but under 50 pounds with less than \$100,000 in acquisition costs.
- (g) Unmanned Aircraft (UA) – a device that is used or intended to be used for flight in the air that has no onboard pilot. This includes all classes of airplanes, helicopters, airships, and translational lift aircraft that have no onboard pilot.
- (h) Unmanned Aircraft System (UAS) - For the Department of Energy, a UAS is a powered unmanned aircraft, launching device (if any), ground and flight control systems; that is not used for sport or hobby, but for commercial or public purposes to conduct aerial research, aerial photography, aerial survey, or research and development of platforms, sensors, cameras, or other such devices that are operated in the National Airspace System or within DOE or NNSA Restricted Airspace.

**5. Registration and Certificate of Airworthiness [14 CFR part 47].** All DOE manned aircraft must meet the following requirements:

- (a) The aircraft must have an effective U.S. registration certificate on board during all operations as required by 14 CFR Chapter 1, Section 91.203.
- (b) An appropriate and current airworthiness certificate must be displayed in accordance with 14 CFR Chapter 1, Section 91.203(c). Note: The C of A is effective as long as the maintenance, preventative maintenance, and alterations are performed in accordance with 14 CFR Chapter 1, Parts 21, 43, and 91, as appropriate, and the aircraft is registered in the United States.
- (c) The aircraft must have been inspected in accordance with 14 CFR part 91.409 within the preceding 12-calendar months.
  - (1) If a Field element plans to use a progressive inspection program, it must submit a written request to the FAA. The request must be sent to the Flight Standards District Office (FSDO) having jurisdiction over the area in which the applicant is located and the applicant must be able to meet the requirements identified in 14 CFR part 91.409(d).
  - (2) Large airplanes, turbojet multiengine airplanes, turbo propeller-powered multiengine airplanes, and turbine-powered rotorcraft must have a program approved that meets the requirements of 14 CFR part §91.409(e).

- (3) All maintenance and required inspections must have been completed by a person authorized under 14 CFR part §43.3 and §43.7. Additionally, the maintenance and inspections performed must be recorded in accordance with 14 CFR part §43.9 and §43.11. 14 CFR Part 43 prescribes the rules governing the maintenance, preventative maintenance, rebuilding, and alteration of civil U.S. registered aircraft.
- (d) Any alterations to the aircraft must have been accomplished and returned to service by an appropriately certified and authorized person under 14 CFR part 43 or under the provisions of parts 135 or 121.

## **6. Type Certification Manned Aircraft**

- (a) An application for a type certificate is made on a form and in a manner prescribed by the FAA Administrator and is submitted to the appropriate Aircraft Certification Office (ACO). The application for an aircraft type certificate must be accompanied by a three-view drawing of that aircraft and available preliminary basic data. An application for an aircraft engine type certificate must be accompanied by a description of the engine design features, the engine operating characteristics, and the proposed engine operating limitations. [14 CFR part 21.15]
- (b) Prior to airworthiness certification, the type design must be certificated by the FAA. Section 603(c) of the Federal Aviation Act of 1958 makes a type certificate a prerequisite for issuance of airworthiness certificates. Each Field element who wishes to determine the eligibility of an aircraft that has not been issued C of A must contact the responsible geographic Aircraft Certification Office (ACO) for assistance in seeking either:
  - (1) Design approval for aircraft that have been type certificated in the past; or
  - (2) type certification approval of aircraft that have been operated in the past under public aircraft status without a type certificate.
- (c) Aircraft Previously Type Certificated, if a DOE-Federal aircraft was originally built to an FAA type certificate, the Aircraft Certification Office will review the type certificate data and make a comparison with the aircraft's current design and condition. The applicant should provide the FAA Aircraft Certification Office with the technical information to assist in the following:
  - (1) A review of type design for any engineering changes or modifications;
  - (2) A review of replacement parts and technical data on the replacement parts;
  - (3) A review of applicable Airworthiness Directives (AD);
  - (4) A review of previous operating regimes; and

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- (5) If needed, application of later regulatory amendments or special conditions for any changes found necessary to establish current airworthiness standards for safe design.
- (d) The DOE Field element or applicant must provide the FAA accurate records of any changes from the approved type design that are necessary to establish the current design. The applicant should update all maintenance manuals as necessary. If there has been a substantial change in the type design, e.g., in the configuration, power, power limitations, speed limitations, or weight that have proven so extensive that a substantially complete investigation of compliance with the applicable regulations is required, DOE/NNSA will be required to apply for a new type certificate.
- 7. DOE-Federal Helicopters (Manned) Minimum Equipment:** Aviation accident reports and improvements in helicopter safety equipment have led to the realization that enhanced safety equipment should be installed on DOE-Federal helicopters. DOE-Federal helicopters may be used for operations that involve a significant degree of risk. These operations make it imperative that precautions be taken to preserve the health of employees, the public, and to prevent damage to property. The following equipment, if available and certified for the model in use, should be installed on DOE-Federal helicopters:
- (a) A wire strike protection system (for new purchases and leased aircraft);
  - (b) A crash resistant fuel system (for new purchases and leased aircraft);
  - (c) Shoulder restraints for each seat (for new purchases and leased aircraft);
  - (d) A cockpit voice recorder (if required by 14 CFR Part 135.151);
  - (e) A digital flight data recorder (if required by 14 CFR Part 135.152);
  - (f) Energy attenuating seats (new purchases); and
  - (g) At least one radar altimeter with aural and/or visual warning systems available to both pilots, if two pilots are used, and the helicopters are used for IFR, Night VFR, or Night Vision Goggle operations. This equipment is not suggested or expected to be installed in helicopters engaged in Day VFR operations only.
- 8. DOE-Federal Aircraft (Manned)**
- (a) Equipment Requirements, General: Except as provided in 14 CFR part 91.205, paragraphs (c)(3) and (e), no DOE owned or CAS vendor may operate or hire a powered manned aircraft with a standard category U.S. airworthiness certificate for day or night VFR, IFR, Flight at and above 24,000 feet MSL (FL 240), or Category II operations unless that aircraft contains the instruments and equipment specified in these paragraphs (or FAA-approved equivalents) for that type of

operation, and those instruments and items of equipment are in operable condition. The Field element should ensure aircraft operated or hired by the organization are equipped to meet:

- (1) 14 CFR part 91.205
- (2) The equipment required by Part 91.205, paragraph (d) if operating under Instrument Flight rules or Night Vision Goggle operations; and
- (3) For turbine-powered aircraft, any other equipment as the Field element may require.
- (4) Emergency Locators that meet 14 CFR part 91.207.
- (5) Aircraft Lights required by 14 CFR part 91.209
- (6) Supplemental Oxygen as required by 14 CFR part 91.211.
- (7) ATC transponders as required by 14 CFR part 91.215.
- (8) Data correspondence between automatically reported pressure altitude data and the pilot's altitude reference as required by 14 CFR part 91.217.
- (9) Altitude alerting system or device for turbojet-powered airplanes as required by 14 CFR part 91.219.
- (10) Any DOE or CAS vendor aircraft operating in any airspace within the Continental United States that has a traffic alert and collision avoidance system installed, that system must be FAA approved, on and operating during flight [14 CFR part 91.221]
- (11) A DOE owned or CAS turbine powered aircraft [14 CFR part 91.223] that has six or more passenger seats, excluding any pilot seat, must have an [FAA] approved terrain awareness and warning system that as a minimum meets the requirements for Class B equipment in Technical Standard Order (TSO)–C151, unless the aircraft is engaged in firefighting or aerial application operations. In addition, the Airplane Flight Manual shall contain appropriate procedures for:
  - (i) The use of the terrain awareness and warning system; and
  - (ii) Proper flight crew reaction in response to the terrain awareness and warning system audio and visual warnings.
- (12) At least one electric landing light that must be operational for night or over-the-top flight operations.

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- (13) Aural speed warning device, that is operational, for all transport category airplanes that complies with 14 CFR part 25.1303(c) (1).
  - (14) Materials for the interior compartments of aircraft in excess of 12,500 pounds must meet the requirements of 14 CFR part 91.613.
- (b) Small Aircraft, Crewmember Interphone Systems
- (1) The Field element should ensure that no person operates an aircraft having a crewmember-seating configuration, excluding any pilot seat, of less than nine unless it is equipped with:
    - (i) Operational crewmember intercommunication system including handsets, headsets, microphones, and selector switches; and
    - (ii) Is approved in accordance with Title 14 CFR Chapter 1, Section 21.305.
  - (2) The Field element should provide a means of two-way communication between the pilot compartment and:
    - (i) Each crewmember or qualified non-crewmember; and
    - (ii) Each station located on other than the main crewmember deck level.
- (c) Large Aircraft, Public Address and Crewmember Interphone Systems
- (1) The Field element should ensure that no person operates an aircraft having a crewmember-seating configuration, excluding any pilot seat, of more than 19 unless it is equipped with:
    - (i) A public address system which meets 14 CFR 121.318.
    - (ii) For transport category airplanes manufactured on or after November 27, 1990, meet the requirements of Title 14 CFR Chapter 1, Part 25, §25.1423.
  - (2) A crewmember interphone system which meets 14 CFR 121.319
    - (i) For Large Turbojet-powered Airplanes:
      - 1 Is accessible for use at enough flight attendant or crewmember stations so that all floor-level emergency exits (or entryway to those exits in the case of exits located within galleys) in each crewmember compartment are observable from one or more of those stations so equipped;

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- 2 Has an alerting system incorporating aural or visual signals for use by flight crewmembers to alert flight attendants and for use by flight attendants to alert flight crewmembers;
  - 3 For the alerting system required by paragraph (c)(2) of this section, has a means for the recipient of a call to determine whether it is a normal call or an emergency call; and
  - 4 When the airplane is on the ground, provides a means of two-way communication between ground personnel and either of at least two flight crewmembers in the pilot compartment. The interphone system station for use by ground personnel must be so located that personnel using the system may not avoid visible detection from within the airplane.
- (d) DOE owned Aircraft (manned)
- (1) The pilot in command of a DOE owned aircraft shall ensure that the following flying equipment and aeronautical charts and data, in current and appropriate form, are accessible for each flight at the pilot station of the aircraft:
    - (i) A flashlight having at least two size “D” cells, or the equivalent, that is in good working order, if conducting night or IFR operations.
    - (ii) A cockpit checklist containing the procedures required by paragraph (2) of this section.
    - (iii) Pertinent aeronautical charts, helicopters are not required to meet this recommendation when working day VFR within their normal areas of operation.
    - (iv) For IFR, VFR over-the-top, or night operations, each pertinent navigational en route, terminal area, and approach and letdown chart.
    - (v) In the case of multiengine airplanes, one-engine inoperative climb performance data.
  - (2) Each cockpit checklist must contain the following procedures and shall be used by the flight crewmembers:
    - (i) Before starting engines.
    - (ii) Before takeoff.

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- (iii) Cruise.
    - (iv) Before landing.
    - (v) After landing.
    - (vi) Stopping engines.
    - (vii) Emergencies.
  - (3) Each emergency cockpit checklist procedure required by paragraph (2) (vii) of this section must contain the following procedures, as appropriate:
    - (i) Emergency operation of fuel, hydraulic, electrical, and mechanical systems.
    - (ii) Emergency operation of instruments and controls.
    - (iii) Engine inoperative procedures.
    - (iv) Any other procedures necessary for safety.
  - (4) The equipment, charts, and data prescribed in this section shall be used by the pilot in command and other members of the flight crew, when pertinent.
- (e) Flight Navigator and Long-range Navigation Equipment [14 CFR 125.267]
- (1) No Field element should allow anyone to operate an aircraft outside the 48 conterminous States and the District of Columbia when its position cannot be reliably fixed for a period of more than one hour, without:
    - (i) A flight crewmember who holds a current flight navigator certificate; or
    - (ii) Two independent, properly functioning, and approved long-range means of navigation which enable a reliable determination to be made of the position of the aircraft by each pilot seated at that person's duty station.
    - (iii) Operations where a flight navigator or long-range navigation equipment, or both, are specified by the FAA in the operations specifications issued to an operator.
- (f) DOE-owned aircraft operated under a contractor's air carrier certificate.
- (1) The aircraft must conform to the operator's 14 CFR part 121 or 135 requirements.



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- (2) The aircraft must have the required equipment installed required by 14 CFR part 121 Subparts I, J, K, AA, and part 135 Subpart C.
- (g) Aviation Life Support Equipment [14 CFR 125.209]
- (1) Each Field element should require the carriage of all or any specific items of the equipment listed below for any over water operation:
- (i) A life preserver equipped with an approved survivor locator light, for each occupant of the airplane.
  - (ii) Enough life rafts (each equipped with an approved survivor locator light) of a rated capacity and buoyancy to accommodate the occupants of the airplane. Unless excess rafts of enough capacity are provided, the buoyancy and seating capacity beyond the rated capacity of the rafts must accommodate all occupants of the airplane in the event of a loss of one raft of the largest rated capacity.
  - (iii) At least one pyrotechnic signaling device for each life raft.
  - (iv) An FAA approved survival type emergency locator transmitter. Batteries used in this transmitter must be replaced (or recharged, if the battery is rechargeable) when the transmitter has been in use for more than one cumulative hour, or when 50 percent of their useful life (or for rechargeable batteries, 50 percent of their useful life of charge) has expired, as established by the transmitter manufacturer under its approval. The new expiration date for replacing (or recharging) the battery must be legibly marked on the outside of the transmitter. The battery useful life (or useful life of charge) requirements of this paragraph do not apply to batteries (such as water- activated batteries) that are essentially unaffected during probable storage intervals.
  - (v) The required life rafts, life preservers, and survival type emergency locator transmitter must be easily accessible in the event of a ditching without appreciable time for preparatory procedures. This equipment must be installed in conspicuously marked, approved locations.
  - (vi) A survival kit, appropriately equipped for the route to be flown, must be attached to each required life raft.
- (2) Field element should, require the carriage of all or any specific items of the equipment listed below for winter operation, if applicable:
- (i) Survival tent;

- (ii) Sleeping bag for each occupant;
- (iii) Enough rations to survive for a 48-hour period;
- (iv) Matches in a waterproof container;
- (v) Saw;
- (vi) Flare gun or flares;
- (vi) An FAA approved survival type emergency locator transmitter;  
and
- (vii) One pair of snow shoes, if required.

**9. DOE-owned unmanned Aircraft or CAS unmanned aircraft**

- (a) Registration and Certificate of Airworthiness [14 CFR parts 47 and 91]. All DOE-owned unmanned aircraft must:
  - (1) Must be registered in accordance with 14 CFR part 47.3, Aircraft Registration, however the Registration may be accessible to the pilot and/or displayed in the ground control station and not on the aircraft.
- (b) It is recommended that DOE UAs:
  - (1) Tier III, IV, and V unmanned aircraft should have a statement of airworthiness, including a statement the aircraft is safe for its intended operation, or have a current special airworthiness certificate in the experimental category.
  - (2) Tier I and II unmanned aircraft should hold an appropriate and current airworthiness certificate. Each U.S. airworthiness certificate used to comply with this subparagraph (except a special flight permit, a copy of the applicable operations specifications issued under 14 CFR part 21.197(c) or an authorization under §91.611) must have on it the registration number assigned to the aircraft under 14 CFR part 47. However, the airworthiness certificate need not have on it an assigned special identification number before 10 days after that number is first affixed to the aircraft. A revised airworthiness certificate having on it an assigned special identification number that has been affixed to an aircraft may only be obtained upon application to an FAA Flight Standards district office. The Certificate of Airworthiness must be displayed in accordance with 14 CFR Chapter 1, Section 91.203(b). Note: The C of A is effective as long as the maintenance, preventative maintenance, and alterations are performed in accordance with 14 CFR Chapter 1, Parts 21, 43, and 91, as appropriate, and the aircraft is registered in the United States.

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- (4) Unmanned aircraft should be inspected in accordance with the manufacturer's program and 14 CFR part 91.409 (a) (1) and (2) within the preceding 12-calendar months.
  - (5) Tier III, IV, and V unmanned aircraft, all maintenance and required inspections should have been completed by a person trained by the manufacturer. Additionally, the maintenance and inspections performed must be recorded in accordance with 14 CFR part 43.9 (a) (1) – (3) and 43.11
  - (6) Tier I and II unmanned aircraft, all maintenance and required inspections should be completed by a person authorized under 14 CFR part 43.3 and 43.7. Additionally, the maintenance and inspections performed must be recorded in accordance with 14 CFR part 43.9 and 43.11. 14 CFR Part 43 prescribes the rules governing the maintenance, preventative maintenance, rebuilding, and alteration of civil U.S. registered aircraft.
  - (7) Tier III, IV and V unmanned aircraft that have been altered from the original design, the alterations should be recorded and returned to service by a person knowledgeable or factory trained. In addition, the person must demonstrate through actual flight test that the alteration does not affect the air operability or safety of the intended operation.
  - (8) Tier I and II unmanned aircraft that have any alterations to the aircraft should have been accomplished and returned to service by an appropriately certified and authorized person under 14 CFR part 43.
- (b) Type Certification Unmanned Aircraft
- (1) An application for a type certificate is made on a form and in a manner prescribed by the FAA Administrator and is submitted to the appropriate Aircraft Certification Office (ACO). The application for an aircraft type certificate must be accompanied by a three-view drawing of that aircraft and available preliminary basic data. An application for an aircraft engine type certificate must be accompanied by a description of the engine design features, the engine operating characteristics, and the proposed engine operating limitations. [14 CFR part 21.15]
  - (2) A Field element owning or operating a Tier I or II unmanned aircraft for "public aircraft operations" must document that the aircraft, aircraft engine, or propeller concerned meets:
    - (i) The applicable parts of Department of Defense Handbook, MIL-HDBK-516B, Airworthiness Certification Criteria; or
    - (ii) For special classes of aircraft (Tier I and II UA), including the engines and propellers installed thereon, for which airworthiness

standards have not been issued under Title 14 CFR Chapter 1, Subchapter C, the applicable requirements will be the portions of those other airworthiness requirements contained in Parts 23, 25, 27, 29, 31, 33, and 35 found by the DOE or FAA Administrator to be appropriate for the aircraft and applicable to a specific type design, or such airworthiness criteria as the DOE or FAA Administrator may find provide an equivalent level of safety to those parts.

- (3) A Field element owning or operating a Tier III, IV or V unmanned aircraft for “public aircraft operations, a statement issued by the manufacturer or qualified DOE official that the aircraft is safe for its intended operation is adequate. The limitation placed on these aircraft is operation under day Visual Flight Rules [14 CFR Part 91] under 1000 feet above ground level in Class G Airspace or Restricted Airspace managed by DOE .
  - (4) A Field element owning or operating an unmanned aircraft for “civil aircraft operations” must comply with the applicable regulations in 14 CFR Chapter 1 and cannot be operated under a Certificate of Authorization.
- (c) Identification and Registration Markings:
- (1) Tier I and II unmanned aircraft must comply with Title 14 CFR part 45.
  - (2) Tier III, IV and V unmanned aircraft should seek a waiver from compliance with Title 14 CFR part 45.
- (d) Unmanned Aircraft Ground Control Stations (GCS). A GCS may be a laptop computer or a trailer where the control station is mounted that can seat up to three personnel. The essential requirements are that the GCS be evaluated with the UA as a total system in accordance with FAA standards such as RTCA Document 178B, 248B, or 278 or Department of Defense Handbook, MIL-HDBK-516B, Airworthiness Certification Criteria.
- (1) Personnel performing maintenance, preventative maintenance, software updates, or alterations to GCS must be qualified or trained by the manufacturer.

## 10. Applicable Standards:

Title 14 CFR Chapter 1, Subchapters C, D, E, F, and G

DOE O 440.2B, Aviation Management and Safety

DoD-HBK-516B, Airworthiness Certification Criteria

FAA Order 8130.34, Airworthiness Certification of Unmanned Aircraft Systems

FAA Interim Operational Approval Guidance 08-01, Unmanned Aircraft Systems

Operations in the U. S. National Airspace System

RTCA DO-178B, DO- 248B, and DO-278

Helicopter Association Aviation Safety Manual

Airman's Information Manual

## **11. Supplemental Guidance**

FAA Advisory Circular (AC) 00-1.1 Government Aircraft Operations

FAA AC 20-62D Eligibility, Quality, and Identification of Aeronautical Replacement Parts

FAA AC 20-96 Surplus Military Aircraft

FAA AC 20-132 Public Aircraft

FAA AC 20-142 Eligibility and Evaluation of U.S. Military Surplus Flight Safety Critical Aircraft Parts, Engines, and Propellers

FAA AC 21-13 Standard Airworthiness Certification of Surplus Military Aircraft and Aircraft Built from Spare and Surplus Parts

FAA AC 21-23A Airworthiness Certification of Civil Aircraft, Engines, Propellers, and Related Products Imported to the United States

FAA AC 21-29B Detecting and Reporting Suspected Unapproved Parts

FAA AC 21-40 Application Guide for Obtaining a Supplemental Type Certificate



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## CHAPTER IX. AIRCRAFT OPERATIONS

1. **Purpose:** The purpose of the Chapter is to standardize flight operations so that planning efforts, procedures, and evaluations support strict internal controls, safety, cost effective operations, compliance with laws, regulations, policies, and other requirements.
2. **Applicability:** This Chapter contains operational procedures and systems acceptable for Departmental aviation services (manned or unmanned) and Federal or other government agency aircraft, including those of the Department of Defense (DoD), that are operated to or from DOE owned or managed property under local agreement. The operation of other Government agency aircraft, including those of the DoD that are not in service or under DOE operational control or operating to or from DOE owned or managed property, is the responsibility of the respective agency.
3. **General Information:** The use of aircraft other than scheduled U.S. Flag Air Carriers or other Federal agency aircraft to include DoD is subject to the policies, rules, orders, and management controls of the Department. DOE owned aircraft (Federal aircraft) or Commercial Aviation Service providers (leased, chartered, contracted, or rented aircraft) solely for the use of the Department is designated a government aircraft. Government aircraft are subject to Departmental requirements.
4. **Approval Requirements for Government Aircraft**
  - (a) Field elements operating Government aircraft should show a clear line of accountability and delegation of authority from the program or cognizant secretarial office to the person with authority to manage and oversee the aviation program and approve the use of or dispatch or release an aircraft for flight.
    - (1) The authority to approve a Government aircraft flight for mission requirements should be delegated, but not limited to the following:
      - (i) DOE Field element or program managers using aircraft in support of their respective programs;
      - (ii) Aviation managers, so designated by position description;
      - (iii) Designated flight dispatchers or schedulers; and/or
      - (iv) Pilot-in-Command (PIC) of the respective aircraft.
    - (2) The authority to approve a Government aircraft flight for other official travel, when no Senior Federal traveler or Non-Federal travelers are on-board, is the responsibility of the:
      - (i) Aviation Manager;
      - (ii) Program Officer; and/or

(iii) Travel Approving Official.

(3) The authority to approve the Traveler onboard a Government aircraft flight for official travel, including mission travel, involving Senior Federal travelers and Non-Federal travelers, is the responsibility of the:

(i) Travel approving official; and

(ii) Office of General Counsel, DOE.

(4) The authority to approve the Traveler onboard a Government aircraft flight for official travel, other than Senior Federal Travelers or Non-Federal travels, is the responsibility of the:

(i) Travel approving official.

(5) The authority to approve the Traveler for “required use travel” is the responsibility of the:

(i) Use of government aircraft for required use travel must be approved in advance and in writing.

(ii) A Federal officer or employee must obtain written approval for all required use travel on a trip-by-trip basis from the DOE's General Counsel, unless:

1 In the case of an officer or employee who is not an agency head, the agency head has determined that all travel by the officer or employee or travel in specified categories qualifies as required use travel, or

2 In the case of an agency head, the President has determined that all travel, or travel in specified categories, by the agency head qualifies as required use travel.

3 Any determination by an agency head that travel by an officer or employee of DOE qualifies as required use travel must be in writing and set forth the basis for that determination. In special emergencies, an after-the-fact written certification by an agency is permitted.

**5. Mission Authorization:** Some DOE missions require routine operations outside the provisions of Title 14 CFR Chapter 1 (e.g., aerial gunnery operations; unmanned aircraft operations, research and development). The Field element or program manager or their designee may grant initial authorization for such routine operations. In addition, concurrence of the Director, Office of Security Policy, should be obtained for initial approval of aircraft used in aviation missions involving Protective Forces (e.g., security



helicopters). After initial authorization for these operations is granted by the appropriate authority, no further authorization is required for conducting such operations, unless the area of operations change or other circumstances require additional risk management protocols to be exercised by management. Each mission, even routine, should have a designated approval authority, established in policy or in writing, from the responsible DOE Field element manager.

## **6. DOE Pre-flight Actions and Operating Information Required**

- (a) The Field element operating a DOE-Federal aircraft should provide the following materials, in current and appropriate form, accessible to the pilot at the pilot station, and the pilot should use them:
  - (1) A cockpit checklist;
  - (2) An emergency cockpit checklist containing the procedures required by paragraph (c) of this section, as appropriate;
  - (3) Pertinent aeronautical charts;
  - (4) Current hazard assessment map, if applicable;
  - (5) Pertinent sections of the Field element's Operations Manual or an Aviation Safety Document applicable to the mission;
  - (6) For IFR operations, each pertinent navigational enroute, terminal area, and approach and letdown chart; and
  - (7) One-engine-inoperative climb performance data and, if the aircraft is approved for use in IFR or over-the-top operations, that data must be sufficient to enable the pilot to determine that the aircraft is capable of carrying crewmembers over-the-top or in IFR conditions at a weight that will allow it to climb, with the critical engine inoperative, at least 50 feet a minute when operating at the MEA's of the route to be flown or 5,000 feet MSL, whichever is higher.
- (b) Each cockpit checklist required by paragraph C.3 (a) (1) of this section should contain the following procedures:
  - (1) Before starting engines;
  - (2) Before take-off (to include any mission equipment);
  - (3) Climb;
  - (4) Cruise;

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- (5) Descent;
  - (6) Before landing (to include any mission equipment);
  - (7) After landing; and
  - (8) Stopping engines (to include any mission equipment).
- (c) Each emergency cockpit checklist required by paragraph C3(a)(2) of this section that must contain the following procedures, as appropriate:
- (1) Emergency operation of fuel, hydraulic, electrical, and mechanical systems;
  - (2) Emergency operation of instruments and controls;
  - (3) Engine inoperative procedures;
  - (4) Any other emergency procedures necessary for safety; and
  - (5) Failure of mission equipment during flight and emergency operation of any controls.
- (d) The Field element should have policies that limit the pilot from taking off an aircraft that has frost, ice, or snow adhering to any rotor, propeller, windshield, wing stabilizing or control surface, to a power plant installation, or to an airspeed, altimeter, rate of climb, or flight attitude instrument system, except under the following conditions:
- (1) Takeoffs may be made with frost adhering to the wings, rotors, stabilizing or control surfaces, if the frost has been polished to make it smooth; and
  - (2) Takeoffs may be made with frost under the wing in the area of the fuel tanks if authorized by the FAA. (Section 121.629(c) 135.227 of Title 14 CFR Chapter 1)
- (e) The Field element may not authorize an aircraft to takeoff and no pilot may takeoff an aircraft any time conditions are such that frost, ice, or snow may reasonably be expected to adhere to the aircraft unless the pilot has completed the training required in Chapter VII paragraph 5. (c) 3 D and unless one of the following requirements is met:
- (1) A pre-takeoff contamination check, that has been established by the Field element and approved by the FAA for the specific aircraft type, has been completed within 5 minutes prior to beginning takeoff. A pre-takeoff contamination check is a check to make sure the wings and control surfaces are free of frost, ice, or snow.

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- (2) The Field element has an FAA approved alternative procedure and under that procedure, the aircraft is determined to be free of frost, ice, or snow.
  - (3) The Field element has an FAA approved deicing/anti-icing program that complies with Section 121.629(c) or 135.227 of Title 14 CFR Chapter 1 and the takeoff procedures comply with that program.
- (f) Except for an aircraft that has ice protection provisions that meet 14 CFR part 25 or item 34 Appendix A of Part 135 or rotorcraft or transport category aircraft type certification, no pilot should fly:
- (1) Under IFR into known or forecast light or moderate icing conditions; or
  - (2) Under VFR into forecast light or moderate icing conditions, unless the aircraft has functioning deicing or anti-icing equipment protecting each propeller, rotor, power plant, windshield, wing, stabilizing or control surface, and each airspeed, altimeter, rate of climb, or flight attitude instrument system.
- (g) If current weather reports and briefing information, relied upon by the pilot-in-command, indicate that the forecast icing condition that would otherwise prohibit the flight will not be encountered during the flight because of changed weather conditions since the forecast, the restrictions in paragraph (f) of this section based on forecast conditions do not apply.
- (h) The Field element should establish a policy that before each takeoff, each pilot-in-command of an aircraft carrying passengers should ensure that all personnel have been orally briefed on:
- (1) Smoking. Each person should be briefed on when, where, and under what conditions smoking is prohibited. This briefing should include a statement that the Federal Aviation Regulations require crewmember compliance with the lighted passenger/crewmember information signs, posted placards, areas designated for safety purposes as no smoking areas, and passenger/crewmember instructions with regard to these items;
  - (2) The use of safety belts, including instructions on how to fasten and unfasten the safety belts. Each person should be briefed on when, where, and under what conditions the safety belt must be fastened about him or her. This briefing should include a statement that the Federal Aviation Regulations require passenger/crewmember compliance with lighted passenger/crewmember information signs and passenger/crewmember instructions concerning the use of safety belts;
  - (3) The placement of seat backs in an upright position before takeoff and landing;

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- (4) Location and means for opening the entry door and emergency exits;
  - (5) Location of survival equipment;
  - (6) If the flight involves extended over-water operation, ditching procedures and the use of required flotation equipment;
  - (7) If the flight involves operations above 12,000 feet MSL, the normal and emergency use of oxygen;
  - (8) Location and operation of fire extinguisher(s); use and operation of mission equipment;
  - (9) Mission objectives; and
  - (10) Any known hazards.
- (i) Before each takeoff, the pilot-in-command should ensure that each person who may need the assistance of another person to move expeditiously to an exit if an emergency occurs and that person's attendant, if any, has received a briefing as to the procedures to be followed if an evacuation occurs.
  - (j) Paragraphs (h) and (i) do not apply to a person who has been given a briefing before a previous leg of a flight in the same aircraft.
  - (k) The oral briefing required by paragraph (h) should be given by the pilot-in-command or a member of the flight crew. It should be supplemented by printed cards for the use of each passenger/crewmember containing:
    - (1) A diagram and method of operating the emergency exits; and
    - (2) Other instructions necessary for the use of emergency equipment on board the aircraft.
  - (l) Each card used under this paragraph should be carried in the aircraft in locations convenient for the use of each passenger/crewmember and must contain information that is appropriate to the aircraft on which it is to be used. The Field element should describe in its AIP, operations manual or policy document the procedure to be followed in the briefing required by paragraph (h) of this section.
  - (m) If the aircraft does not proceed directly over water after takeoff, no part of the briefing required by paragraph (h)(6) of this section has to be given before takeoff but the briefing required by paragraph (h) (6) should be given before reaching the over water part of the flight.
  - (n) The briefing required by paragraph (h)(1) through (8) of this section should be part of the initial and recurrent training program for crewmembers and qualified

non-crewmembers and is not required before each flight, if the pilot-in-command ensures the crewmember or qualified non-crewmember understand their responsibilities. However, the briefing elements (h)(9) and (10) must be briefed prior to flight by the pilot-in-command.

- (o) The Field element must develop a method or process for disseminating the briefing information required by National Transportation Safety Board (NTSB) document Federal Plan for Aviation Accidents Involving Aircraft Operated by or Chartered by Federal Agencies, Appendix F (NTSB/SPC-99-04), to all personnel who are onboard a DOE government aircraft.
- (p) The Field element should ensure policies and processes are established to address the recording of maintenance discrepancies found during pre-flight and how the pilot-in-command determines if maintenance discrepancies from the previous flight, if any, are corrected prior to departure.
- (q) The Field element should ensure policies and processes are established to address security as recommended in Chapter XXVI of this guide.

## **7. DOE Pre-flight Actions Flight Plans**

- (a) An FAA flight plan appropriate to the conditions of flight (Instrument Flight Rules (IFR), Visual Flight Rules (VFR)) should be filed with a responsible party for each flight of a DOE-Federal aircraft or in accordance with the Field element's flight locating or flight following procedures, unless required by 14 CFR Chapter 1, parts 91, 121 or 135 or the contractor's FAA issued Operations Specifications.
- (b) A pilot departing a location without communications facilities may file a flight plan as soon as practical after he/she becomes airborne.
- (c) A pilot remaining within 25 statute miles of the point of departure need not file a flight plan if he/she notifies air traffic controllers or an appropriate responsible DOE official of his/her location, estimated flight time, and intent.
- (d) A manifest with the name(s) of all crewmembers and any personnel on-board should be given to the DOE representative or left with the contractor's organization. The manifest will consist of the full name of each person for each leg of the flight, a person to be contacted in the event of an emergency (who is not aboard the flight), and a telephone number for the emergency contact. An alternate method to the emergency contact information on the manifest would be where the local Human Resource departments maintain current contact information, and then the emergency contact information is not required.

## **8. DOE Pre-flight Actions Flight Locating Information**

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- (a) A Field element should establish a process or procedure when VFR flight plans are not practical. The Field element's flight locating processes or procedures should ensure:
- (1) A planned route of flight is filed;
  - (2) The Estimated Time Enroute (ETE);
  - (3) Estimated Time of Arrival (ETA);
  - (4) Number and identity of individuals on board the aircraft;
  - (5) Person to be contacted in the event of an emergency (who is not aboard the flight) see paragraph 7(d);
  - (6) Telephone number for the emergency contact see paragraph 7(d)
  - (7) At least the information required to be included in a VFR flight plan;
  - (8) For timely notification of an FAA facility or search and rescue facility, if an aircraft is overdue or missing; and
  - (9) The location, date, and estimated time for reestablishing radio or telephone communications, if the flight will operate in an area where communications cannot be maintained.
- (b) Flight locating information shall be retained at the Field element's principal operations base, or at other places designated by the Field element in the flight locating or flight following procedures, until the completion of the flight.
- (c) Each Field element should furnish the representative of the FAA, if applicable, with a copy of its flight locating procedures and any changes or additions, unless those procedures are included in a manual required by the FAA.
- (d) The flight crew should update the ETA if they expect to arrive more than 30 minutes after the planned ETA.
- (e) The flight crew of a security helicopter operating within the boundary of a site should update their ETA if they expect to arrive more than 15 minutes after their planned ETA.
- (f) The flight crew should notify the responsible personnel when the aircraft has landed. If the flight crew has not made notification of their landing within the appropriate amount of time following the planned ETA, the responsible personnel should initiate a search for the aircraft.
- (g) Initiating Search and Rescue: A Field element should establish processes or procedures for initiating search and rescue for aircraft that are overdue or missing.

Processes or procedures should ensure essential personnel are notified, including the FAA, and that a record is kept of the steps taken and time of each event during the search and rescue.

- 9. DOE Pre-flight Actions Weight and Balance:** DOE/NNSA elements should ensure that a Flight crewmember or Flight Dispatcher perform weight and balance calculations to ensure that aircraft are within manufacturer's and FAA- or military-established weight and balance limitations for each operation, flight, or mission profile for which the aircraft are to be operated. Where mission profiles remain constant (e.g., emergency medical evacuation, aerial patrols, etc.) then a single mission weight and balance may be kept for that mission profile.

**10. DOE Pre-flight Actions Airport Requirements**

- (a) The Field element should ensure policies establish that Flight crewmembers should not use any landing site or airport unless it is adequate for the proposed operation, considering such items as size, aircraft weight and performance, surface, altitude, density altitude, obstructions, and lighting.
- (b) An effective takeoff plan shall be developed which allows a considered sequence of actions to be implemented without delay if an emergency arises. Performance charts can be used to compute aircraft response resulting from various types of engine failures, environmental conditions, aircraft loading, and other factors affecting aircraft performance upon takeoff.
- (c) DOE Federal aircraft should be capable of maintaining a minimum climb gradient of 200 feet per nautical mile at airports for which there are no published IFR departure procedures or nonstandard IFR takeoff minimums [14 CFR parts 121.189 (d) or 135.379]. The aircraft must also be capable of maintaining any climb gradient established in the Standard Instrument Departures, Obstacle Departure Procedure or in published IFR takeoff procedures. With regard to fixed wing aircraft, takeoffs will be accomplished only when runway lengths are sufficient to provide for a balanced field condition. (When  $V_1$  is selected such that the accelerate-stop distance is equal to the accelerate-go distance, this distance is known as the balanced field length. In general, the balanced field length represents the minimum runway length that can be used for takeoff.)
- (d) The pilot of an airplane at night may not take off from, or land on, any landing site or airport unless:
  - (1) That pilot has determined the wind direction from an illuminated wind direction indicator or local ground communications, or in the case of takeoff, that pilots personal observations; and
  - (2) The limits of the area to be used for landing or takeoff are clearly shown by boundary or runway marker lights.

For the purposes of paragraph (d) of this section, if the area to be used for takeoff or landing is marked by flare pots or lanterns, their use must be approved by the FAA.

- (e) No pilot of a helicopter at night may take off from, or land on, any landing site or airport unless:
  - (1) That pilot has determined the wind direction from an illuminated wind direction indicator or local ground communications, or that pilot's personal observations; and
  - (2) That pilot has determined the limits of the area to be used for landing or takeoff are sufficient considering gross weight, density altitude, and performance of the aircraft.
- (f) Standard Instrument Departures (SID)/IFR Departure Procedures: At those locations where SIDs are available, pilots are encouraged to utilize them for each IFR departure, provided no unacceptable flight delays ensue. Appropriate SID and IFR departure procedures should be reviewed and utilized for IFR departure to ensure separation from aircraft and obstacles during takeoff.

**11. DOE Pre-flight Actions Cargo Operations:** Cargo operations conducted under Departmental operational control should be done in accordance with the Federal Aviation Regulations and applicable regulations governing the movement of hazardous materials.

- (a) At all times, it is important to ensure that cargo is secured and prevented from any unplanned movement on board the aircraft. Cargo should be appropriately secured prior to and during flight.
- (b) Only approved items, under 49 CFR Subchapter C, should be transported by air. DOE/NNSA elements should have appropriate manuals for conducting cargo operations in accordance with 14 CFR and 49 CFR.
- (c) DOE Federal aircraft may carry hazardous material under the DOT Special Permit issued for DOE aircraft.
- (d) Hazardous materials operations should be reviewed annually, and policy statements, regulations, and procedures should be followed by DOE employees and DOE contractors.
- (e) Title 49 Parts 171 through 175 and the Convention on International Civil Aviation "Technical Instructions for the Safe Transport of Dangerous Goods by Air" require a program to ensure that no employee or agent of DOE will accept or cause to be transported any hazardous materials without following appropriate procedures.



- (f) The hazardous materials program should ensure that DOE complies with the requirements of the FAA approved Hazardous Materials Recognition Program for all individuals that perform duties involving passengers' carry-on or checked baggage or have responsibilities involving the acceptance; handling, storage or transport of freight or packages. (Refer to Chapter VII, paragraph 5(a)(1))
- (g) DOE should ensure that hazardous materials information warning signs as required by 49 CFR are posted at appropriate locations advising shippers and passengers of DOE policy and of the potential hazards associated with the offering and/or carriage of such materials onboard an aircraft if the shipper and/or the operator fail to comply with the requirements of 49 CFR Parts 172.25 and 175.26.
- (h) DOE should advise the proper authorities of incidents or discrepancies that are discovered as described in 49 CFR Part 175.
- (i) DOE should ensure that hazardous materials recognition training of employees and/or agents should be satisfactorily completed. A copy of this training documentation should be maintained until 90 days after the employee's termination date.

**12. DOE Departure Actions and Operations Airman: Limitations on Use of Services**

- (a) Field elements should establish policies that ensure flight crewmember(s):
  - (1) Hold(s) an appropriate current airman certificate issued by the FAA;
  - (2) Has any required appropriate current airman and medical certificates in that person's possession while engaged in flight operations; and
  - (3) Is otherwise qualified for the operation for which that person is to be used.
- (b) Each flight crewmember covered by paragraph 12(a) of this section should present the certificates for inspection upon the request of the FAA or DOE official.
- (c) Field elements operating or owning unmanned aircraft systems should establish policies that ensure pilots (flight crewmembers) listed in Chapters V and VII.

**13. DOE Departure Actions and Operations Airman: Composition of Flight crew**

- (a) Field elements should establish policies that ensure no aircraft is operated with less than the minimum flight crew specified in the type certificate data sheet, supplemental type certificate data sheet, FAA approved Aircraft Flight Manual, Rotorcraft Flight Manual, manufacturer's manual, or military operations manual for that type aircraft and for the kind of operation being conducted.

- (b) In any case in which the Title 14 CFR Chapter 1, Part 91 requires the performance of two or more functions for which a flight crewmember certificate is necessary that requirement is not satisfied by the performance of multiple functions at the same time by one flight crewmember.
- (c) On each flight requiring a flight engineer, at least one flight crewmember, other than the flight engineer, must be qualified to provide emergency performance of the flight engineer's functions for the safe completion of the flight if the flight engineer becomes ill or is otherwise incapacitated. A pilot need not hold a flight engineer's certificate to perform the flight engineer's functions in such a situation.

#### **14. DOE Departure Actions and Operations Flight Crewmembers at Controls**

- (a) Field elements should establish policies that ensure, except as provided in paragraph (b) of this section, each required flight crewmember on flight deck duty must remain at the assigned duty station with seat belt fastened while the aircraft is taking off or landing and while it is enroute.
- (b) A required flight crewmember may leave the assigned duty station:
  - (1) If the crewmember's absence is necessary for the performance of duties in connection with the operation of the aircraft;
  - (2) If the crewmember's absence is in connection with physiological needs; or
  - (3) If the crewmember is taking a rest period and relief is provided:
    - (i) In the case of the assigned pilot-in-command, by a pilot qualified to act as pilot-in-command.
    - (ii) In the case of the assigned second-in-command, by a pilot qualified to act as second-in-command of that aircraft during enroute operations.

**15. DOE Departure Actions and Operations Dual Controls Required:** Field elements should establish policies that ensure no person may operate an aircraft in operations requiring two pilots unless it is equipped with functioning dual controls. However, if the aircraft type certification operating limitations do not require two pilots; a throw-over control wheel may be used in place of two control wheels.

#### **16. DOE Departure Actions and Operations Crewmember Information**

- (a) Field elements should establish policies that ensure no person should operate a large aircraft carrying personnel unless it establishes procedures in the Field elements AIP, Flight Operations Manual or policy document, or is equipped with signs that meet the requirements of Title 14 CFR Chapter 1, Part 25, Section 25.791 that are visible to crewmembers to notify them when smoking is

prohibited and when safety belts must be fastened. The signs must be constructed so that the crew can turn them on and off. They must be turned on during aircraft movement on the surface, for each takeoff, for each landing, and when otherwise considered to be necessary by the pilot-in-command.

- (b) No passenger/crewmember may smoke while any No Smoking sign is lighted or the instruction No Smoking has been given by the pilot-in-command; nor may any crewmember smoke in any lavatory.
- (c) Each passenger/crewmember required on board an aircraft must occupy a seat or berth and shall fasten his or her safety belt about him or her and keep it fastened while any Fasten Seat Belt sign is lighted.
- (d) Each passenger/crewmember shall comply with instructions given him or her by the Pilot-in-command or second-in-command regarding compliance with paragraphs (b) and (c) of this section.
- (e) Carriage of cargo or test equipment in crewmember compartments. Field elements should establish policies that ensure no pilot-in-command permits cargo to be carried in any aircraft unless:
  - (1) It is carried in an approved cargo rack, bin, or compartment installed in the aircraft;
  - (2) It is secured by means approved by the FAA; or
  - (3) It is carried in accordance with each of the following:
    - (i) It is properly secured by a safety belt or other tie-down having enough strength to eliminate the possibility of shifting under all normally anticipated flight and ground conditions.
    - (ii) It is packaged or covered to avoid possible injury to crewmembers or passengers.
    - (iii) It does not impose any load on seats or on the floor structure that exceeds the load limitation for those components.
    - (iv) It is not located in a position that restricts the access to or use of any required emergency or regular exit, or the use of the aisle between the crew and the passenger compartment.
    - (v) It is not carried directly above seated crewmembers or personnel.
- (f) Carriage of cargo in cargo compartments. Field elements should establish policies that ensure when cargo is carried in cargo compartments that are designed to require the physical entry of a crewmember to extinguish any fire that

may occur during flight, the cargo must be loaded so as to allow a crewmember to effectively reach all parts of the compartment with the contents of a hand-held fire extinguisher.

- (g) Stowage of food, beverage, and crewmember service equipment during aircraft movement on the surface, takeoff, and landing Field elements should establish policies that state:
  - (1) No Field element should allow any movement of an aircraft on the surface, take off, or land when any food, beverage, or tableware, furnished by the Field element or crew, is located at any crewmember seat.
  - (2) No Field element should allow any movement of an aircraft on the surface, take off, or land unless each food and beverage tray and seat back tray table is secured in its stowed position.
  - (3) No Field element should permit an aircraft to move on the surface, take off, or land unless each crewmember serving cart and loose mission equipment is secured and stowed.
  - (4) Each crewmember, passenger, or qualified non-crewmember should comply with instructions given by the pilot-in-command with regard to compliance with this section.

**17. DOE Departure Actions and Operations Crewmembers Other Than Airmen (Essential Crew)**

- (a) The number of crewmembers authorized on board an aircraft will be determined by:
  - (1) Type certificate;
  - (2) Number of approved seats installed; or
  - (3) Set forth in the mission specifications, for the specific mission being flown.
- (b) During takeoff and landing, the pilot-in-command, will ensure that crewmembers are located as near as practicable to exits and shall be uniformly distributed throughout the aircraft to provide the most effective egress of crewmembers in event of an emergency evacuation.

**18. DOE Departure Actions and Operations-Weather Minimums**

- (a) Fixed-wing Takeoff Minimums

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- (1) A pilot-in-command of a DOE-Federal airplane should not take off an airplane from an airport where weather conditions are at or above takeoff minimums but are below authorized IFR landing minimums unless there is an alternate airport within 1 hour's flying time (at normal cruising speed, in still air) of the airport of departure.
  - (2) A pilot-in-command of a DOE-Federal airplane should not takeoff an airplane under IFR or begins an IFR or over-the-top operation unless the latest weather reports or forecasts, or any combination of them, indicate that weather conditions at the estimated time of arrival at the next airport of intended landing will be at or above authorized IFR landing minimums.
- (b) Helicopter Takeoff Minimums: Single pilot helicopter operations should require takeoff weather minimums of 500 feet ceiling and 1/2 mile visibility. The pilot-in-command of a DOE-Federal helicopter is authorized to depart under terms of a Special VFR clearance when takeoff weather is below these minimums when, in the judgment of the pilot-in-command, such operations are necessary and can be safely accomplished, in accordance with 14 CFR Part 91. Dual-pilot helicopter operations may use Special VFR weather criteria without restriction.
  - (c) Destination with Alternate: No pilot-in-command may designate an airport as an alternate unless the weather reports or forecasts, or any combination of them, indicate that the weather conditions will be at or above authorized alternate airport landing minimums for that airport at the estimated time of arrival.
  - (d) Destination with Two Alternates: Pilot-in-command may be cleared to a destination when prevailing ceiling and visibility are forecast to be below minimums for precision or non-precision approaches at the estimated time of arrival if two alternates are named in the clearance, and if the second alternate meets the appropriate criteria.
  - (e) Destination with No Alternate Required: No alternate airport is required if for at least one hour before and after the estimated time of arrival at the destination, the appropriate weather reports or forecasts, or any combination thereof, indicates that:
    - (1) The ceiling will be at least 2,000 feet above the airport elevation, and
    - (2) Visibility will be at least three miles.
  - (f) Destination with No Alternate Available: The destination must meet the weather minimums stated in paragraph 10. This requirement is intended to address operations into remote, foreign, arctic or island destinations where an alternate does not exist or is beyond practical fuel range.
  - (g) Alternate Weather Minimums

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- (1) Except as provided in paragraph (b) of this section, a pilot-in-command of a DOE-Federal aircraft should not operate an aircraft in IFR conditions unless it carries enough fuel (considering weather reports or forecasts or any combination of them) to:
    - (i) Complete the flight to the first airport of intended landing;
    - (ii) Fly from that airport to the alternate airport; and
    - (iii) Fly after that for 45 minutes at normal cruising speed or, for helicopters, fly after that for 30 minutes at normal cruising speed.
  - (h) Paragraph (a)(2) of this section does not apply if Part 97 of Title 14 CFR Chapter 1 prescribes a standard instrument approach procedure for the first airport of intended landing and, for at least one hour before and after the estimated time of arrival, the appropriate weather reports or forecasts, or any combination of them, indicate that:
    - (1) The ceiling will be at least 1,500 feet above the lowest circling approach MDA; or
    - (2) If a circling instrument approach is not authorized for the airport, the ceiling will be at least 1,500 feet above the lowest published minimum or 2,000 feet above the airport elevation, whichever is higher; and
    - (3) Visibility for that airport is forecast to be at least three miles, or two miles more than the lowest applicable visibility minimums, whichever is the greater, for the instrument approach procedure to be used at the destination airport.
- 19. Alternate Airports Outside CONUS:** For an airfield to qualify as an alternate for destination outside CONUS, the pilot-in-command should use the worst prevailing weather forecast for the estimated time of arrival, plus or minus one hour, but in no case may an airfield be named as an alternate if the forecast weather is below published approach minimums.
- 20. DOE Enroute Actions and Operations Oxygen for Medical Use by Crewmembers**
- (a) Except as provided in paragraphs (h) and (i) of this section, each Field element should not allow the carriage or operation of equipment for the storage, generation, or dispensing of medical oxygen unless the unit to be carried is constructed so that all valves, fittings, and gauges are protected from damage during that carriage or operation and unless the following conditions are met:
    - (1) The equipment should be:

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- i. Of an approved type or in conformity with the manufacturing, packaging, marking, labeling, and maintenance requirements of Title 49 CFR Parts 171, 172, and 173, except Section 173.24(a)(1);
    - ii. When owned by the Field element, maintained under the Field element's maintenance program;
    - iii. Free of flammable contaminants on all exterior surfaces; and
    - iv. Appropriately secured.
  - (b) When the oxygen is stored in the form of a liquid, the equipment should be under the Field element's maintenance program since its purchase new or since the storage container was, last purged.
  - (c) When the oxygen is stored in the form of a compressed gas as defined in Title 49 CFR 173.300(a):
    - i. When owned by the Field element, it should be maintained under the Field element's maintenance program; and
    - ii. The pressure in any oxygen cylinder should not exceed the rated cylinder pressure.
  - (d) The pilot-in-command must be advised when the equipment is on board and when it is intended to be used.
  - (e) The equipment should be stowed, and each person using the equipment should be seated so as not to restrict access to or use of any required emergency or regular exit or of the aisle in the crewmember/passenger compartment.
  - (f) When oxygen is being used, no person may smoke and no Field element may allow any person to smoke within 10 feet of oxygen storage and dispensing equipment carried under paragraph (a) of this section.
  - (g) The Field element should not allow any person other than a person trained in the use of medical oxygen equipment to connect or disconnect oxygen bottles or any other ancillary component while any crewmember is aboard the aircraft.
  - (h) Paragraphs (2), (3), and (4) of this section do not apply when that equipment is furnished by a professional or medical emergency service for use on board an aircraft in a medical emergency when no other practical means of transportation (including any other properly equipped commercial service provider) is reasonably available and the person carried under the medical emergency is accompanied by a person trained in the use of medical oxygen.

- (i) Each Field element, under the authority of paragraph (20) of this section, deviates from paragraphs (b), (c), and (d) of this section under a medical emergency should establish a procedure for notifying DOE management, after the deviation, with a complete report of the operation involved, including a description of the deviation and the reasons for it.

**21. DOE Enroute Actions and Operations Manipulation of Controls:** Field elements should establish a policy that states:

- (a) That no pilot-in-command should allow any person to manipulate the controls of an aircraft during flight, nor should any person manipulate the controls during flight, unless that person is a qualified and current pilot of the Field element operating that aircraft; or
- (b) The Field element is conducting training under 14 CFR part 61 of this chapter; or
- (c) Flight crewmember training is being conducted in accordance with the Field element's training program.

**22. DOE Enroute Actions and Operations Admission to Flight Deck:** Field elements should establish a policy that states:

- (a) No person should admit any person to the flight deck of an aircraft unless the person being admitted is:
  - (1) A Flight crewmember;
  - (2) A crewmember;
  - (3) An FAA inspector or an authorized representative of the National Transportation Safety Board who is performing official duties;
  - (4) A DOE representative who is performing official duties; or
  - (5) Any person who has the permission of the pilot-in-command.
- (b) No person should admit any person to the flight deck during ground or airborne operation unless there is a seat available for the use of that person in the crewmember compartment, except:
  - (1) An FAA inspector or an authorized representative of the FAA Administrator or National Transportation Safety Board who is checking or observing flight operations; or
  - (2) A certificated airman employed by the Field element whose duties require an airman certificate.



**23. DOE Enroute Actions and Operations Inspector's Credential's / Admission to Pilots' Compartment**

- (a) Whenever, in performing the duties of conducting an inspection, an FAA inspector presents an Aviation Safety Inspector credential, FAA Form 110A, to the pilot-in-command of an aircraft operated by a Field element, the inspector must be given free and uninterrupted access to the pilot compartment of that aircraft. However, this paragraph does not limit the emergency authority of the pilot-in-command to exclude any person from the pilot compartment in the interest of safety.
- (b) A forward observer's seat on the flight deck, or forward crewmember seat with headset or speaker, must be provided for use by the FAA or DOE representative that is a certificated airman while conducting enroute inspections. The suitability of the location of the seat and the headset or speaker for use in conducting enroute inspections is determined by the FAA.

**24. DOE Enroute Actions and Operations Emergencies, Field elements should establish a policy that states:**

- (a) In an emergency that requires immediate decision and action, the pilot-in-command may take any action considered necessary under the circumstances. In such a case, the pilot-in-command may deviate from prescribed operations, procedures and methods, weather minimums, and the Federal Aviation Regulations, to the extent required in the interests of safety.
- (b) In an emergency situation arising during flight that requires immediate decision and action by appropriate management personnel in the case of operations conducted with a flight following service and which is known to them, those personnel should advise the pilot-in-command of the emergency, should ascertain the decision of the pilot-in-command, and should have the decision recorded. If they cannot communicate with the pilot, they should declare an emergency and take any action that they consider necessary under the circumstances.
- (c) Whenever emergency authority is exercised, the pilot-in-command or the appropriate management personnel shall keep the appropriate ground radio station fully informed of the progress of the flight. The person declaring the emergency should send a written report of any deviation, through the Field element's Aviation Manager or the Director of Operations, to the FAA and the Office of Aviation Management within 10 days, if requested, exclusive of Saturdays, Sundays, and Federal holidays, after the flight is completed or, in the case of operations outside the United States, upon return to the home base.
- (d) Reporting potentially hazardous meteorological conditions and irregularities of ground and navigation facilities. Field elements should establish a policy that states: Whenever the pilot-in-command encounters a meteorological condition or

an irregularity in a ground or navigational facility in flight, the knowledge of which the pilot-in-command considers essential to the safety of other flights, the pilot-in-command should notify an appropriate FAA ground station as soon as practicable.

**25. DOE Enroute Actions and Operations VFR: Minimum Altitudes for Special Operations,** Field elements should establish a policy that states:

- (a) The Field element must comply with Title 14 CFR Chapter 1, Part 91, §91.119 unless conducting the following special operations;
- (b) Law Enforcement: except when necessary for takeoff and landing, no person should operate under VFR unless:
  - (1) An airplane complies with 14 CFR Chapter 1, Section 91.119.
  - (2) A Helicopter operated over a congested area at an altitude less than 300 feet above the surface, or at an altitude approved by the FAA.
- (c) Biological or Radiological survey or game count activities, except when necessary for takeoff and landing, no person should operate under VFR unless:
  - (1) Airplane - At an altitude that allows the pilot-in-command to safely land the aircraft in the event of an emergency without presenting a hazard to persons or property on the ground, and has established written safety procedures including; low level flight training, collision avoidance, high and low reconnaissance procedures, and any other procedures the Field element deems necessary.
  - (2) Helicopter - At an altitude that allows the pilot-in-command to safely land the aircraft in the event of an emergency without presenting a hazard to persons or property on the ground, and established written safety procedures including; low level flight training, collision avoidance, high and low reconnaissance procedures, and any other procedures the Field element deems necessary.
- (d) Fire fighting and/or forest management activities; except when necessary for takeoff and landing, no person may operate under VFR unless:
  - (1) Airplane - At an altitude that allows the pilot-in-command to safely land the aircraft in the event of an emergency without presenting a hazard to persons or property on the ground, and has established written safety procedures including; low level flight training, collision avoidance, high and low reconnaissance procedures, multiple aircraft in close proximity operations procedures, minimum visibility requirements, and any other procedures the Field element deems necessary.

- (2) Helicopter - At an altitude that allows the pilot-in-command to safely land the aircraft in the event of an emergency without presenting a hazard to persons or property on the ground, and has established written safety procedures including; low level flight training, collision avoidance, high and low reconnaissance procedures, multiple aircraft in close proximity operations procedures, minimum visibility requirements, and any other procedures the Field element deems necessary.

**26. DOE Enroute Actions and Operations VFR: Visibility Requirements,** Field elements should establish a policy that states:

- (a) No person may operate an airplane under VFR in Class G airspace contrary to Title 14 CFR Chapter 1, Part 91, §91.155.
- (b) No person may operate a helicopter under VFR in Class G airspace at an altitude of 1,200 feet or less above the surface or within the lateral boundaries of the surface areas of Class B, Class C, Class D, or Class E airspace designated for an airport unless the visibility is at least:
  - (1) During the day - 1/2 mile;
  - (2) At night - 1 mile; or
  - (3) Meets the requirements of 14 CFR Chapter 1, Part 91, §91.155.

**27. DOE Enroute Actions and Operations VFR: Over-the-Top Operating Limitations,** Field elements should establish a policy that states:

- (a) Subject to any additional limitations in paragraph (a) (1) below; no person should operate an aircraft under VFR over-the-top, unless:
  - (1) Weather reports or forecasts, or any combination of them, indicate that the weather at the intended point of termination of over-the-top flight:
    - (i) Allows descent to beneath the ceiling under VFR and is forecast to remain so until at least 1 hour after the estimated time of arrival at that point; or
    - (ii) Allows an IFR approach and landing with flight clear of the clouds until reaching the prescribed initial approach altitude over the final approach facility, unless the approach is made with the use of radar under Title 14 CFR Chapter 1, Part 91, Section 91.175(f); or
- (b) It is operated under conditions allowing:
  - (1) For multi-engine aircraft, descent or continuation of the flight under VFR if its critical engine fails; or

- (2) For single-engine aircraft, descent under VFR if its engine fails.

**28. DOE Enroute Actions and Operations Low Level Operation,** Field elements should establish a policy that states:

- (a) Flight operations conducted less than 500 feet Above Ground Level (AGL) should have hazard maps that are updated at least every 60 days (except those involved in pipeline and power line patrols).
- (b) The maps should indicate height AGL of all existing obstacles and/or hazards to a flight on:
  - (i) The DOE site on which the operations occur; and
  - (ii) Along commonly used flight paths.
- (c) A FAA waiver from 14 CFR Part 91.119, (b) and (c) is required for airplanes over any congested area of a city, town, or settlement, or over any open air assembly of persons, an altitude of 1,000 feet above the highest obstacle within a horizontal radius of 2,000 feet of the aircraft or when an airplane is operated over open water or sparsely populated areas closer than 500 feet to any person, vessel, vehicle, or structure.
- (d) The operator is solely responsible for filling out and submitting a FAA Form 7711-2. (If the operator has any questions refer to the FAA Operations Inspector Handbook, 8300.1.2, Chapter 51. Issue a Certificate of Waiver or Authorization: 14 CFR part 91, §91.119(b) and/or (c) Minimum Safe Altitudes).
- (e) Where practical, the conduct of pipeline and power line patrols less than 500 feet AGL should use a system of warning signs and marker balls, supplemented with a current VFR sectional map, to alert pilots to hazards within pipeline and power line rights of way. Field elements or commercial aviation service providers operating airplanes in pipeline or power line patrols must have the required waiver referred to in paragraph (c) of this section.

**29. DOE Enroute Actions and Operations IFR Flight,** Field elements should establish a policy that states:

- (a) All IFR operations must comply with 14 CFR Chapter 1, Part 91, except where more stringent recommendations are defined in this document; and
- (b) Operations flown in Instrument Meteorological Conditions (IMC) should be conducted in multi-engine turbine-jet or turbine-propeller aircraft certified for instrument flight and should be crewed by two current, instrument-rated pilots.

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- (c) Aircraft should have dual flight instrumentation or instrumentation that is easily visible to both pilots.
  - (d) Each pilot position should be equipped with fully functional flight controls.
- 30. All Aircraft IFR:** The minimum operating altitudes should be the MEA, MSA or the altitude specified by the FAA Air Traffic Controller.
- 31. DOE Enroute Actions and Operations Night Operations,** Field elements should establish a policy that states:
- (a) For operations later than 1 hour after official sunset until 1 hour before official sunrise; or
  - (b) In Alaska, for operations during the period when a prominent unlit object cannot be seen from a distance of three (3) statute miles; or
  - (c) When the sun is more than six (6) degrees below the horizon:
    - (1) Multiengine aircraft should be used when transporting passengers.
    - (2) Flight crews should include a minimum of two current, qualified pilots who meet minimum requirements for regency of experience in night and instrument operations and the Field element's proficiency standards.
    - (3) As a minimum, both pilots should hold current commercial certificates and instrument ratings.
    - (4) Helicopters should have at least one radar altimeter with aural and visual warning systems. The radar altimeter display and the visual warning system(s) should be situated such that at least one radar altimeter display and one visual warning system are clearly visible to both pilots. Radar altimeters installed in aircraft used for night vision goggle (NVG) operations should have digital displays.
  - (d) The following minimum altitudes for unaided night flight should be maintained except during takeoff, departure, approach, and landing:
    - (1) All Aircraft-VFR. Aircraft should maintain the minimum safe altitudes required by 14 CFR Part 91, unless a waiver from 14 CFR Part 91.119 has been obtained.
  - (e) Single-pilot, single-engine aircraft operations during the period from 1 hour after official sunset until 1 hour before official sunrise should be authorized for emergency operations only and are subject to the following:

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- (1) The flight crew should obtain approval for the initiation of emergency flights during this time period from the Head of the DOE Field element, the PMA, the CSO, or their designee.
  - (2) In circumstances in which the loss of life is highly probable and immediate action is required, the pilot-in-command may initiate the flight, only after the pilot has conducted a pre-mission risk assessment to consider the identified hazards.
  - (3) If a single-pilot, single-engine aircraft is inadvertently stranded and cannot return to base prior to 1 hour after sunset, oral approval for continued operation should be obtained from the Chief Pilot, Aviation Manager, or designee. Individuals designated to approve continued operation should be listed in the Field element's aviation operations policy, manual, or AIP.
- (f) The Aviation Manager may authorize the required number of VFR night operations to allow the organizations pilots to maintain night currency and proficiency.
  - (g) The Aviation Manager should keep a log recording the dates and return times of all flights operating later than 1 hour after official sunset and 1 hour before official sunrise.
  - (h) Enhanced position-reporting and flight-following procedures should be used.
  - (i) Under no circumstances should a flight be initiated under instrument conditions or under forecast enroute Instrument Meteorological Conditions (IMC), if the pilot is not properly certified, trained, proficient and current to conduct IMC flight operations. In addition, the aircraft to be used must be certified for IFR flight.

**32. DOE Enroute Actions and Operations VFR: Night Vision Goggle Operations,** Field elements should establish a policy that states:

- (a) No person should operate an aircraft utilizing Night Vision Goggles as the main reference to horizon or attitude control unless:
  - (1) Crewmembers have completed a formal Night Vision Goggle training course in accordance with Field element's policies and procedures.
  - (2) Goggles meet the Radio Technical Commission for Aeronautics (RTCA) Minimum Operational Performance Standards (MOPS) for Night Vision Goggles.
  - (3) Aircraft cockpit lighting has been modified to meet RTCA Minimum Operational Performance Standards (MOPS) for Night Vision Goggles.

- (4) A Night Vision Goggle preventative maintenance and testing program based on the manufacture's recommendations has been implemented.
- (b) NVG flight must be conducted under Visual flight rule minima and the RTCA Operational Concept and Operational Requirements for NVG Implementation into the National Airspace System (NAS) recommendations.

### **33. DOE Approach Actions and Operations**

- (a) Instrument approach procedures and IFR landing minimums. Field elements should establish a policy that states: No person may make an instrument approach at an airport except in accordance with IFR weather minimums and the published approach procedures.
- (b) Minimum altitudes for use of autopilot. Field elements should establish a policy that states:
  - (1) Except as provided in paragraphs (2), (3), and (4) of this section, no person should use an autopilot at an altitude above the terrain which is less than 500 feet or less than twice the maximum altitude loss specified in the approved Aircraft Flight Manual or equivalent for a malfunction of the autopilot, whichever is higher.
  - (2) When using an instrument approach facility other than ILS, no person should use an autopilot at an altitude above the terrain that is less than 50 feet below the approved minimum descent altitude for that procedure, or less than twice the maximum loss specified in the approved Aircraft Flight Manual or equivalent for a malfunction of the autopilot under approach conditions, whichever is higher.
  - (3) For ILS approaches when reported weather conditions are less than the basic weather conditions in Title 14 CFR Chapter 1, Section 91.155, no person should use an autopilot with an approach coupler at an altitude above the terrain that is less than 50 feet above the terrain, or the maximum altitude loss specified in the approved Aircraft Flight Manual or equivalent for the malfunction of the autopilot with approach coupler, whichever is higher.
  - (4) Without regard to paragraph (1), (2), or (3) of this section, the FAA may issue operations specifications to allow the use, to touchdown, of an approved flight control guidance system with automatic capability, if:
    - (i) The system does not contain any altitude loss (above zero) specified in the approved Aircraft Flight Manual or equivalent for malfunction of the autopilot with approach coupler; and

- (ii) The FAA finds that the use of the system to touchdown will not otherwise adversely affect the safety standards.
- (5) Request for FAA waivers or deviations are coordinated through the OAM.
- (c) The Field element Aviation Manager or Aviation Safety Officer should evaluate the mission and operational environment to determine if higher landing minimums are warranted based on identified hazards.

#### **34. DOE Post Flight Actions and Operations**

- (a) Upon landing, the DOE Field element should establish policies for the reporting and recording of any aircraft discrepancies noted during the flight or found during post flight inspection.
- (b) The Field element should establish policies for the proper recording of flight time, cycles, landings, fuel usage, and other pertinent information.
- (c) The Field element should establish policies for the proper recording of flight crewmember, crewmember and qualified non-crewmember proficiency events and other pertinent training information.

#### **35. Applicable Standards**

Title 14 CFR Chapter 1

Title 41 CFR 102-33

Title 49 CFR Subchapter C

DOE O 440.2B

DOE O 460.1A

Convention on International Civil Aviation “Technical Instructions for the Safe Transport of Dangerous Goods by Air”

#### **36. Supplemental Guidance Documents**

FAA Order 8900.1, Flight Standards Information Management System (FSIMS).

RTCA /DO-275, Mops Night Vision Imaging Systems



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## CHAPTER X. EXTERNAL LOADS OPERATIONS

1. **Purpose:** The purpose of the Chapter is to standardize Rotorcraft External Load operations so that planning efforts, procedures, and evaluations support strict internal controls, safety, cost effective operations, compliance with laws, regulations, policies, and other requirements.
2. **Applicability:** This section contains operational procedures and systems acceptable for Departmental aviation services. The operation of other Government agency aircraft, including those of the Department of Defense (DoD) that are not under DOE operational control, is the responsibility of the respective agency.
3. **General Information**
  - (a) DOE Federal and CAS contractor aircraft external load operations should be accomplished in accordance with 14 CFR Part 133.
  - (b) A DOE Field element conducting such operations need not be certified as a 14 CFR Part 133 operator unless the Field element manager deems it necessary.
  - (c) CAS operations should be conducted by certificated 14 CFR Part 133 operators.
  - (d) A Field element that conducts or contracts for external load operations should ensure that an External Loads Manual is submitted for approval by the appropriate DOE official. Sample external load manuals are available from the DOE Office of Aviation Management or the FAA.
  - (e) The sample external load manuals should include the requirements of 14 CFR Part 133 except as it applies to hand signals. The section of the sample external load manual addressing hand signals must be customized to meet the needs of each individual aviation organization.
  - (f) The Field element conducting external load operations with DOE-Federal aircraft should establish an appropriate and comprehensive training program to address initial, recurrent, and requalification training. The training should be performance based and require initial and recurrent check rides given by a qualified check pilot.
  - (g) The Field element conducting external load operations with DOE-Federal aircraft should establish proficiency events appropriate to the operations and missions conducted, and track (document) the events by individual pilot.
4. **Hazard Assessment**
  - (a) Each organization should conduct a pre-mission planning and prior to commencing operations a job hazard assessment for these operations as required by DOE O 440.2B, Section 4, paragraph k. Aviation Safety Documentation.

- (b) All hazards should be mitigated to the lowest level possible to achieve an acceptable risk level given the specific work to be done
- (c) The following Tables may be used as guides to meet the recommendations in paragraph 4 (a) of this section:

Table 1 Pre-mission Hazard Assessment

<b>Pre-mission Planning Phase (Refer to Risk Matrix in Chapter XXI)</b>			
<b>Define the work, task, mission, and flight profile</b>	<b>Hazard Identification</b>	<b>Risk Mitigation</b>	<b>Risk Assessment/ Risk Category *</b>
External Load Operations			
Rotorcraft Class A or B external load operations that will require operation of rotary-wing aircraft below 500 feet within the boundaries of (Insert Organization's Name) facilities.	Un-qualified operator or inadequate aircraft selected for operation.	All Commercial Aviation Service vendors must be assessed by DOE qualified official(s) prior to any flight operations and thereafter every two years, if a continuing need exists.	High (IC)
	Aircraft penetrates building or structure during an emergency.	The operator will be informed and understand the aircraft must be operated at an altitude allowing, if a power unit fails, an emergency landing without undue hazard to persons or property on the surface.	Medium (ID)
	Staging area inadequate for operation.	Establish Staging area(s) that will accommodate helicopter, support trucks, crews, and any other project equipment, without causing undue hazard to equipment and personnel.  Final Approach and Take-Off Area (FATO): Length, width and diameter should be no less than: 1.5 X overall length of helicopter to be used plus a safety boundary of 12 feet.	Medium (ID)
Rotorcraft Class A or B external load operations that will require operation of rotary-wing	Aircraft takeoff and landing capability exceeded	No operation will be planned that exceeds the maximum gross weight of the aircraft given the density altitude of the planned departure site, work site, and landing area.  Weight and balance calculations will	Medium (ID)

aircraft below 500 feet within the boundaries of (Insert Organization's Name) facilities.		be made using the cargo load weight(s), aircraft equipped weight, and average density altitude to ensure operation is within the capabilities of the FAA approved Rotorcraft Flight Manual.	
	Inadequate equipment to accomplish the planned work.	The assigned aircraft will be capable of conducting the operation and rigging. Longline(s), remote hook(s), and other special equipment will be on-hand prior to commencing work.	Medium (ID)
	Inadequate training or proficiency of the crews involved.	The assigned pilot will be current and proficient for the operation being conducted and qualified in the make and model of aircraft.  Adequate ground crew, trained and current for the planned operation, will be available	Medium (ID)
	Collision with obstacles and hazards to flight.	Review maps and/or perform area recon prior to start and identify all obstacles and hazards to flight. Adjust route of flight and/or adjust long line lengths to avoid hazards.	Medium (ID)
	Fuel starvation.	Adequate preparation and planning will be made to accommodate refueling operations.	Medium (ID)
	Loss of Control due to gusty winds.	No operation will be planned that allows external load operations to start or continue when the maximum gust is in excess of 20 knots or a gust spread of 10 knots exists from the prevailing wind.	Medium (ID)
	Inadequate communications	Adequate communication systems (air-to-ground, ground-to-air, and to dispatch) will be available for the operation.	Medium (ID)
	Fatigue	The CAS vendor will ensure that flight and duty time limitations are established for the pilot and support crew while in service (Insert Organization's Name). Pilot's duty time will not exceed 14 hours in any 24-hour period and must have 10	Medium (ID)

		hours of rest within the 24-hour period while in service to (Insert Organization's Name).	
	Inadvertent IMC	No flight operations will be planned when the ceiling is less than 1000 feet and visibility is less than 1 mile.	Medium (ID)

Table 2 Prior to Starting Operations

<b>Work Phase (Refer to Risk Matrix in Chapter XXI)</b>			
<b>Define the work, task, mission, and flight profile</b>	<b>Hazard Identification</b>	<b>Risk Mitigation</b>	<b>Risk Assessment/ Risk Category *</b>
External Load Operations			
Rotorcraft Class A or B external load operations that will require operation of rotary-wing aircraft below 500 feet within the boundaries of (Insert Organization's Name) facilities.	Un-qualified operator or inadequate aircraft selected for operation.	(Insert Organization's Name) verifies the CAS vendor is accepted for use prior to initiation of flight operations.  (Insert Organization's Name) verifies CAS operator has the FAA Approved External Load Operations Manual in aircraft and Company External Load Qualification Card in the pilot's possession.	Medium (ID)
	Staging area inadequate for operation.	Perform recon of staging area(s) to ensure it will accommodate helicopter, support trucks, crews, and any other project equipment.  Final Approach and Take-Off Area (FATO): Length, width and diameter should be no less than: 1.5 X overall length of helicopter to be used plus a safety boundary of 12 feet.	Medium (ID)
	Aircraft takeoff and landing capability exceeded	Pilot will complete weight and balance calculation considering current density altitude, actual cargo load weight(s), and aircraft (A/C) equipped weight to ensure A/C can be operated within the capabilities of the FAA approved Rotorcraft Flight Manual.	Medium (ID)

Inadequate equipment to accomplish the planned work.	Pilot ensure adequate aircraft, rigging, long line(s), remote hook(s), and other special equipment are on-hand prior to commencing work.	Medium (ID)
Inadequate training or proficiency of the crews involved.	DOE (Insert Organization's Name) will validate the assigned pilot is current and proficient (Log book or Training records) for the type of operation being conducted and qualified in the make and model of aircraft.  Pilot in command (PIC) ensures adequate ground crews are available to accomplish the tasks to complete the work and are trained and current for the planned operation.	Medium (ID)
Inadequate communications	PIC will ensure adequate communication systems (air-to-ground, ground-to-air, and to dispatch) are available and tested prior to operation.  Any malfunction affecting the reliability and effectiveness of communications requires a STOP WORK until resolved	Medium (ID)
Collisions with obstacles or hazards to flight	PIC will review maps and/or perform area recon above 500' AGL to identify all obstacles and hazards to flight. Adjust route of flight or longline lengths to avoid hazards.	Medium (ID)
Fuel starvation.	Aircraft will be operated at all times with no less than 20 minutes of fuel reserve based on average Fuel Burn Rate for the aircraft in use.	Medium (ID)
Wire strike potential	Wire strike prevention kit installed on aircraft, if FAA approved for the model of aircraft.  Area map and recon completed and route and altitudes of flight path established to avoid static wires, conductors, etc.	Medium (ID)
Pilot and crew fatigue	Pilot has had at least 10 hours rest prior to flight operations and flight operations limited to 8 flight hours and 14 duty hours.  Job Foreman ensures ground personnel are adequately rested and alert to perform duties.	Medium (ID)

	Aircraft Mechanical Failures	The pilot will ensure all maintenance discrepancies are corrected prior to flight, the aircraft is airworthy, and in safe condition for flight or inoperable equipment is deferred I/A/W FAA approved Minimum equipment List.	Medium (ID)
	Engine Failure	The pilot will ensure all maintenance is accomplished I/A/W the manufacturer's maintenance program, including compliance to airworthiness directives and retirement life schedules.  Pilot will brief ground crews prior to start of the job on the emergency procedures, communications, and actions to be taken by the ground crew.	Medium (ID)
	Tail Rotor Failure	The pilot will ensure all maintenance is accomplished I/A/W the manufacturer's maintenance program, including compliance to airworthiness directives (ADs) and retirement life schedules.  Pilot will brief ground crews prior to start of the job on the emergency procedures, communications, and actions to be taken by the ground crew.	Medium (ID)
	Hydraulic Control Failure	The pilot will ensure all maintenance is accomplished I/A/W the manufacturer's maintenance program, including compliance to ADs and retirement life schedules.  Pilot will brief ground crews prior to start of the job on the emergency procedures, communications, and actions to be taken by the ground crew.	Medium (ID)
	Remote Hook will not release load.	Pilot will prior to flight ensure the remote hook electrical connections to the airframe, long line, and remote hook are properly secured using electrical tape or other acceptable method.  The pilot will brief ground crews prior to start of the job on the following: 1) methods of manually releasing the	Medium (ID)

		<p>load from the remote cargo hook; 2) pilot will return to pick-up point to correct malfunction; or 3) in an emergency, the pilot will jettison the load from the “belly hook.”</p>	
	<p>Long line snags on ground, trees or structures resulting in dynamic rollover.</p>	<p>Pilot will brief ground crews prior to start of the job on the emergency procedures, communications, and actions to be taken by the ground crew in the event of this emergency</p> <p>Prior to start, the pilot will visually check to verify if the long line is attached to the aircraft’s belly hook and properly secured.</p> <p>If so, the pilot will verify the long line is extended out from the belly hook along the centerline of the aircraft to a point forward of the nose of the aircraft where the pilot while seated can visually observe the long line.</p> <p>The pilot will ensure the long line does not cross over any part of the landing gear.</p> <p>The pilot will use a vertical ascent maintaining eye contact with the long line until clear of the landing zone or drop zone.</p> <p>The pilot will jettison the long line from the aircraft’s “belly hook,” if it becomes entangled.</p>	<p>Medium (ID)</p>
	<p>Aircraft’s “belly hook” fails to release electrically.</p>	<p>Pilot will brief ground crews prior to start of the job on the emergency procedures, communications, and actions to be taken by the ground crew in the event of this emergency.</p> <p>Pilot will jettison the load using the manual release.</p>	<p>Medium (ID)</p>
	<p>Loss of Control due to gusty winds.</p>	<p>Flight operations will cease when the maximum wind gust is in excess of 20 knots or a gust spread of 10 knots exists from the prevailing wind, or at the pilot’s discretion.</p>	<p>Medium (ID)</p>

Rotorcraft Class A or B external load operations that will require operation of rotary-wing aircraft below 500 feet within the boundaries of (Insert Organization's Name) facilities.	Inadvertent IMC	External load flight operations will cease when the ceiling is less than 1000 feet and visibility is less than 1 mile.	Medium (ID)
	Radiological or exposure to other ground based or airborne hazards.	Pilot and crew will be briefed on potential radiological or other potential hazards.	Medium (ID)
	Aircraft penetrates building or structure during an emergency.	The operator will be informed and understand the aircraft must be operated at an altitude allowing, if a power unit fails, an emergency landing without undue hazard to persons or property on the surface.	Medium (ID)

## 5. Additional Administrative Controls for External Load Operations

- (a) The aircraft are required to be operated in accordance with the FAA approved Rotorcraft Flight Manual and adhere to limitations established for that model of aircraft.
- (b) During the external load operations, aircraft must be operated under Visual Meteorological Conditions (VMC) with flight visibility of at least three (3) statute miles visibility and 500 feet below clouds, 1000 feet above clouds, and 2000 feet horizontally from clouds.
- (c) Night flight operations are not authorized.
- (d) The aircraft operator must ensure that a weight and balance calculation is performed prior to each flight, unless a standard load combination is used, and if so, then a weight and balance calculation can be maintained at the start of the operation to ensure that aircraft is within the manufacturers and FAA- established weight and balance limitations.
- (e) The aircraft operator will provide a copy of the FAA Part 133 Operating Certificate to the Field Element prior to start of the project, including proof of liability insurance.



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- (f) The pilot will not operate the aircraft in a careless or reckless manner so as to endanger the life or property of another.
  - (g) The pilot in command of an aircraft is directly responsible for, and is final authority as to, the operation of that aircraft.
  - (h) In an in-flight emergency requiring immediate action the pilot in command, utilizing the skill-of the-craft, may deviate from any rule of 14 CFR Part 91 to the extent required to meet that emergency; and each pilot-in-command who deviates from a Federal Aviation Regulation shall, upon the request of the FAA Administrator, send a written report of that deviation to the FAA Administrator and will notify the DOE as soon as possible.
  - (i) Pilot-in-command will provide a safety briefing to ground and project personnel to include the location and use of fire extinguishers, emergency exits, seat belts and harnesses, if applicable, smoking, internal communications, sterile cockpit procedure will be enforce, and any other pertinent information in the event of an emergency.
  - (j) Daily meetings prior to the start of each day and at the end of each day should be conducted with the flight and ground crews to provide feedback and improvement to ensure safety controls are adequate for the operations being conducted.
  - (k) The CAS vendor engaged in single pilot external load operations will ensure the that a fatigue management system is implemented and the following flight and duty time limitations are implemented while in service to DOE:
    - (1) Duty period: Regardless of the type of work, aerial patrol or external load work, the pilot, mechanic, and crews should be limited to 14 hours of duty within any 24-hour period.
    - (2) Maximum Flight Time: Maximum combined flying hours per 24-hour period (Includes all types of flying) should not exceed eight flight hours.
    - (3) External Load Work Flight Hours or Cycles:

**Note:** Due to the complexity of external load operations, a pilot may be conducting Class A or B load during one period and then conduct a Class C load. It is important for the operator, pilot and customer to understand that a pilot may time- or cycle-out for one type of external operation and still be within limits for another type of operation. The operator and the pilot and should agree before the start of the work which limit is critical to mitigating fatigue related risk in these types of operations.
- (i) Class A and B External Load Operations.

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- 1 If the work environment involves 20 turns or 40 cycles or less per flight hour, no more than 8 hours of flight time should be logged in a 14-hour duty day. (320 total cycles)
      - 2 If the work environment involves 21 turns or 42 cycles to 40 turns or 80 cycles per flight hour, then no more than 6 hours of flight time should be logged in a 14-hour duty day. (322 to 480 total cycles)
      - 3 If the work environment involves 41 turns or 82 cycles to 60 turns or 120 cycles or more per flight hour, then no more than 4 hours of flight time should be logged in a 14-hour duty day. (more than 480 cycles total)
    - (ii) Class C External Load Operations.
      - 1 If the work environment involves wire stringing using “fly-blocks,” then 7 hours of flight time should be logged in a 14-hour duty day.
      - 2 If the work environment involves using a “needle” then no more than 5 hours of flight time should be logged in a 14-hour duty day.
  - (4) Additional Environmental Factors to Consider: In developing administrative controls for a particular task or job, the operators, customers, pilots and crews need to evaluate the following items to determine if the recommendations are adequate or too restrictive:
    - (i) *Terrain* such as mountains or flat land;
    - (ii) *Obstacles* such as heavy timber and/or wire environment;
    - (iii) *Weather* such as clear and light winds or reduced visibility or gusty winds;
    - (iv) *Time of year* summer or winter; and
    - (v) *Previous experience* of the pilot and crew.
  - (5) Other Recommendations to Mitigate the Risk: Establish mandatory rest breaks or provide a relief pilot that shares the workload when conducting external load operations in excess of 40 turns or 80 cycles.
- (1) **Emergency Response Procedures**

- (1) Field Elements will ensure the CAS vendor is briefed and understands the notification procedures for aviation accidents/incidents and that they are considered to be no different than those used for other accidents/incidents at the Field Elements, therefore, in the event of an accident/incident, the Field Element's personnel, contractors, and subcontractors shall follow the established Field Element's emergency action plan. The plan includes notification procedures in the event of an accident.
- (2) The aircraft operator is responsible for notifying the NTSB of accidents and incidents in accordance with 49 CFR Part 830.
- (3) The Field element will ensure that local fire, ambulance, and hospital phone numbers are provided to the aircraft operator and ground crew foreman, and that they are updated as necessary during the project.

**6. Applicable Standards**

Title 14 CFR Part 43

Title 14 CFR Part 61

Title 14 CFR Part 91

Title 14 CFR Part 133

**7. Supplemental Guidance**

HAI Safety Manual

FAA Advisory Circular (AC) 133-1A Rotorcraft External-load Operations in Accordance with Federal Aviation Regulations Part 133

FAA Advisory Circular (AC) 00-1.1 Government Aircraft Operations



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## CHAPTER XI. AERIAL APPLICATIONS (AGRICULTURAL WORK)

1. **Purpose:** The purpose of the Chapter is to standardize flight operations involving aerial applications so that planning efforts, procedures, and evaluations support strict internal controls, safety, cost effective operations, compliance with laws, regulations, policies, and other requirements.
2. **Applicability:** This section contains operational procedures and systems acceptable for Departmental aviation services. The operation of other Government agency aircraft, including those of the Department of Defense (DoD) that are not under DOE operational control, is the responsibility of the respective agency.
3. **General Information**
  - (a) Aerial Applications involve dispensing a solid, liquid, or gas cargo from an aircraft to the ground or ground-based structures. Although DOE-Federal aircraft are not routinely used in aerial applications, it is anticipated that DOE-Federal aircraft may be used to dispense substances to assist in fighting forest fires. This section assumes that DOE-Federal aircraft will dispense only non-poisonous cargo during their applications. These operations should be conducted in accordance with the requirements of 14 CFR Part 137.
  - (b) Flight crewmembers should be trained to perform aerial applications safely and to demonstrate their knowledge and skills in accordance with the requirements of 14 CFR Part 137.19.
  - (c) Aircraft should not carry any person other than flight crewmembers during an aerial application mission.
  - (d) Aircraft modifications required for the aerial application mission should have a Supplemental Type Certificate (STC) or a FAA Form 337 for the modification.
  - (e) Field elements that use Commercial Aviation Service providers to perform aerial applications should use the Chapter on, Commercial Aviation Services of this document for guidance for their operations.
  - (f) The Field element should establish an appropriate and comprehensive training program to address initial, recurrent, and requalification training. The training should be performance based and require initial and recurrent check rides given by a qualified check pilot.
  - (g) The Field element should establish proficiency events appropriate to the operations and missions conducted.

**4. Hazard Assessment**

- (a) Each organization should conduct a pre-mission planning and prior to commencing operations a job hazard assessment for these operations as required by DOE O 440.2B, Section 4, paragraph k. Aviation Safety Documentation.
- (b) All hazards should be mitigated to the lowest level possible to achieve an acceptable risk level given the specific work to be done

**5. Applicable Standards**

Title 14 CFR Part 43

Title 14 CFR Part 61

Title 14 CFR Part 91

Title 14 CFR Part 137

**6. Supplemental Guidance**

FAA Advisory Circular (AC) 137-1 Agricultural Aircraft Operations

FAA Advisory Circular (AC) 00-1.1 Government Aircraft Operations

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## CHAPTER XII. AERIAL SENSING AND PHOTOGRAPHY

1. **Purpose:** The purpose of the Chapter is to standardize flight operations involving aerial sensing and photography (manned or unmanned aircraft) so that planning efforts, procedures, and evaluations support strict internal controls, safety, cost effective operations, compliance with laws, regulations, policies, and other requirements.
2. **Applicability:** This chapter contains operational procedures and systems acceptable for Departmental aviation services. The operation of other Government agency aircraft, including those of the Department of Defense (DoD) that are not under DOE operational control, is the responsibility of the respective agency.
3. **General Information**
  - (a) The DOE aerial sensing and photography operations are extensive and diverse. These types of missions may be as basic as photographing a DOE site from a government aircraft or CAS or as complex as monitoring politically sensitive areas in foreign countries with highly technological instruments. Due to increased security concerns regarding over-flights of DOE facilities during aerial sensing and photography missions, coordination between aircraft operators and site security and in some case the FAA is required to mitigate potential threats.
  - (b) When qualified non-crewmembers, such as DOE or contractor personnel who must be essential to or associated with the aerial sensing or photography work, are onboard the aircraft during aerial sensing and photography missions the requirements of DOE O 440.2B, Field elements aviation implementation plan and the guidance contained in this document must be complied with during the operation.
  - (c) The Field element should establish an appropriate and comprehensive training program to address initial, recurrent, and requalification training. The training should be performance based and require initial and recurrent check rides given by a qualified check pilot.
  - (d) The Field element should establish proficiency events appropriate to the operations and missions conducted.
4. **Hazard Assessment**
  - (a) Each organization should conduct a pre-mission planning and prior to commencing operations a job hazard assessment for these operations as required by DOE O 440.2B, Section 4, paragraph k. Aviation Safety Documentation.
  - (b) All hazards should be mitigated to the lowest level possible to achieve an acceptable risk level given the specific work to be done

**5. Identified Hazards:** The following hazards were identified that require mitigation to manage the risk to acceptable levels. The controls established to manage these risks are found in this Chapter.

- Collision with static wires, guy wires or conductors.
- Collision with other aircraft.
- Collision with cantenary or suspension cables.
- Collision with structures or towers.
- Controlled flight into terrain.
- Engine failure at low altitude.
- Stall and loss of control (fixed wing only).
- Settling with Power (rotorcraft only).
- Loss of Tail Rotor Effectiveness (rotorcraft only).
- Tail rotor failure at low altitude (rotorcraft only).
- Bird Strikes.
- Loss of situational awareness due to sun, low light, or haze.
- Fatigue related stress resulting in “complacency” or “over confidence.”

**6. Understanding Roles and Responsibilities.**

(a) Field Elements or CAS operators:

- (1) Need to ensure the pilot-in-command is briefed on the customer’s request including:
  - (i) Proposed area of photo or survey including known hazards or environmental concerns.
  - (ii) Estimated times,
  - (iii) Number of personnel to be carried,
  - (iv) Any special equipment requirements and weights, and
  - (v) Any other safety related information relevant to the flight.



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- (2) Provide an airworthy aircraft in safe condition and capable for the intended operation.
  - (3) Needs to provide the necessary training or instruction to ensure the pilot-in-command is qualified and proficient in the operations to be conducted.
  - (4) Assign flight crews that are rested.
  - (5) Clearly communicates the conditions that must be met for continued operation and the pilot-in-command is responsible for discontinuing the flight if the conditions cannot be met.
  - (6) Notify the pilot that the pilot and/or the observer has the authority to “call off “the aerial photo or survey at any time the mission presents a problem in terms of safety or the effective conduct of the patrol cannot be resolved while conducting the mission or requires a higher-level personnel involvement.
- (b) Pilot-in-command:
- (1) To pilot the aircraft at all times in a safe manner.
  - (2) Provides a safety briefing before each flight to crewmembers. The pre-flight briefing shall include the following topics:
    - (i) Known flight Hazards and forecast weather;
    - (ii) Coordinates on the planned routes and schedule considering wind conditions, sun, or other factors necessary for the safe completion of the patrol;
    - (iii) Rotor Blades Clearance precautions (rotorcraft only)
    - (iv) Smoking Regulations;
    - (v) Use of Seat Belts and Shoulder Harness;
    - (vi) Passenger Doors used as Emergency Exits;
    - (vii) Location for First Aid/Survival Equipment;
    - (viii) Emergency Procedures-including use of radio-406.0 frequency; and
    - (ix) Operation and Location of Fire Extinguisher;
  - (3) Complies with the instructions of the camera operator or mission crewmember as long as the instruction is consistent with safe operation of

the aircraft and should not distract the camera operator or mission crewmember with an excessive amount of unrelated conversation during the patrol.

- (4) The depth of coverage of each topic should be appropriate to the degree of experience for each crewmember. Special concern should be given to discussion of unusual hazards or other than normal conditions. While the pilot is responsible for the initiation of the briefing, crewmembers are expected to participate as full partners in the review of safety issues.
  - (5) Ensure that the camera or sensor operator is properly secured to the aircraft using an approved attachment means, safety belt, and/or safety harness.
  - (6) Inspects any installed camera or sensor equipment for proper installation and security, except a hand held camera. Camera operators using hand held cameras will be briefed on the use of camera case straps or other means to ensure the hand held camera is not dropped or capable of falling out side of the aircraft during flight.
- (c) Camera or Sensor Equipment Operator.
- (1) Directs the mission by establishing priority for the areas to be flown and notifying the pilot if:
    - (i) The aircraft is not properly positioned to safely or effectively conduct the mission.
    - (ii) The speed of the aircraft is too high (rotorcraft only) for the mission (appropriate airspeed is determined by existing wind conditions, terrain, and visual perception of the observer).
    - (iii) A pass-back is necessary to re-survey or photograph the area (pull up-circle).
    - (iv) Communicate with the pilot if at any time, the camera or sensor operator or observer feels a break is needed or at any time, the observer feels uncomfortable.
  - (2) Attends aviation safety training sessions, both initial and recurrent.
  - (3) During pre-flight briefing, provides the pilot with an update of changes or additions to the area being flown or hazards that have developed along the route since the last mission.

- (4) Complies with the instructions of the pilot-in-command and should not distract the pilot with an excessive amount of unrelated conversation during the patrol.
- (5) Conducts him/herself in a safe and responsible manner while in and around the aircraft.
- (6) Familiarizes him/herself with the area to be flown or surveyed.
- (7) Maintains awareness of hazards that exist along the route.
- (8) Completes written reports of observations for later transfer to the formal record.
- (9) Keeps current work sheets for all areas photograph or surveyed.

**7. Pre-flight/Aerial Photo or Survey.**

- (a) The pilot and camera operator, sensor operator or observer must conduct a preflight briefing prior to each mission to discuss weather, fuel requirements, route of patrol, known or recently identified obstacles, site security notifications and coordination, and noise-sensitive areas. Also, discuss livestock, exotic animals, protected or endangered species, restricted areas, and Temporary Flight Restrictions (TFR) or problem landowners.
- (b) The pilot and observer must work as a team. Prior to each mission, assess the experience level of the team. Make adjustments as necessary to ensure maximum safety. The pilot must be trained and current in the helicopter being flown and the camera operator, sensor operator or observer should be experienced with the cameras or systems.
- (c) The team needs to develop awareness of each member's primary function. It is important that the pilot not become involved in the camera operator, sensor operator or observer's role.
- (d) Review mission conduct to include terminology and procedures for mandatory call-outs and emergency communications. Examples of these may be:
  - (i) CROSSING AHEAD
  - (ii) WIRE
  - (iii) STOP/PROCEED
  - (iv) UP/DOWN
  - (v) IN/OUT

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- (e) For maximum mission efficiency, identify the angle, speed, and distance from the area with the vantage point, and requirements of the camera operator, sensor operator or observer in mind.
  - (f) Review go/no-go criteria as it applies to the patrol. Examples include such limiting factors as:
    - (i) Missions in falling precipitation.
    - (ii) Missions into a rising or setting sun.
    - (iii) Missions in high wind or strong gust spread conditions.
    - (iv) The windscreen must be kept clean. Subsequent cleaning should occur as necessary.
  - (g) Develop and use a flight-following or flight-locating procedure. A FAA plan may be required to be filed in some areas, if not, a VFR flight plan is recommended or flight locating using the organizations procedures.
  - (h) Keep the team size to a minimum. Avoid operations near gross weight or other performance limitations, especially mountainous or congested areas.
  - (i) Consider the use of personal protective equipment and remote area survival equipment as appropriate.
  - (h) Plan routine missions to avoid holiday and weekend activities, particularly in noise-sensitive areas. FLY NEIGHBORLY!
  - (j) Knowing the area and obstacles in the area to be flown is essential to safe operating practices.

## **8. In-flight**

- (a) Do not become complacent. Look for visual cues (e.g., shiny new hardware, new poles, or road development) that may indicate obstacles to flight such as power lines.
- (b) Missions conducted at low altitudes in the wire environment must understand not to expect line crossings to be marked. Be alert for other indications of "over" and "under" line crossings.
- (c) Flight over wires should occur over the top of the structure of the highest-voltage line. This will normally assure passage over the highest wires.
- (d) Make line crossing and obstruction call-outs MANDATORY.

- (e) The aircraft should not be flown any lower than necessary to conduct the mission. If descent below the highest obstacle is required for any reason, speed should be reduced to allow sufficient time to avoid hidden obstacles.
  - (f) The pilot's primary purpose is to fly the helicopter. The pilot should avoid performing the camera or observation functions. Teamwork and development of the Cockpit Resource Management concept should be encouraged between pilots and camera operator, sensor operator or observers at all times.
  - (g) As new obstacles are encountered during a photo or survey mission, note the location on a chart or map for post-flight debriefing and future reference.
  - (h) Flight into a low (rising or setting) sun or haze may reduce the visibility of wires and obstacles due to reflection and glare. Consideration should be given to this condition especially when conducting missions in an unfamiliar area. High recon of the area should be accomplished prior to descending to altitudes that place the aircraft in the wire environment.
  - (i) When terrain conditions warrant, consideration should be given to conducting the patrol on the downhill side of the wire or obstacles. Evaluate wind speed and direction, attempting to patrol into the wind, if possible.
  - (j) Avoid judging distance from a wire or obstacle, particularly stranded wire, based on visual reference to the wire only. The potential for illusions and misjudgment is high, especially in low-light conditions.
  - (k) Hovering and slow flight performance factors (Loss of Tail Rotor Effectiveness and Settling with Power) must be considered when mission requirements dictate low altitude and slow flight operations. Special care should be given to "FLY NEIGHBORLY" practices.
- 9. Post-flight Debriefing:** Upon completion of each mission, the flight team should review the mission just performed and document any new information/obstacles that may be important for future reference.

**10. Applicable Standards**

Title 14 CFR Parts 43, 61, 91, 119, and 135

DOE O 440.2B

FAA Order 8130.34, Airworthiness Certification of Unmanned Aircraft Systems

FAA Interim Operational Approval Guidance 08-01, Unmanned Aircraft Systems

Operations in the U. S. National Airspace System

**11. Supplemental Guidance**

HAI Safety Manual

FAA Advisory Circular (AC) 00-1.1 Government Aircraft Operations

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## CHAPTER XIII. PIPELINE AND POWER LINE PATROL

1. **Purpose:** The purpose of the Chapter is to standardize flight operations involving aerial patrols of pipelines and power lines so that planning efforts, procedures, and evaluations support strict internal controls, safety, cost effective operations, compliance with law, regulations, policies, and other requirements.
2. **Applicability:** This Chapter contains operational procedures and systems acceptable for Departmental aviation services. The operation of other Government agency aircraft, including those of the Department of Defense (DoD) that are not under DOE operational control, is the responsibility of the respective agency.
3. **General Information:**
  - (a) Routine power line and pipeline patrols provide cost effective means of visually inspecting pipelines, electric utility's structures, conductors, and identifying encroachment of manmade or naturally occurring elements that pose hazards to the reliability of the system. In conducting routine power line patrols it must be clearly understood the aircraft is "flying through" the wire environment, which greatly increases the potential for the aircraft to collide with the infrastructure or terrain. This power line patrol requires a minimum crew of an observer and a pilot to effectively and safely perform the work. Pipeline patrols conducted in the southeastern United States can be performed using a single pilot who also acts as the observer using small airplanes effectively and safely.
  - (b) Detailed power line patrols are a recent technique implemented by operators. Unlike routine power line patrols the aircraft is "working in the wire environment" and not flying through the environment. In other words, the aircraft while enroute to the job site is flown at an altitude well above obstacles and upon reaching the work site, transitions to hovering flight at the first structure and then maneuvers at or below translational lift to the next structure to be inspected. The mission crew is generally a pilot, front seat observer and back seat mission crewmember and employs the use of cameras, gyroscopic balanced binoculars, or infrared sensors. Detailed power line patrols require the aircraft to spend extended periods in hovering flight out-of ground effect (OGE) or in slow flight. The aircraft is maneuvered up to the structures at a hover and then both visual observations and sensor recordings are made. The aircraft is then maneuvered to the other side of the structure and up and down the structures to provide a detailed aerial inspection.
  - (c) Transmission lines are susceptible to many problems as a result of weather, age, vandalism, etc. Some problems are more serious than others. Problems should be classified into two categories--primary and secondary.
    - (1) Primary problems are those that may result in an imminent outage or pose a serious threat to the safety and/or welfare of the public. If the damage,

in the observer's view, poses a serious threat, the observer should immediately notify the Utility.

- (2) Secondary problems are those that may not result in an imminent outage and/or not pose a serious threat to the safety or welfare of the public. These problems can be put on an inspection report to rectify at a later date. The observer must use discretion in classifying problems as primary or secondary. Listed below are problems usually considered as primary or secondary:

(i) Primary problems:

- 2 Broken or split cross arms. (May also be secondary)
- 3 Downed or loose conductor.
- 4 Downed or loose static line.
- 5 Severely damaged conductor.
- 6 Severely damaged insulators.
- 7 Foreign material in line (bird nests, wires, shrubs, etc.).
- 8 Lines that cross over and under other lines coming into contact with each other because of ice loading, wind damage, etc.
- 9 Severe structure damage.
- 10 Equipment operation (farm equipment, cranes) under the line not within safe clearances (Note: In cases like these, the helicopter may land so the observer can notify the operator or owner of the hazard.)

(ii) Secondary Problems:

- 1 Loose X-braces.
- 2 Structure damage (leaners caused by farm equipment or animals, burnt wood poles, woodpecker damage).
- 3 .Right-of-way access problems.
- 4 Right-of-way and/or structure erosion.
- 5 Loose or damaged guy wires (May also be primary).



- 6 Loose or damaged structure ground wires.
- 7 Loose or damaged dampers.
- 8 Loose or missing hardware.
- 9 Missing or faded structure numbers

(3) Many other problems may exist on or around the transmission line. Care should be taken by the aerial observer not to overlook major problems by looking for less significant problems. Smaller, less significant problems will normally be identified during the routine ground patrol of the transmission line. Discussion with line crew supervisors and observers may identify problems other than those listed above and the appropriate responses to them. Again, common sense and care in response to these problems are important.

(d) **Emergency Patrols:** These patrols normally occur after a circuit has had an operation (or fault). The objective of this type of patrol is to quickly ascertain the cause of the operation, the location of the cause, and access for crews to repair the problem.

(e) **Detailed line inspections:** These inspections occur for the purpose of identifying everything wrong with a particular circuit. All items of the system are closely viewed in close proximity by the naked eye and with the aid of high-powered gyro-stabilized binoculars. All defects are noted, photographed, and reported in an acceptable format to the utility. Detailed Inspections require that the helicopter be flown at a much slower speed and normally just above conductor height to be able to detect conductor or shield wire damage. Stops at each structure are made to inspect with the binoculars the status and condition of each component. Discrepancies are noted and normally photographs are taken to clarify the reported discrepancy.

**4. Identified Hazards:** The following hazards were identified that require mitigation to manage the risk to acceptable levels. The controls established to manage these risks are found in this Chapter.

- Collision with static wires, guy wires or conductors.
- Collision with other aircraft.
- Cantenary or suspension cables.
- Collision with structures or towers.
- Controlled flight into terrain.

- Engine failure at low altitude.
- Settling with Power.
- Loss of Tail Rotor Effectiveness.
- Tail rotor failure at low altitude.
- Bird Strikes.
- Loss of situational awareness due to sun, low light, or haze.
- Fatigue related stress resulting in “complacency” or “over confidence.”

## 5. Electric Utility Systems and Patrol Procedures

- (a) General. Develop a working knowledge and a basic understanding of the transmission system facilities is necessary so that the worker understands the reason for work methods employed and to avoid the hazards that are present at the work site. In addition, it provides a pilot and crewmember the ability to forecast where to expect wires rather than total reliance on visual contact with the wire itself. It is important to recognize that electric utility systems are not static, they are dynamic and constantly changing so pilots and crewmen need to maintain vigilance even on systems they may have become familiar.
- (b) Knowledge of Transmission Facilities
  - (1) Circuit Voltage: Crews need to know how to identify the circuit being worked and its voltage, by use of various aids such as geographical circuit prints, insulation design, proper marking by circuit signs and/or structure markings [OSHA 1910.269(l) or other regulatory authority, NESC Part 4, IEEE Std 516] to avoid potential electrical shock.
  - (2) Structures: The worker needs to have a basic knowledge of various transmission structures including:
    - (i) Lattice types;
    - (ii) Steel poles types;
    - (iii) Wood pole; and
    - (iv) Composite and concrete poles.
  - (3) Types of Insulators: Pilots and crews need to have knowledge of various types of insulators, including:
    - (i) Ceramic suspension;

- (ii) Ceramic post;
  - (iii) Glass; and
  - (iv) Non-ceramic (NCI).
- (4) According to the "National Electric Safety Code," higher-voltage lines SHOULD cross over the top of lower-voltage lines. It is an imperative for the pilot and crewmembers to know what voltage is being patrolled in order to know what to expect above and below the line.
- (c) When patrolling an unfamiliar system or for the first time:
  - (1) Begin with the highest voltage in the system. This provides the ability to observe wire crossings from the top down.
  - (2) To enhance the quality and safety of the patrol, the pilot or observer must be familiar with the system being patrolled. There should never be a circumstance that a pilot and observer be dispatched to perform a patrol when neither is familiar with the system. Prior to commencing work the pilot and observer must be briefed using maps, system photos, and other information necessary to perform the patrol safely.
  - (3) The pilot must concentrate on flying the aircraft that includes obstacle avoidance such as identification of wire crossings, antennae, and sensitive areas while providing the observer the best view possible to safely inspect the line. Observer emphasis should focus on developing aerial observation skills and techniques rather than achieving quality, thorough inspection. The pilot and observer should strive to work as a team.
  - (4) The likelihood of seeing a wire in time to take evasive action is much greater at slower airspeeds. Keep it slow.
- (d) The lower the voltage of the lines being patrolled, the more skills will be required. The greater complexity of the lower-voltage systems increases the patrol workload.
- (e) Field Elements that use Federal or hire CAS aircraft should prepare, maintain and provide current circuit maps, diagrams, and/or digital information on new lines and construction projects.
- (f) Power Administrations should develop a program for marking power lines, wire crossings, and identifying hazards to flight on the mapping resources provide.

## **6. Understanding Roles and Responsibilities (Power Line Patrols).**

- (a) Field Elements or CAS operators:

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- (1) Need to ensure the pilot-in-command is briefed on the customer's request including:
    - (i) Proposed patrol routes and type of structures (230 kV, 69 Kv, Oil or Gas Pipeline, etc.),
    - (ii) Estimated times,
    - (iii) Number of personnel to be carried,
    - (iv) Any special equipment requirements and weights, and
    - (v) Any other safety related information relevant to the flight.
  - (2) Provide an airworthy aircraft in safe condition and capable for the intended operation.
  - (3) Needs to provide the necessary training or instruction to ensure the pilot-in-command is qualified and proficient in the operations to be conducted.
  - (4) Assign flight crews that are rested.
  - (5) Clearly communicates the conditions that must be met for continued operation and the pilot-in-command is responsible for discontinuing the flight if the conditions cannot be met.
  - (6) Notify the pilot that the pilot and/or the observer has the authority to "call off" the aerial patrol at any time the patrol presents a problem in terms of safety or the effective conduct of the patrol cannot be resolved while conducting the patrol or requires a higher-level personnel involvement.
- (b) Pilot-in-command:
- (1) To pilot the aircraft at all times in a safe manner.
  - (2) Provides a safety briefing before each flight to Crewmembers. The pre-flight briefing shall include the following topics:
    - (i) Known flight Hazards and forecast weather;
    - (ii) Coordinates on the planned routes and schedule considering wind conditions, sun, or other factors necessary for the safe completion of the patrol;
    - (iii) Rotor Blades Clearance precautions;
    - (iv) Smoking Regulations;

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- (v) Use of Seat Belts and Shoulder Harness;
  - (vi) Passenger Doors used as Emergency Exits;
  - (vii) Location for First Aid/Survival Equipment;
  - (viii) Emergency Procedures-including use of radio-406.0 frequency;  
and
  - (ix) Operation and Location of Fire Extinguisher
- (3) Complies with the instructions of the patrol observer as long as the instruction is consistent with safe operation of the aircraft and should not distract the observer with an excessive amount of unrelated conversation during the patrol.
  - (4) The depth of coverage of each topic should be appropriate to the degree of experience for each Crewmember. Special concern should be given to discussion of unusual hazards or other than normal conditions. While the pilot is responsible for the initiation of the briefing, Crewmembers are expected to participate as full partners in the review of safety issues.
  - (5) Ensure that the camera or sensor operator is properly secured to the aircraft using an approved attachment means, safety belt, and/or safety harness.
  - (6) Inspects any installed camera or sensor equipment for proper installation and security, except a hand held camera. Camera operators using hand held cameras will be briefed on the use of camera case straps or other means to ensure the hand held camera is not dropped or capable of falling out side of the aircraft during flight.
- (c) Patrol Observer, Camera or Sensor Equipment Operator.
    - (1) Directs the patrol by establishing priority for the lines to be patrolled and notifying the pilot if:
      - (v) The aircraft is not properly positioned to safely or effectively view the transmission line.
      - (vi) The speed of the aircraft is too high for proper patrol.  
(Appropriate airspeed is determined by existing wind conditions, terrain, and visual perception of the observer.)
      - (vii) A pass-back is necessary to inspect a specific structure (pull up-circle).

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- (viii) Communicate with the pilot if at any time, the observer feels a break is needed or at any time, the observer feels uncomfortable.
  - (10) Attends aviation safety training sessions, both initial and recurrent.
  - (11) During pre-flight briefing, provides the pilot with a transmission line update of changes or additions to the transmission line system or hazards that have developed along the route since the last patrol.
  - (12) Complies with the instructions of the pilot-in-command and should not distract the pilot with an excessive amount of unrelated conversation during the patrol.
  - (13) Conducts him/herself in a safe and responsible manner while in and around the aircraft.
  - (14) Familiarizes him/herself with the transmission lines to be patrolled.
  - (15) Maintains awareness of hazards that exist along the patrol route.
  - (16) Observes and records damage to structures, insulators, hardware, conductors, and other equipment; and observes conditions on or bordering the right-of-ways, including encroachments, dangerous trees, access roads, brush, slides, erosion, etc.
  - (17) When appropriate, inspects questionable situations by requesting to land, if safely possible, and observing from the ground.
  - (18) Analyzes defects observed and determines whether they require routine or emergency maintenance.
  - (19) Makes recommendations to effect immediate repairs to transmission system in emergencies.
  - (20) Ensures that reports of emergencies are reported to the Utility, power dispatcher or responsible supervisor.
  - (21) Completes written reports of observations for later transfer to the formal record.
  - (22) Keeps current work sheets for all transmission lines patrolled.

## **7. Pre-flight/Patrol Conduct (Power Line Patrols)**

- (a) The pilot and observer must conduct a preflight briefing prior to each patrol to discuss weather, fuel requirements, route of patrol, known or recently identified obstacles, site security notifications and coordination, and noise-sensitive areas.

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Also, discuss livestock, exotic animals, protected or endangered species, restricted areas, and Temporary Flight Restrictions (TFR) or problem landowners.

- (b) The pilot and observer must work as a team. Prior to each patrol, assess the experience level of the patrol team. Make adjustments as necessary to ensure maximum safety. The pilot must be trained and current in the helicopter being flown and the observer should be experienced with the system being patrolled.
- (c) The patrol team needs to develop awareness of each member's primary function. It is important that the pilot not become involved in the observer's role.
- (d) Review patrol conduct to include terminology and procedures for mandatory call-outs and emergency communications. Examples of these may be:
  - (i) CROSSING AHEAD
  - (ii) WIRE
  - (iii) STOP/PROCEED
  - (iv) UP/DOWN
  - (v) IN/OUT
- (e) For maximum patrol efficiency, identify the angle, speed, and distance from the wires and structures with the vantage point, and requirements of the observer in mind.
- (f) Review go/no-go criteria as it applies to the patrol. Examples include such limiting factors as:
  - (i) Routine patrols in falling precipitation.
  - (ii) Patrolling into a rising or setting sun.
  - (iii) Patrolling in high wind or strong gust spread conditions.
  - (iv) The windscreen must be kept clean. Subsequent cleaning should occur as necessary.
- (g) Develop and use a flight-following or flight-locating procedure. A FAA plan may be required to be filed in some areas, if not, a VFR flight plan is recommended or flight locating using the dispatch center.
- (h) Keep the patrol team size to a minimum. Avoid operations near gross weight or other performance limitations, especially on subtransmission voltage patrols.

- (i) Consider the use of personal protective equipment and remote area survival equipment as appropriate.
- (h) Plan routine patrols to avoid holiday and weekend activities, particularly in noise-sensitive areas. FLY NEIGHBORLY!
- (j) Knowing the voltage of the circuit you are patrolling and the electrical distance to maintain between the conductors and ground is essential to safe operating practices.

## **8. In-flight**

- (a) Do not become complacent. Look for visual cues (e.g., shiny new hardware, new poles, or road development) that may indicate changes occurring in the system.
- (b) Do not expect line crossings to be marked. Be alert for other indications of "over" and "under" line crossings.
- (c) Flight over wires should occur over the top of the structure of the highest-voltage line. This will normally assure passage over the highest wires.
- (d) Make line crossing and obstruction call-outs MANDATORY.
- (e) The helicopter should be flown with the skids (wheels) above the highest wire on the structures being patrolled. If descent below the highest wire is required for any reason, speed should be reduced to allow sufficient time to avoid hidden obstacles.
- (f) The pilot's primary purpose is to fly the helicopter. The pilot should avoid performing the patrol observation function. Teamwork and development of the Cockpit Resource Management concept should be encouraged between pilots and observers at all times.
- (g) As new obstacles are encountered during a patrol, note the location on a chart or map for post-flight debriefing and future reference.
- (h) Flight into a low (rising or setting) sun or haze may reduce the visibility of wires due to reflection and glare. Consideration should be given to this condition especially when patrolling an unfamiliar system.
- (i) When terrain conditions warrant, consideration should be given to conducting the patrol on the downhill side of the wires. Evaluate wind speed and direction, attempting to patrol into the wind, if possible.
- (j) Avoid judging distance from a wire, particularly stranded wire, based on visual reference to the wire only. The potential for illusions and misjudgment is high, especially in low-light conditions.



- (k) Hovering and slow flight performance factors (Loss of Tail Rotor Effectiveness and Settling with Power) must be considered when patrol requirements dictate close observation of the system. Special care should be given to "FLY NEIGHBORLY" practices.

**9. Post-flight Debriefing:** Upon completion of each patrol, the flight team should review the patrol just performed and document any new information/obstacles that may be important for future reference.

**10. Pipeline System Patrol Procedures:** Most of the pipeline patrol work in the DOE is to support the Strategic Petroleum Reserve. The work is accomplished using single engine airplanes operated by a single pilot, who also performs the observer duties. The recommendations are based on the following.

- (a) Develop a working knowledge of how the pipeline system is constructed and markings. This will provide the ability to forecast where to expect wire crossings and other flight hazards rather than total reliance on visual contact with them.
- (b) When patrolling an unfamiliar pipeline system or for the first time:
  - (i) Consider conducting a high reconnaissance of a patrol segment. This provides the ability to observe wire crossings and other hazards from the top down.
  - (ii) To enhance the quality and safety of the patrol, either the pilot, camera or sensor operator or observer must be familiar with the system being patrolled. If this is not possible, then prior to commencing work the pilot and crew (observer and camera or sensor operator) need to be briefed using maps, system photos, and other information necessary to perform the patrol safely.
  - (iii) The pilot must concentrate on flying the aircraft that includes obstacle avoidance such as identification of wire crossings, antennae, and sensitive areas while providing the observer the best view possible to safely inspect the pipeline and right of way. Observer emphasis should focus on developing aerial observation skills and techniques to provide a thorough inspection. The pilot and observer should strive to work as a team.
  - (iv) The likelihood of seeing a wire in time to take evasive action is much greater at lower airspeeds. Keep it slow.
- (c) Contour following flights at lower altitudes for sensor use and/or patrolling pipelines with smaller right of ways will require more skill. The higher likelihood of flying through the wire environment increases the patrol workload. This is especially true in hilly or mountainous terrain where wires may be suspended across valleys on the intended flight path.

- (d) The pipeline company shall provide current system maps and/or information of new pipelines and construction projects. Digital mapping that can be displayed for the flight crew is preferred.
- (e) Work with the pipeline company in the development of a program for marking power lines, wire crossings, and identifying hazards to flight on the mapping resources provide. Remember that electric utilities are not the only organizations that may install wire hazards.

#### 11. Roles and Responsibilities.

##### (a) Operators:

- (i) Need to ensure the pilot-in-command is briefed on the customer's request including:
  - 1 Proposed patrol routes and type of equipment on-board (sensor or camera) and equipment limitations,
  - 2 Estimated times,
  - 3 Number of personnel to be on-board,
  - 4 Any special equipment requirements and weights, and
  - 5 Any other safety related information relevant to the flight.
- (ii) Provide an airworthy aircraft in safe condition and capable for the intended operation.
- (iii) Provide the necessary training or instruction to ensure the pilot-in-command is qualified and proficient in the operations to be conducted.
- (iv) Assign flight crews that are rested.
- (v) Clearly communicates the conditions that need to be met for continued operation and the pilot-in-command is responsible for discontinuing the flight if the conditions cannot be met.
- (vi) Notify the pilot and observer has the authority to call off the aerial patrol at any time the patrol presents a problem in terms of safety or the effective conduct of the patrol that cannot be resolved while conducting the patrol or requires a higher-level personnel involvement.

##### (b) Pilot-in-command:

- (i) To pilot the aircraft at all times in a safe manner.

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- (ii) Provides a safety briefing before each flight to Crewmembers. The pre-flight briefing shall include the following topics:
    - 1 Known flight Hazards and forecast weather.
    - 2 Coordinates on the planned routes and schedule considering wind conditions, sun, or other factors necessary for the safe completion of the patrol.
    - 3 Rotor Blades Clearance precautions.
    - 4 Smoking policies.
    - 5 Use of Seat Belts and Shoulder Harness.
    - 6 Passenger Doors used as Emergency Exits.
    - 7 Location for First Aid/Survival Equipment.
    - 8 Emergency Procedures - including use of radio-460.0 frequency.
    - 9 Operation and Location of Fire Extinguisher.
    - 10 Required PPE for the flight such as fire retardant flight suits, helmets, etc.
  - (iii) Complies with the instructions of the patrol observer, camera/sensor operator, as long as the instruction is consistent with safe operation of the aircraft, and should not distract the observer with an excessive amount of unrelated conversation during the patrol.
  - (iv) The depth of coverage of each topic should be appropriate to the degree of experience for each Crewmember. Special concern should be given to discussion of unusual hazards or other than normal conditions. While the pilot is responsible for the initiation of the briefing, Crewmembers are expected to participate as full partners in the review of safety issues.
- (c) Patrol Observer, Camera or Sensor Equipment Operator.
- (i) Directs the patrol by establishing priority for the pipelines to be patrolled and notifying the pilot if:
    - 1 The aircraft is not properly positioned to safely and effectively view or film the pipeline.
    - 2 The speed of the aircraft is too high for proper patrol.  
(Appropriate airspeed is determined by existing wind conditions, terrain, and visual perception of the observer.)

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- 3 A pass-back is necessary to inspect a specific area of the pipeline (pull up-circle).
  - 4 Communicate with the pilot if at any time, the observer or sensor/camera operator feels a break is needed or at any time, the observer or sensor/camera operator feels uncomfortable.
- (ii) Attends aviation safety training sessions, both initial and recurrent.
  - (iv) During pre-flight briefing, provides the pilot with a pipeline update of changes or additions to the pipeline right-of-way including transmission line crossings or hazards that have developed along the route since the last patrol.
  - (v) Complies with the instructions of the pilot-in-command and should not distract the pilot with an excessive amount of unrelated conversation during the patrol.
  - (vi) Conducts him/herself in a safe and responsible manner while in and around the aircraft.
  - (vii) Familiarizes him/herself with the pipeline to be patrolled.
  - (viii) Maintains awareness of hazards that exist along the patrol route.
  - (ix) Observes and records conditions of the pipeline right-of-way, signs of leakage, or landslides, erosion, etc.
  - (x) When appropriate, makes inspections of questionable situations by requesting to land, if possible and observing from the ground.
  - (xi) Analyzes defects observed and determines whether they require routine or emergency maintenance.
  - (xii) Ensures that reports of emergency situations are reported to the Utility, dispatcher or responsible supervisor.
  - (xiii) Completes written inspection reports of observations, submits film or data for processing, for later transfer to the formal record.
  - (xiv) Keeps current work sheets for all pipelines patrolled.

## 12. Preflight/Patrol Conduct (Pipeline Patrol)

- (a) The pilot and observer must conduct a preflight briefing prior to each patrol to discuss weather, fuel requirements, route of patrol, known or recently identified obstacles, site security notifications and coordination, and noise-sensitive areas.

Also, discuss livestock, exotic animals, protected or endangered species, restricted areas, and Temporary Flight Restrictions (TFR) or problem landowners.

- (b) The pilot, observer, sensor/camera operator need to work as a team. Prior to each patrol, assess the experience level of the patrol team. Make adjustments as necessary to ensure maximum safety. The pilot should be trained and current in the helicopter being flown and the observer should be experienced with the system being patrolled.
- (c) The patrol team should develop awareness of each member's primary function. It is important that the pilot not become involved in the observer's role.
- (d) Review patrol conduct to include terminology and procedures for mandatory call-outs and emergency communications. Examples of these may be:
  - (i) CROSSING AHEAD
  - (ii) WIRE
  - (iii) STOP/PROCEED
  - (iv) UP/DOWN
  - (v) IN/OUT
- (e) For maximum patrol efficiency, identify the angle, speed, and distance from the pipeline with the vantage point, and requirements of the observer or sensor/camera operator in mind.
- (f) Review go/no-go criteria as it applies to the patrol. Examples include such limiting factors as:
  - (i) Routine patrols in falling precipitation.
  - (ii) Patrolling into a rising or setting sun.
  - (iii) Patrolling in high wind or strong gust spread conditions.
- (g) The windscreen must be kept clean. Subsequent cleaning should occur as necessary.
- (h) Develop and use a flight-following or flight-locating procedure. A Civil Aviation Authority flight plan may be required to be filed in some countries, if not, a VFR flight plan is recommended.
- (i) Keep the patrol team size to a minimum. Avoid operations near gross weight or other performance limitations, especially on contour following patrols in areas with steep terrain.

- (j) Consider the use of personal protective equipment and remote area survival equipment as appropriate.
- (k) Plan routine patrols to avoid holiday and weekend activities, particularly in noise-sensitive areas. FLY NEIGHBORLY!

### **13. In-flight (Pipeline Patrols)**

- (a) Do not become complacent. Look for visual cues (e.g., shiny new hardware, new poles, or road development) that may indicate changes that have created wire-crossing hazards along the pipeline right of way.
- (b) Along pipeline right-of-ways generally power line crossings are not marked. Be alert for indications of wires nearby such as cleared canopy in the forest, towers, etc. Do not forget that most power lines will have static wires above the conductors that are usually more difficult to see and can be a significant distance above the conductor at mid-span.
- (c) Flight over wires should occur over the top of the structure of the highest-voltage line. This will normally assure passage over the highest wires, the static wires, avoid collision.
- (d) Make power line crossing and obstruction call-outs MANDATORY.
- (e) The pilot's primary purpose is to fly the helicopter. The pilot should avoid performing the patrol observation function. Teamwork and development of the Cockpit Resource Management concept should be encouraged between pilots and observers at all times.
- (f) As new obstacles are encountered during a patrol, note the location on a chart or map for post flight debriefing and future reference to update the patrol mapping resources.
- (g) Flight into a low (rising or setting) sun may reduce the visibility of wires due to reflection and glare. Consideration should be given to this condition especially when patrolling an unfamiliar pipeline system.
- (h) When terrain conditions warrant, consideration should be given to conducting the pipeline patrol on the downhill side of the wires that may be parallel to the pipeline right of way. Evaluate wind speed and direction, attempting to patrol into the wind, if possible.
- (i) Hovering and slow flight performance factors (Loss of Tail Rotor Effectiveness and Settling with Power), must be considered when patrol requirements dictate close observation of the pipeline system component. Special care should be given to "FLY NEIGHBORLY" practices.

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- (j) Do not become too focused on patrol sensor malfunctions. If the system is not operating properly, place the helicopter at a safe altitude and orbit while correcting the problem. Make sure the pilot remains focused on flying the helicopter. Make a landing in an appropriate safe location if detailed troubleshooting of the equipment is needed.
- 14. Post-flight Debriefing (Pipeline Patrol).** Upon completion of each patrol, the flight team should review the patrol just performed and document any new information/obstacles that may be important for future reference.
- 15. Flight Time.** Total flight time for patrolling should not exceed 5 hours per day, except in emergencies. The 5-hour period is for patrol time only and does not include ferry time nor limit the pilot from other types of flying. Procedures should be established as part of a comprehensive fatigue management system for extending past the 5-hour limit, if necessary; however, if for any reason one of the crewmembers does not want to continue the patrol past 5 hours, the patrol should be stopped.
- 16. VFR Operating Limitations and Weather Requirements.** The following list of operating limitations and weather requirements should be complied with during power line or pipeline patrol.
- (a) All patrols should be restricted to Day/VFR conditions.
- (b) VFR: Minimum Altitudes (14 CFR Chapter 1, Part 91 Section 91.119).
- (i) Helicopters. An altitude allowing, if a power unit fails, an emergency landing without presenting undue hazards to persons or property on the surface. In addition, each person operating a helicopter should comply with any routes or altitudes specifically prescribed for helicopters by the FAA Administrator.
- (ii) Airplanes. An altitude allowing, if a power unit fails, an emergency landing without presenting undue hazards to persons or property on the surface. The aircraft operator should obtain an authorization from the FAA to conduct operations within 500 feet of any structure or obstacle (A waiver from 14 CFR Part 91.119).
- (c) VFR: Visibility Requirements Helicopters [14 CFR part 135.205] No person may operate a helicopter under VFR in Class G airspace at an altitude of 1,200 feet or less above the surface or within the lateral boundaries of the surface areas of Class B, Class C, Class D, or Class E airspace designated for an airport unless the visibility is at least one-half (1/2) mile during the day.
- (i) Visibility. The following is a list of hazards that may affect pilot and qualified non-crewmember visibility and must be considered during power line or pipeline patrol:

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- 1 Sky Conditions. Pilots should plan pipeline or power line patrols flying away from the sun (sun to the pilots back). If this is not possible or practical, then the use of special equipment such as sunglasses, sun visors, sun bills, or a combination of these, should be used to decrease the glare of the sun.
  - 2 Inclement Weather. During inclement weather conditions, the pilot should comply with the 14 CFR minimum visibility requirements given above. If during the patrol the visibility drops below minimums, the pilot should inform the dispatcher of his/her intentions. The ground patrol speed should be adjusted to accommodate inclement weather conditions.
- (d) VFR: Fuel Supply [14 CFR Part 135.209] No person may begin a flight operation in a helicopter under VFR unless, considering wind and forecast weather conditions, it has enough fuel to fly to the first point of intended landing. Assuming normal cruising fuel consumption, a helicopter must have enough fuel to remain airborne an additional 20 minutes, and an airplane must have enough fuel to remain airborne at least 30 minutes during the day and 45 minutes at night.
- (e) Weather Reports and Forecasts: Pilots are required to use a weather report or forecast that is provided by the U.S. National Weather Service, a source approved by the U.S. National Weather Service, or a source approved by the FAA Administrator. However, for operations under VFR, the pilot-in-command may, if such a report is not available, use weather information based on that pilot's own observations or on those of other persons competent to supply appropriate observations.
- (f) Weather Considerations:
- (i) Wind. Pilots should plan pipeline and power line patrol flights, when possible, using a head wind. The following is a list of techniques that should be considered when patrolling during windy conditions.
  - (ii) Crabbing/Slipping. Crabbing into the wind should take precedence over slipping into the wind. However, slipping should take precedence over crabbing if the crab angle points the nose of the aircraft away from the line being patrolled. In some cases, patrolling on the opposite side of the line may be the best choice (pilot's decision).
  - (iii) The normal patrol speed in order to maintain the rotor disc in translational lift. This should prevent loss of tail rotor effectiveness and/or settling with power, or prevent airplane stalls. If excess ground speed is a problem because of the tail wind component and no other options are available, the pilot should call off the patrol.



- (iv) **Downwind Turns.** Low-level downwind turns (turning from upwind to downwind) can be deceiving. During calm wind conditions, translational lift airspeed and translational lift ground speed look the same. However, with a wind factor involved, translational lift airspeed and translational lift ground speed look different. A consideration of the wind factor is critical when making a low-level downwind turn (turning from upwind to downwind). When circling pipeline or power line structures during the patrol, the pilot must consider the wind factor, remember that stall ground speed will be faster, and look faster during the downwind leg. If the pilot uses the same ground reference speed during windy conditions as is used during calm wind conditions, the helicopter will not be in translational lift during the turn (upwind to downwind). Maintaining situational awareness is crucial in windy conditions.

- 17. Patrol Conduct.** Under routine patrol, patrol flights should be conducted at speeds, altitudes, and distances that afford the qualified non-crewmember the best opportunity to thoroughly inspect the pipeline and power line right-of-way, and that are commensurate with safe flight practices. The following guidelines should apply:
- (a) **Patrol Speeds.** Patrol speeds should normally be conducted at 30-70 knots indicated airspeed per hour for helicopters, or at speeds at least 1.3 above stall speed (VSO) for airplanes.
  - (b) **Terrain.** Flat terrain will accommodate patrolling with higher ground speeds than will rugged or mountainous terrain.
  - (c) **Clearance.** During routine pipeline or power line patrols the aircraft should be flown at a safe distance determined by local policy. Crewmember comfort, difference in terrain, weather conditions, sky condition, timber growth, visibility of structures, etc., should dictate actual aircraft clearance. However, it is understood that a pilot should never patrol below power lines.
  - (d) **Patrol Flight Technique.** The aircraft pilot will maintain sufficient clearance by referencing cross arms or structures down line rather than referencing conductors. This provides the qualified non-crewmember the best possible site picture while providing a safe margin of clearance for the aircraft.
  - (e) **Parallel Lines.** The aircraft will not be flown between two parallel pipeline or power lines without adequate spacing for an emergency landing.
  - (f) **Passback.** Occasionally, the qualified non-crewmember will require a better look at a structure or pumping station for damage or perhaps to observe the structure or station number and will request the pilot to make a passback. When this happens, the pilot may have to consider the following options:
    - (i) **Hovering.** When hovering is necessary, the pilot will maintain a safe distance from the conductor and static line. Hovering under a conductor is

not permitted. However, if hovering the helicopter for the purpose of observing structure numbers turns out to be a frequent occurrence, then renumbering the pipeline or power line structures should be a consideration.

- (ii) **Circling.** When circling a structure, the pilot will fly the aircraft at an airspeed above stall speed or translational lift, and at an altitude to allow clearance over the pipeline or power line and to permit an emergency landing away from the line.

**NOTE:** Pilots should not be deceived into thinking that ground speed and airspeed are the same during the downwind part of the turn. Remember, translational lift equates to airspeed, not ground speed.

- 18. Landing.** If the qualified non-crewmember has trouble observing the damage or seeing the structure number while the helicopter is hovering, the option is to land the helicopter, get out, and walk over to the area to be observed. If landing or hovering the helicopter for the purpose of observing structure numbers turns out to be a frequent occurrence, then renumbering the pipeline or power line structures should be a consideration.
- 19. Hazard Maps and Location List.** A site-specific hazard map and location list should be developed to indicate where ground patrols will be performed in lieu of aerial patrols because of specific flight hazards (dams, canyons, congested pipeline or power line areas, restricted areas, etc.) The hazard map and location list should include all hazards along the patrol routes.
- 20. Dispatcher Communication.** Dispatcher communication should be established and the initial flight plan should be filed prior to pipeline or power line patrol. A separate flight plan should be filed for each pipeline or segment or local area route.
- 21. Flight Locating/Emergency Procedures Handbook.** Qualified non-crewmembers should be on the distribution list and should receive a copy of the Area/District site-specific Handbook for reporting overdue aircraft. The qualified non-crewmembers can use this handbook as a study guide to become familiar with the procedures used by the local dispatcher if their patrol aircraft is overdue for any reason during aerial pipeline or power line patrol. Patrol aircraft should be maintained to 14 CFR Part 135, Subpart J.

## **22. APPLICABLE STANDARDS**

Title 14 CFR Part 91

Title 14 CFR Part 135 Subparts C through H, and J

## **23. SUPPLEMENTAL GUIDANCE DOCUMENTS**

HAI Safety Manual, Section on Utilities, Patrol and Construction Guide

FAA Advisory Circular (AC) 00-1.1 Government Aircraft Operations

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## CHAPTER XIV. SECURITY HELICOPTER OPERATION

1. **Purpose.** The purpose of the Chapter is to standardize security helicopter flight operations so that planning efforts, procedures, and evaluations support strict internal controls, safety, cost effective operations, compliance with laws, regulations, policies, and other requirements.
2. **Applicability.** This section contains operational procedures and systems acceptable for Departmental aviation services. The operation of other government agency aircraft, including those of the Department of Defense (DoD) that are not under DOE operational control, is the responsibility of the respective agency.
3. **General Information.** Security helicopter flight operations provide a timely and effective response to a security emergency. DOE security helicopters may be used for response force transport, as a firing platform when required, and to perform command, control, communications, and surveillance functions. Operational requirements, rules of engagement, night vision goggles usage, instrument/visual flight rules, and organizational requirements are discussed in the following items. Also, refer to Chapters VII, VIII and IX of this guide.
4. **Operational Requirements**
  - (a) **General.** Helicopters employed in support of security provide an airborne dimension to protective capabilities against a threat posed by adversaries who may attempt to steal or sabotage nuclear weapons, special nuclear materials, and/or sabotage vital facilities and equipment. The decision to utilize security helicopters is based upon site-specific considerations with concurrences of the Program manager, if any, and the Office of Aviation Management. Security helicopters are operated as “public” aircraft and in accordance with the applicable Federal Aviation Regulations (FAR) for flight operations, equipment, flight and qualified non-crewmember qualification, training and maintenance to the maximum extent possible.
  - (b) **Mission Readiness.** Site-specific mission requirements of security helicopters should be documented in local operations plans. Mission Capable Rate goals should be determined by the Field element [DOE O 440.2B and DOE G 440.2B-1].
  - (c) **Emergency Security Helicopter Operations.** During a security emergency, helicopters may be employed to transport special response teams to the scene of the incident or staging area as directed by the senior on-scene commander or standard operating procedure. Additional emergency response functions should be fully documented and may include the removal or relocation of response forces; directed fire; command, control, communications and surveillance; resupply of response forces, fresh pursuit for law enforcement actions and the

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pursuit and recovery of Special Nuclear Materials as mandated from the Graded Security Protection (GSP) Policy, DOE O 470.3B.

- (d) Routine Security Helicopter Operations may include:
  - (1) Pilot proficiency, training, and testing program.
  - (2) Training for emergency response.
  - (3) Site surveillance, search and observation.
  - (4) Movement of protective forces.
  - (5) Training for observation and pursuit of airborne and ground intruders.
  - (6) Escort of convoys transporting special nuclear material.
  - (7) Command, control and communications of ground security activities in routine operations.
- (e) Special Use of Security Helicopters should be included in site policies and approval processes.
- (f) Visual Flight Rules Operations Plan: A designated individual at each site, in coordination with the site DOE ASO, Contractor Aviation Manager/Director of Flight Operations, and DOE Field element Safeguards and Security Director, should provide to the Head of the DOE Field element a visual flight rules minimum operations plan based on the site terrain and weather patterns. This plan should address:
  - (1) The minimum weather conditions under which airborne response can be launched for day and night operations.
  - (2) Transition to a no-air support reaction condition.
  - (3) Altitude Considerations.
  - (4) Routine Training and Operations.
- (g) Daylight Operations: Aircraft should maintain a minimum altitude of 200 feet above any known obstacle within 500 feet either side of the planned route of flight during daylight operations except for takeoff, approach, and landing.
- (h) Night and Night Vision Goggle Operations: Except for takeoff, approach and landing, aircraft should maintain a minimum altitude of 500 feet above ground level or 200 feet above the highest obstacle within 1,000 feet either side of the planned flight route, whichever is higher. When using night vision goggles, aircraft should maintain a minimum altitude of 300 feet above ground level or 200

feet above the highest obstacle within 1,000 feet of the planned route of flight, whichever is higher. See Chapter VIII for recommended equipment requirements.

- (i) **Hazard Mapping:** Each aircraft should have available to the pilot a map displaying all identifiable hazards to flight within the operating area. A map displaying all identifiable hazards to flight and depicting elevation above ground level should be conspicuously posted in the mission planning area. Aircraft maps and mission planning area maps should be reviewed for currency at least every 30 days and marked with the current date.
- (j) **Terrain Flight (Nap of the Earth, Contour and Low Level):** There are three modes of terrain flight: contour, low level, and nap of the earth. Terrain flight is flight at 200 feet or less above the highest obstacle on the intended flight path. Terrain flight and night vision device/goggle flight are essential to DOE tactical and security needs. Low level or contour flight may provide a tactical advantage in a security emergency. Nap of the earth flight is not essential to the Department's security needs and should not be performed. Contour flight conforms to the contours of the earth and is characterized by varying airspeeds and altitudes. Contour flight altitudes are not less than 25 feet above the highest obstacle. Low-level flight is not less than 100 feet above the highest obstacle. It is conducted at a selected altitude and generally conforms to a predetermined course, with constant airspeed. Nap of the earth flight is characterized by maneuvers, as close to the earth's surface as vegetation, obstacles, or ambient light will permit.

## **5. Training Route(s)/Areas**

- (a) Low level and contour flight for training and proficiency should be conducted only over designated training routes or in designated training areas.
- (b) A low-level flight route/area for training should be developed at each site. The training route(s)/area should be clear of hazardous obstacles. The training route(s)/area and associated altitude minimums should be approved by each site DOE ASO, Contractor Aviation Manager/Director of Flight Operations, and the Field element Safeguards and Security Director.
- (c) The training route(s)/area(s) should be clearly marked on each aircraft map and mission-planning map. A master map showing all hazards to flight should be conspicuously displayed for the flight crew's use.

## **6. Pilot Training**

- (a) Pilot initial training, qualification, requalification, proficiency, and currency training should be conducted in accordance with applicable requirements of 14 CFR parts 61 and 135, and this guide Chapter VII.

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- (b) Only the instructor pilot and pilot(s) should be permitted on board the helicopter during any pilot training unless the response team is required to be on board during a specific training scenario, such as crew coordination training or night low-level insertions.
7. **Crewmember Coordination:** The pilot-in-command should ensure that routine mission training and tactical activities involving both flight and qualified non-crewmembers are fully briefed and coordinated.
8. **Use of Helicopters as Firing Platforms and Rules of Engagement:** The primary purpose for security helicopter flight operations is to provide timely and effective aerial response to a security incident. Firing from a helicopter can be a viable and effective means of supporting security operations, and the site-specific Aviation Implementation Plan AIP may incorporate aerial firing under the following conditions:
- (a) Authority to include aerial firing in response plans must be granted only following development of site-specific rules of engagement that are consistent with DOE policy on the use of force.
- (b) Firing must be done only by specifically trained and qualified SRT personnel with weapons attached to gun mounts that provide field-of-fire limitations which protect the aircraft from self-inflicted damage.
- (c) A Safety Analysis Review (SAR) of aerial firing must be completed. The SAR must be reviewed for currency any time aerial firing requirements are changed, but at least every 12 months.
- (d) The technical and operational procedures and SAR for aerial firing must be submitted in writing to the cognizant DOE safety officer for approval.
- (e) DOE line management is the final approval authority at each site. Copies of the approved technical and operational procedures for aerial firing must be provided to the Senior DOE Aviation Management Official; the cognizant Departmental element or the Administrator, NNSA; and the Office of Health, Safety and Security.
- (f) Contractor site-specific aerial firing qualification and/or familiarization courses must be developed and submitted, through the DOE cognizant security authority to the Chief Health, Safety and Security Officer for review and approval.
9. **Night Vision Goggles:** Operation, maintenance, testing, and calibration of night vision goggles used by protective forces flight crew and designated aircrew members should conform to the manufacturer's current procedures and specifications, or equivalent standards.
- (a) Operations: In all stages of night vision goggle training and use, two pilots are required. Pilots using night vision goggle devices should be FAA instrument

rated and current in the rating. Pilots are required to follow specified procedures in operating night vision goggles. Procedures contained in the Manufacturer's operating instructions should be followed. Exceptions may only be approved by the site Aviation Manager in coordination with the Office of Aviation Management.

- (1) Night vision goggle operational checks should be accomplished prior to official sunset. These checks should be documented on the pilot's Flight Operations Daily Checklist.
- (2) Any discrepancy noted during operational checks should be recorded on the night vision goggle/visor maintenance log, to include the correct goggle serial number.
- (3) Each pilot-in-command is responsible for ensuring that his or her aircrew night vision goggles are checked in accordance with the manufacturer's maintenance manual or Army TM 11-5855-263-10.
- (4) During qualification training with night vision goggles, one of the pilots should be designated a night vision goggle trainer and a FAA Certified Flight Instructor. Only the pilot and instructor pilot should be permitted on board the helicopter.
- (5) After initial night vision goggle training has been completed, minimum night vision goggle currency flight time requirements and proficiency checkrides, should be met as approved by the site DOE AvM or ASO and Contractor Aviation Manager/Director of Flight Operations, and coordinated with the DOE Field element Safeguards and Security Director.
- (6) Response team members may be carried for site patrols, tactical training, and security emergency operations only when both pilots are fully night vision goggle qualified and current. Any locally required crew use of night vision goggles should be based upon local guidelines and procedures, which should include pilot/crew coordination and training. Such crew use of night vision goggles should optimize 360-degree observation from the aircraft.
- (7) Aircraft that are used for night vision goggle flight should have the minimum standard night vision goggle equipment as follows:
  - (i) Night vision goggle-compatible cockpit;
  - (ii) Night vision goggle compatible digital/analog radar altimeter with visual and audible warnings;

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- (iii) Wire strike protection, if FAA approved for use on the make and model of aircraft;
  - (iv) Night sun with infrared filter; and/or
  - (v) Wire detection system (if applicable).
- (b) A Night Vision Goggle Maintenance Program should be instituted. Such a program should include standardized maintenance practices and equipment, a standard operating procedure, regular maintenance schedules, a records management system with permanent records, standard maintenance training, and standard pilot preflight procedure training.
- (1) NVG Maintenance
- (i) Maintenance technicians should follow procedures contained in the manufacturer's maintenance manual, the program must meet the requirements in 14 CFR parts 43, 91, and RTCA/DO-275.
  - (ii) Night vision goggle testing and repair should be conducted only by a FAA certified Airframe and Powerplant mechanic who has completed the manufacturer's vision goggle maintenance course or a FAA certified Repair Station authorized to conduct such repairs.
  - (iii) Test equipment used on the night vision goggles should meet the manufacturer's specifications or RTCA/DO-275 specifications and should be calibrated according to those specifications.
  - (iv) Mandatory testing and maintenance should be at intervals no less frequent than that specified by the manufacturer or in RTCA/DO-275.
  - (v) Night vision goggle maintenance logs should be checked at the beginning of each shift. Discrepancies should be cleared and noted on the night vision goggle maintenance log and the goggles returned to service with an appropriate serviceability tag. All record entries will comply with 14 CFR parts 43 and 91.
- (c) **Instrument Flight Rules/Visual Flight Rules Flight:** There are no requirements for intentional flight into instrument meteorological conditions in the conduct of a security mission other than the recovery capability in the event of inadvertent instrument meteorological conditions. The aircraft should have the equipment required under 14 CFR Chapter 1, part 135, §135.143, §135.149, §135.159, §135.161, and Pilot instrument proficiency should be part of a local flight training syllabus.



**10. APPLICABLE STANDARDS**

Title 14 CFR Chapter 1

RTCA/DO-275

DOE O 440.2B

DOE M 470.4-3 Chg 1, Protective Force

DOE O 470.3B



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## CHAPTER XV. AVIATION MAINTENANCE

1. **Purpose.** The purpose of this Chapter is to ensure that an adequate maintenance standards (manned and unmanned aircraft) and quality control processes exist for an effective, efficient, secure and safe aviation operation.
2. **Applicability.** This Chapter contains maintenance procedures and systems acceptable for Departmental aviation services. The maintenance of other Government agency aircraft, including those of the Department of Defense (DoD) that are not under DOE operational control, is the responsibility of the respective agency.
3. **General.** DOE Field element managers should ensure that the assigned Aviation Manager or Aviation Safety Officer and crews are cognizant of the requirements for DOE-Federal aircraft to be maintained and airworthy and that quality control processes are implemented to ensure safety. The maintenance guidance provided in this Chapter is intended to provide DOE/NNSA elements and contractors latitude in compliance methods. DOE Field elements should use this guidance for implementing aircraft maintenance programs. Methods should be established for evaluating contractor maintenance programs for compliance with 14 CFR parts 21, 43, and 91. If applicable, methods should be established for evaluating contractor maintenance programs for compliance with 14 CFR parts 121 and 135.
4. **Methods for Compliance with 14 CFR §91.409.**
  - (a) Aircraft that are type certificated for a passenger seating configuration, excluding any pilot seat, of nine (9) passenger seats or less should be maintained in accordance with 14 CFR Chapter 1, parts 43, 91, and 135 §135.41 1(a) (1); or, if a Departmental element chooses to maintain aircraft under §135.411(b), it may do so, provided the program is submitted to the Office of Aviation Management or the local FAA FSDO for approval.
  - (b) Aircraft that are type certificated for a passenger seating configuration, excluding any pilot seat, of (10) passenger seats or more, and conducting other than air-carrier operations, should be maintained in accordance with 14 CFR part 135 §135.41 h (a) (2).
  - (c) Aircraft that are type certificated for a passenger seating configuration, excluding any pilot seat, of (10) passenger seats or more, and conducting scheduled air carrier operations, should be maintained in accordance with 14 CFR Part 121, Subparts J, L, and V.
  - (d) Aircraft operating that have a passenger-seating configuration of twenty (20) passenger seats or a maximum payload capacity of 6,000 pounds or more when common carriage is not involved, or operations not certificated under 14 CFR parts 121, 129, 135, or 137, should be maintained in accordance with 14 CFR part 125, Subparts O and L.

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- (e) Tier 3, 4, and 5 unmanned aircraft that have no type certification should be maintained in accordance with the manufacturer's maintenance instructions. If no instructions were developed or provided by the manufacturer, then 14 CFR part 43, Appendices A, B and D should be used as a guide to develop a maintenance program for Tier 3, 4, and 5 unmanned aircraft.
  - (f) Tier 1 and 2 unmanned aircraft that have no type certification should be maintained in accordance with the manufacturer's maintenance instructions.
  - (g) Bailed, surplus, or leased military aircraft should be maintained in accordance with an accepted FAA maintenance and inspection program approved in accordance with 14 CFR §91.409(g).
  - (h) Rotorcraft operating under 14 CFR part 133 should comply with the airworthiness requirements of 14 CFR parts 43, 91, and 133.
  - (i) Elements with maintenance facilities located at a DOE facility or with contracted maintenance/inspection operations should adhere to 14 CFR Part 145, or 14 CFR Part 121, Subparts Land V.
  - (j) A training and recurrent training program for maintenance personnel and maintenance specialists should be established, see Chapter VII of this guide.
  - (k) The Aviation Program Manager and Director of Maintenance are responsible for:
    - (1) Ensuring the aircraft is maintained properly and a quality control process is established during the performance of maintenance.
    - (2) Ensuring that maintenance technicians and repairmen are trained in the type aircraft, engine, propeller, and/or system the technician or repairman is required to maintain.
    - (3) Ensuring that maintenance technicians and repairmen are trained in the applicable FAR, company operations manual, and maintenance procedures manual (if applicable).
    - (4) Ensuring that specialized training (nondestructive testing, avionics, painting, electrical, etc.) is made available and the technician and repairman have received recurrent training within the preceding 12 months.
    - (5) Ensuring records of formal and on-the-job training are to be kept on file and current. As a minimum, the records should include the following
      - (i) Employee's name and license number;
      - (ii) Assignment date;

- (iii) Employee's maintenance specialty;
- (iv) Types of aircraft, propellers, engines, and/or systems on which the employee is qualified to work;
- (v) Factory or formal training, and date;
- (vi) Duty time;
- (vii) Recurrent training due date; and
- (viii) Drug testing, including the last test date and results.

**5. Qualifications/Responsibilities.** The Aviation Manager or Aviation Safety Officer, who has responsibility for DOE-Federal aircraft, should ensure that the organization has qualified maintenance personnel and that they are adequately trained or obtain maintenance from certificated 14 CFR part 145 Repair Stations.

**6. Commercial Aviation Service (CAS).** CAS (Chartered, rented, and/or leased aircraft) operations should adhere to the applicable parts and sections of 14 CFR Chapter 1 and the operations specifications issued by the FAA.

**7. DOE-Federal Aircraft (manned and unmanned aircraft)**

- (a) DOE-Federal aircraft maintenance programs approved under 14 CFR §135.411(a)
  - (1) should have the following procedures incorporated into their programs.
    - (1) Tool calibration, serviceability, and inventory tracking procedures;
    - (2) Parts acceptance and rejection procedure;
    - (3) Inspection authorities and procedures for maintenance work accomplished by maintenance technicians and repairmen;
    - (4) Methods of disseminating, approving, and submitting changes to the maintenance/inspection program;
    - (5) Computerized tracking procedures for retirement life parts, overhauls, inspections, airworthiness directives, and service bulletins;
    - (6) Aircraft parts procurement and procedures for vendor audits for other than original equipment manufactured parts;
    - (7) Inoperative Instruments, Equipment, and Minimum Equipment List (MEL); and

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- (8) DOE-Federal aircraft maintenance/inspection programs managers should address the requirements of 14 CFR parts §91.213, §121.628, and §135.179, as applicable.
- 8. Quality Control Processes.** Each Field element that operates DOE-Federal aircraft (manned or unmanned) should establish Quality Control processes that implement DOE O 440.2B, Section 4, paragraph h. (a) 7.
- 9. Standardized Cost Accounting.** Each Field element that operates DOE-Federal aircraft should establish a standardized cost accounting system for the reporting of maintenance cost and expenditures.
- (a) The cost accounting system should use the cost definitions established in the GSA Cost Accounting Guide.
- (b) The maintenance cost and expenditures should be reported to the GSA Federal Aviation Interactive Reporting System (FAIRS).
- 10. Performance Indicators.** Each Field element that operates DOE-Federal aircraft should establish information systems that implement the guidance found in DOE G 440.2-1, Aviation Performance Indicators for the maintenance and supply (Logistics) processes. Examples include:
- (a) Aircraft Availability Rates
- (b) Aircraft Non-availability Rates
- (c) Non-airworthy Maintenance Rates
- (d) Non-airworthy Supply Rates

For a complete list of Aviation Performance indicators see DOE G 440.2-1.

- 11. Life Cycle Cost.** Each Field element should establish cost accounting methods in order to conduct Life Cycle Cost Analysis. The standardized cost accounting system should enable the Field element to determine the cost effectiveness of the aircraft the element operates. This program should be utilized as a tool for managers to decide when an aging aircraft needs replacement or refurbishment and for conducting Exhibit 300 Business case studies required by DOE O 440.2 and OMB Circular A-11.

**12. APPLICABLE STANDARDS**

Title 14 CFR parts 21,43,65,91, 121, 125, 133, 135, and 145

Title 49 CFR parts 172, 175, and 830

DOE O 440.2B

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DoD-HBK-516B, Airworthiness Certification Criteria

FAA Order 8130.34, Airworthiness Certification of Unmanned Aircraft Systems

FAA Interim Operational Approval Guidance 08-01, Unmanned Aircraft Systems  
Operations in the U. S. National Airspace System

RTCA DO-178B, DO- 248B, and DO-278

**13. SUPPLEMENTAL GUIDANCE**

FAA Advisory Circular (AC) 00-1.1 Government Aircraft Operations

FAA AC 120-1 6C Continuous Airworthiness Maintenance Programs

FAA AC 120-17A Maintenance Control by Reliability Methods

FAA AC 120-72 Maintenance Resource Management Training

FAA AC 121-16 Maintenance Certification Procedures

FAA AC 135-7 FAR 135: Additional Maintenance Requirements for Aircraft Type  
Certificated for Nine or less Passenger Seats

FAA AC 135-10A Subject: Approved Aircraft Inspection Program

DOE G 440.2B, Chapter 25





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## CHAPTER XVI. AVIATION POLICY DOCUMENTS AND MANUALS

1. **Purpose.** The purpose of the Chapter is to state the basic recommendations for developing, communicating, and standardizing aviation procedures and policy documents and manuals applicable to DOE Field elements.
2. **Applicability.** This Chapter contains operational procedures and systems acceptable for Departmental aviation services (manned or unmanned) and Federal or other government agency aircraft, including those of the Department of Defense (DoD), that are operated to or from DOE owned or managed property under local agreement. The operation of other Government agency aircraft, including those of the Department of Defense (DoD) that is not in service or under DOE operational control or operating to or from DOE owned or managed property, is the responsibility of the respective agency.
3. **General Information.**
  - (a) Each DOE program or field element that has management responsibility for (1) assigned Federal aircraft (see Attachment 3, Definitions) or (2) uses commercial aviation services (CAS; see Attachment 3, Definitions) must develop and publish an aviation implementation plan detailing the standards, operating parameters, airworthiness criteria, security procedures and safety systems of its planned aviation operations. As a minimum, the AIP will address all applicable requirements of this Order and other related requirements established by DOE policy [DOE O 440.2B Section 4 paragraph (a)].
  - (b) The AIP can be a local order, process document, or other requirements style document that implements the appropriate DOE O 440.2B requirements for the size and scope of operations. However, for DOE elements that own and operate Federal aircraft the organization must develop written procedures, processes, or requirements applicable to the operations and type of aircraft in use. [DOE O 440.2B Section 4 paragraph (h)]
  - (c) The following paragraphs provide guidance and details on the type of contents that should be developed to comply with the Order. In other cases, references to regulations or FAA circulars will provide the detail to meet the intent of the Order.
4. **Airports owned or controlled by DOE elements.**
  - (a) Title 14 CFR part §139.205 should be used as a guide for the preparation of airport operations and maintenance manuals.
  - (b) The following FAA Advisory Circulars (AC) provides additional guidance:
    - (1) AC 150/5345-12E Specification for Airport and Heliport Beacons;
    - (2) AC 150/5320-6D CHG 2 Airport Pavement Design and Evaluation; and

- (3) AC 150/5210-20 Ground Vehicle Operations on Airports.

**5. Reporting Obstructions to Airways and Other Flight Hazards.**

- (a) Field elements engaged in construction or decommissioning of DOE facilities should establish policies on the notification to the FAA of any installation or removal of obstructions that may pose or may have posed a hazard to air navigation.
- (b) The field element's policies should be consistent with the requirements established in 14 CFR parts 77 and 157.
- (c) Field element's polices should include notification and coordination with the Office of Aviation Management.

**6. Heliports or Helistops owned, maintained or controlled by DOE elements.**

- (a) There are no FAA regulations that specifically address Heliports or Helistops therefore the following FAA AC should be used as a guide for the preparation of establishment, maintenance, or management of these facilities:
- (1) AC 150/5345-12E Specification for Airport and Heliport Beacons;
- (2) AC 150/5390-2B Heliport Design; and
- (3) AC 150/5210-20 Ground Vehicle Operations on Airports.

**7. Operations of Balloons owned, controlled or operated by DOE elements.**

- (a) Field elements that own, control or operate balloons should establish policies on the notification to the FAA and be consistent with the requirements established in 14 CFR part 101.
- (c) Field element's polices should include notification and coordination with the Office of Aviation Management.

**8. Aircraft Maintenance Facilities.**

- (a) For DOE Field elements with operations similar to FAA certified Part 145 Repair Stations (maintenance repair facilities) should comply with applicable sections of the 14 CFR part 145.
- (b) The following FAA Advisory Circulars (AC) provide additional guidance:
- (1) AC 145-9 Guide for Developing and Evaluating Repair Station and Quality Control Manuals;
- (2) AC 145-10 Repair Station Training Program;

- (3) AC 65-24 Certification of a Repairman (General);
- (4) AC 145-5 Repair Station Internal Evaluation Programs; and
- (5) AC 145-8A Acceptance of Repair Stations by the Joint Aviation Authority (JAA) and JAA-Member National Aviation Authorities (NAAs) Under the Maintenance Implementation Procedures of a Bilateral Aviation Safety Agreement.

## **9. Aircraft Operations Manuals**

- (a) Each DOE Field element and contractor conducting DOE aviation operations involving DOE-Federal aircraft should have aviation procedures manuals formatted and similar to operations and airworthiness manuals required by 14 CFR parts 121, 125, 133, and/or 135. In accordance with the requirements section of DOE O 440.2B, the policy documents or manuals will include as a minimum the methods and procedures for complying with the requirements of DOE O 440.2B, applicable to the scope of operations and types of aircraft in use.
- (b) Aviation policy documents or manuals addressing 14 CFR parts 121, 125, or 135 operations and maintenance as a minimum should contain the sections required by 14 CFR parts 121 Subpart G, §121.369, 125 Subpart C, §125.249, §133.47, §135.21, and §135.427, as appropriate. If the aviation operation involves aircraft under ten (10) passengers then the manual should include the requirements established in §135.21 and should have separate sections for “Operations,” “Training,” “Security,” and “Maintenance.”
- (c) Elements conducting special types of operations, described in 14 CFR parts 133 and 137 should refer to Chapters X and XI of this guide, respectively.
- (d) DOE-Federal aircraft operators may choose to provide in the operation procedure documents or manuals the following as appendices:
  - (1) Documentation demonstrating compliance with 14 CFR parts 91, 121, 125, 133, 135, 137, 139, or 145, as applicable;
  - (2) Documentation supporting exemptions referenced in a FAA Compliance Statement; and
  - (3) Documentation supporting exemptions from DOE O 440.2B but not related to 14 CFR parts 91, 121, 133, 135, 137, 139, or 145.
- (e) The Heads of the DOE Field elements and the Power Marketing Administrations (PMA), or their designees, should concur and endorse the aviation policy documents or manual(s), subsequent changes to the documents or manual(s), and document such endorsement. Any changes to FAA approved or accepted manuals must be coordinated with the FAA.

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**10. Contents of Flight Operations Manuals.** It is recommended that DOE-Federal aircraft Flight Operations Manuals should contain the following elements, if applicable:

- (a) Record of Revisions
- (b) Introduction
- (c) General
  - (1) Purpose of the Flight Program
  - (2) Authorization
  - (3) Regulatory Authority
  - (4) Area of Operation
- (d) Aviation Operations Manual
  - (1) Purpose of the Manual
  - (2) Responsibilities
  - (3) Implementation
  - (4) Revision System
  - (5) Revision and Change Process
- (e) Management
  - (1) Management Qualifications and Duties
    - (i) Aviation Manager
    - (ii) Director of Operations
    - (iii) Chief Pilot
    - (iv) Director of Maintenance
    - (v) Safety Officer
    - (vi) Aircraft Quality Assurance Administrator
- (f) Personnel Qualifications and Duties

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- (1) Pilot-In-Command
    - (i) Qualifications
    - (ii) Duties and Responsibilities
  - (2) Second-In-Command
    - (i) Qualifications
    - (ii) Duties and Responsibilities
  - (3) Instructor Pilot
    - (i) Qualifications
    - (ii) Duties and Responsibilities
  - (4) Aircraft Mechanic
    - (i) Qualifications
    - (ii) Duties and Responsibilities
  - (5) Crewmembers (Cabin safety, Load masters, etc.) Other Than Pilots
    - (i) Qualifications
    - (ii) Duties and Responsibilities
  - (6) Qualified Non-crewmembers (Patrol observers, sensor operators, etc.)
    - (i) Qualifications
    - (ii) Duties and Responsibilities
  - (7) Parts/Supply Clerk
    - (i) Qualifications
    - (ii) Duties and Responsibilities
  - (8) Administrative Assistant
    - (i) Qualifications
    - (ii) Duties and Responsibilities
  - (g) Personnel Policies and Procedures

- (1) General
  - (2) Definition
  - (3) Personal Health and Limitations
  - (4) Smoking Policy
  - (5) Flight Restrictions
  - (6) Restrictions after Use of Drugs
  - (7) Restrictions after Use of Alcohol
  - (8) Restrictions after Blood Donation
  - (9) Restrictions after Dives or Chamber Runs
  - (10) Employee reporting and safety program
  - (11) Access to Pilot Compartment
  - (12) Personal Protective Equipment (PPE) and Appearance
- (h) Flight Operations Procedures
- (1) Policy
  - (2) General
  - (3) Operational Control
  - (4) Flight Following
  - (5) Restricted Activities and Maneuvers
  - (6) Severe Weather Actions
  - (7) Emergency Reporting
  - (8) Headset and Helmet Procedures
  - (9) Cellular Telephone Procedures
  - (10) Mission and Resource Assignments
  - (11) Mission Assignment
  - (12) Aircraft Assignment

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- (13) Crew Assignment
  - (14) Preflight Actions
    - (i) Flight Planning
    - (ii) Weather Minimums
    - (iii) Fuel Planning
    - (iv) Visual Check
    - (v) Removal of ice or frost on Aircraft
  - (15) Passenger Rules
  - (16) Briefing of Passengers/Crewmembers
  - (17) Use of Checklists and Documents
  - (18) Personnel/Passenger Manifests
  - (19) Ground Operations
    - (i) Engine Starting Procedure
    - (ii) Crewmember Vigilance
    - (iii) Taxiing
    - (iv) Before Takeoff Procedures
  - (20) Takeoff and Climb
    - (i) Takeoff Performance And Limits
    - (ii) Engine Failure Procedures
    - (iii) Climb Restrictions
    - (iv) Altitude Actions
  - (21) Level Flight/Cruise
    - (i) Oxygen Mask Fit
    - (ii) Oxygen Mask Use
  - (22) Descent

- (i) Special Considerations
  - (ii) Required Call
- (23) Approach And Landing
  - (i) Crewmember Vigilance
  - (ii) After Landing Checks
- (24) Taxiing And Parking
  - (i) Taxiing Precautions
  - (ii) Parking
- (25) Installing and Removing Mission Equipment
- (26) Non-Routine Flights (Mission assessment and hazard indemnification)
- (i) International and Extended Overwater Flight
  - (1) General
  - (2) Definitions
  - (3) Pilot-in-command Responsibilities
  - (4) Flight Rules
  - (5) Planning
  - (6) International Operations
  - (7) Flight Planning and Information Sources
  - (8) Precautions (security)
  - (9) Notifications, Approvals, and Fees
  - (10) Regulations
  - (11) Documentation
  - (12) Fuel
  - (13) Aircraft Maintenance away from base
  - (14) Security Considerations



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- (15) General Help (State Department, OAM, DoD)
  - (16) Extended Overwater Operations
  - (17) Emergency Actions
  - (18) Ditching And Emergency (Survival) Equipment
  - (j) Weight and Balance
    - (1) Definitions
      - (i) Aircraft Empty Weight
      - (ii) Basic Operating Weight (Bow)
      - (iii) Landing Weight
      - (iv) Record of Aircraft Weighing
      - (v) Takeoff Weight
      - (vi) Weight and Balance Record
    - (2) Responsibilities
      - (i) Director of Maintenance
      - (ii) Pilot-in-command
      - (iii) Quality Administrator
      - (iv) Personnel Installing Mission Equipment in the Aircraft
    - (3) Record of Aircraft Weighing
      - (i) Adjustments Without Weighing the Aircraft
      - (ii) Weighing the Aircraft Every 36 Months
      - (iii) Weighing the Aircraft When Deemed Necessary
    - (4) Information for Computing Takeoff Weight and Balance
      - (i) Use Most Accurate Method
      - (ii) Method of Weight Verification
    - (5) Verification of Computer Computation

- (k) Flight Locating
  - (1) Responsibilities
  - (2) Pilot-in-command
  - (3) Individual Designated to Flight Follow (Field element)
  - (4) Mission Task Leader
- (l) Emergency Procedures
  - (1) General Procedures
  - (2) In-Flight Emergency
  - (3) General
  - (4) Emergency Crew Assignments
  - (5) Distress Urgency Communications
  - (6) Obtaining Emergency Assistance
  - (7) Communication Failure
  - (8) Engine Failure Notification
  - (9) Continuing Flight in Unsafe Conditions
  - (10) Hijack Procedure
  - (11) Bomb Threat Procedure
- (m) Accident / Incident Procedures
  - (1) Purpose
  - (2) General Procedures
  - (3) Notification and Reporting Procedures (NTSB, DOE, and OAM)
  - (4) Investigations
  - (5) Accident/Incident Scene Security
- (n) Maintenance
  - (1) General Maintenance Practices

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- (2) Maintenance Criteria
  - (3) Foreign Object Damage (FOD) Prevention and Tool Control Programs
  - (4) Maintenance Records
  - (5) Maintenance of Aircraft
  - (6) Returning Aircraft to Service
  - (7) Minimum Equipment List, Deferred Discrepancies, and Tracking
  - (8) General
  - (9) Inspection
  - (10) Inspection System (Procedures for critical item inspections)
  - (11) Quality Control Program
  - (12) Scheduled Inspections
  - (13) Special Inspections
  - (14) Spot Inspections
  - (15) Test and Post Maintenance Flights
  - (16) Pilot-In-Command Responsibilities
  - (17) Reporting Aircraft Discrepancies
  - (18) Implementing Aviation Performance Indicators and Tracking
- (o) Aircraft Servicing Procedures
- (1) General
  - (2) Servicing of Aircraft
  - (3) Fueling/Defueling
  - (4) Stored Fuel (Environmental and Quality monitoring)
  - (5) Fuel Sampling Requirements
  - (6) Oil and Oxygen Servicing
  - (7) Payment of Services

- (p) Flight/Duty Time Limits and Rest Requirements
  - (1) General
  - (2) Definitions
  - (3) Flight Time Limits
  - (4) Duty Time limits
  - (5) Crew Rest Requirements
  - (6) Fatigue Management System (Refer to NTSB Recommendation Letter A-08-44 and -45, June 12, 2008)
  
- (q) Scheduling
  - (1) Scheduling Procedures
  - (2) General
  - (3) Mission/Survey/Patrol/ Etc. Schedule
  - (4) Annual Flying Hour Program
  - (5) Weekly Flight and Standby Schedule
  - (6) Aviation Services Section Daily Operations Report
  - (7) Mission Plans
    - (i) General
    - (ii) Format
  - (8) Aviation Resource Scheduling
    - (i) General
    - (ii) Technical Coordinator
    - (iii) Director of Operations Responsibilities
    - (iv) Chief Pilot Responsibilities
    - (v) Chief of Maintenance Responsibilities
    - (vi) Crewmember Responsibilities

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- (vii) Administrative, Flight Dispatchers, and Secretary Responsibilities
  - (r) Hazardous Materials
    - (1) General Information
    - (2) Objective
    - (3) Policy
      - (i) Use of DOE Special Permits
      - (ii) Application and Requests for exemptions (DOE and DOT)
    - (4) Applicability
    - (5) Cargo Aircraft Only
    - (6) Hazardous Materials Accident or Incident
    - (7) Pilot-in-command Responsibilities
    - (8) Identifying Hazardous Materials
    - (9) Hazardous Material Table
    - (10) General Safety Requirements
      - (i) Limiting Exposures
    - (11) Exceptions for Packaging
      - (i) Batteries/Battery Fluids
      - (ii) General Information
      - (iii) Requirements
      - (iv) Compressed Gas
      - (v) Liquid Helium and Nitrogen
      - (vi) Gasoline
    - (12) Shipping Papers
    - (13) Accepting and Inspecting Shipments

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- (14) Reporting Requirements For Accidents, Incidents, and In-Flight Emergencies
  - (15) Training
  - (s) Flight Safety Program
    - (1) Management Responsibilities (Line Management Responsibility and Clear Roles and Responsibilities)
      - (i) Aviation Manager
      - (ii) Aviation Safety Officer
      - (iii) Director of Flight Operations, Chief Pilot, and Chief of Maintenance
      - (iv) Pilots
      - (v) Mechanics
      - (vi) Flight Dispatchers, Administrative Assistance, etc.
    - (2) Safety Culture - General
    - (3) Integrated Safety Management
      - (i) Processes and procedures for ensuring personnel have the competence commensurate with their responsibilities.
      - (ii) Processes and procedures to ensure the mission work is defined.
      - (iii) Methods and practices to ensure management will balance the priorities between mission accomplishment, safety and cost effectiveness.
      - (iv) Processes used to identify hazards associated with the missions.
      - (v) Processes or methodologies to analyze the hazards.
      - (vi) Processes or methodologies used to identify Safety Standards and develop and implement controls to mitigate hazards.
      - (vii) Processes or methodologies used to tailor hazard controls to work and ensuring work is performed within controls and standards.

- (viii) Processes to ensure all involved understand operation authorization and stop work authority.
- (ix) Processes or systems used to collect feedback to ensure continuous improvement and validation of controls.
- (4) Safety Awards and Employee Recognition Program
- (5) Aviation Safety Reporting Program (DOE, FAA, NTSB, and Organizational)
  - (i) Hazard Alerts
  - (ii) Malfunction Defect Reporting
  - (iii) Disseminating Safety Related information
- (6) Safety Education and Awareness
- (7) Safety Training

**11. Policy on the Use of DOE Managed Restricted Airspace.**

Each Field element that manages Restricted Airspace should establish protocols and procedures for the operation and use of that airspace for unmanned aircraft activity.

**12. APPLICABLE STANDARDS**

Title 14 CFR Chapter 1

Title 41 CFR part 102-33

Title 48 CFR part 970.5223

DOE P 450.4

DOE M 450.4-1

DOE O 440.2B

**13. Supplemental Guidance**

DOE Guide 450.4-1 V1

DOE Guide 450.4-1 V2

DOE Handbook 3027-99

HAI Safety Manual





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## CHAPTER XVII. USE OF GOVERNMENT AIRCRAFT FOR OTHER OFFICIAL TRAVEL

1. **Purpose.** The purpose of this chapter is to ensure that an adequate framework exists for establishing processes for the justification, approval and use of Government aircraft for official travel, that is not mission travel, and to prevent the abuse of DOE Federal aircraft.
2. **Applicability.** This chapter contains operational procedures and methodologies acceptable for Departmental aviation services. The operation of other Government agency aircraft, including those of the Department of Defense (DoD) that are not under DOE operational control, is the responsibility of the respective agency. The following paragraphs provide recommendations to implement DOE's approval process for use of government aircraft as required by OMB Circulars A-123 and A-126, provides guidance for the implementation of DOE O 440.2B and 41 CFR parts 101-37, 300-3, 301-10, 301-70.
3. **General.** Agencies are required to establish internal controls to assure appropriate internal controls for aviation management are implemented and part of the agency's control plan. Use of government aircraft for travel within the DOE are diverse and used every day to support the DOE's activities. It is important to understand the different terms, travel categories and types of travelers who use government aircraft.
  - (a) Definitions of travel.
    - (1) Official Travel includes:
      - (i) Travel to meet mission needs (mission travel);
      - (ii) Required Use travel; and
      - (iii) Other official travel.
    - (2) Mission travel means travel to support the discharge of an agency's official responsibilities such as convoy support, emergency evacuation, emergency response or exercises to support National Security missions, aerial patrol, aerial survey, security response team insertion and extraction, atmospheric measurement, etc. To meet the requirements of mission travel the travelers (persons) on-board must be essential to or directly associated with the government function for which the aircraft was dispatched. [49 U.S.C. §40102 (41) and §41025 (a)] However, mission travel does not include transportation of persons from point A to B to attend training not associated with duties on-board an aircraft, to attend meetings or conferences, to give speeches, or to make routine site visits.

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- (3) Required Use Travel means travel by Federal travelers that requires use of a Government aircraft to meet bona fide communications needs (e.g., 24-hour secure communications), security requirements (e.g., highly unusual circumstances that present a clear and present danger), or exceptional scheduling requirements (e.g., a national emergency or other compelling operational considerations) of an executive agency.
  - (4) Space Available Travel means travel when space is available on a Government aircraft that is already scheduled for mission travel or a official purpose.
  - (5) Other Official Travel means travel to attend training not associated with duties on-board an aircraft, to attend meetings or conferences, to give speeches, or to make routine site visits.
- (b) Other Pertinent Definitions.
- (1) Federal Traveler means a person who travels on a Government aircraft and who is either—
    - (i) A civilian employee in the Government service;
    - (ii) A member of the uniformed or foreign services of the United States Government; or
    - (iii) A contractor working under a contract with an executive agency.
  - (2) Non-federal Traveler means an individual who travels on a Government aircraft, but is not a Federal traveler or dependents and other family members of Federal travelers who travel on Government aircraft.
  - (3) Senior Federal Traveler means an individual who is paid according to the Executive Schedule established by 5 U.S.C. 53, Subchapter II, including Presidential appointees who are confirmed by the Senate; employed in the U.S. Government's Senior Executive Service or an equivalent “senior” service; who is a civilian employee of the Executive Office of the President; who is appointed by the President to a position under section 105(a)(2)(A), (B), or (C) of title 3 U.S.C. or by the Vice President to a position under section 106(a)(1)(A), (B), or (C) of title 3 U.S.C; or who is a contractor working under a contract with an executive agency, is paid at a rate equal to or more than the minimum rate for the Senior Executive Service, and has senior executive responsibilities. The term senior Federal official or traveler, as used in the Federal Travel Regulation does not mean an active duty military officer.
  - (4) Commercial Aviation Services (CAS)--Commercial aviation services (CAS) include, for the exclusive use of an executive agency--(i) Leased

aircraft; (ii) Chartered or rented aircraft; (iii) Commercial contracts for full aviation services (i.e., aircraft plus related aviation services) or acquisition of full services through inter-service support agreements (ISSA) with other agencies; or (iv) Related services (i.e., services but not aircraft) obtained by commercial contract or ISSA, except those services acquired to support Federal aircraft.

- (5) Government Aircraft means an aircraft that is operated for the exclusive use of an executive agency and is a—
- (i) Federal aircraft, which an executive agency owns (i.e., holds title to) or borrows for any length of time under a bailment or equivalent loan agreement; or
  - (ii) Commercial aircraft hired as commercial aviation services.
  - (iii) A government aircraft does not include per seat purchases by travelers aboard scheduled domestic or foreign airlines (air carriers).

4. Internal Controls. [41 CFR parts 101-37, 300-3, 301-10, 301-70 and OMB Circular A-126]

- (a) Only authorized persons should travel onboard Government aircraft. For mission, required-use, other official and space available travel, all travelers need a determination by the travel approving official that such travel is necessary and that funds are available.
- (b) Senior Federal travelers located at DOE Headquarters planning on mission, other official travel or space available travel, the Headquarters (HQ) Office of Aviation Management (OAM) will provide assistance in conducting the analysis to provide the most cost-effective government aircraft option based on the traveler's travel requirements.
- (c) Senior Federal travelers located at the field elements planning on mission, other official travel or space available travel, the local Aviation Manager or Aviation Safety Officer will provide assistance in conducting the analysis to provide the most cost-effective government aircraft option based on the traveler's travel requirements.
- (d) Non-Federal travelers invited to travel with Federal travelers will coordinate and seek approval through the organization requesting the travel.
- (e) Required Use Travel will be approved by DOE's senior legal official or his/her principal deputy on a trip-by-trip basis, in advance, in writing, and in compliance with the DOE's written policies describing the special circumstances under which the agency will require a traveler to use Government aircraft, unless—

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- (i) The traveler is the Secretary (agency head) and the President has determined that the Secretary's travel (or in specified categories) qualifies as required-use travel; or
  - (ii) The traveler is not an agency head, and the Secretary has determined in writing that all of the traveler's travel, or travel in specified categories, qualifies as required-use travel.
  - (iii) Such written explanation must state the specific basis for the determination.
- (f) Senior Federal Traveler's using government aircraft for travel including mission, space available, required use travel, or other official travel must be approved by DOE's senior legal official or his/her principal deputy on a trip-by-trip basis, in advance, in writing, and in compliance with the DOE's written policies.
  - (g) All other travelers, except Senior Federal and Non-federal travelers, using government for travel is approved by the travel approving official, who must be one organizational level above the traveler.
  - (h) The use of government aircraft must be cost justified and approved, except for required use and mission travel, when it is shown through cost analysis to be more cost effective than other modes of travel or no regularly scheduled commercial airline service is reasonably available to fulfill the traveler's travel requirement (i.e., able to meet the traveler's departure and/or arrival requirements within a 24-hour period, unless you demonstrate that extraordinary circumstances require a shorter period).

## 5. Responsibilities

### (a) Single Traveler

- (1) Identify the need to travel and obtain approval from the travel approving official.
- (2) Contact the DOE travel agent for the costs of available commercial (airline, train, etc.) travel options.
- (3) Choose most cost-effective commercial travel option.
- (4) Receive concurrence from travel approving authority and travel.

### (b) Multiple Travelers

- (1) Identify the need to travel and obtain approval from the travel approving official(s).

- (2) Establish a point of contact and contact the DOE travel agent for the costs of available commercial (airline, train, etc.) travel options.
- (3) Contact HQ OAM or local Aviation Manager/Aviation Safety officer to provide trip details for Government aircraft option costs.
- (4) Conduct cost analysis to determine most cost-effective method of travel based on the available options to meet your travel requirements.
- (5) If commercial option is most cost-effective method of travel, provide travel approving authority with analysis and method of travel selected for approval. Receive approval and travel.
- (6) If government aircraft option is most cost-effective method of travel, contact HQ OAM or local Aviation Manager/Aviation Safety Officer to make tentative travel arrangements.
- (7) If you are Senior federal or Non-federal traveler create General Counsel (GC) memo to travel aboard a Government aircraft. According to OMB Circular A-126 and DOE O 440.2B, senior Federal travelers and non-Federal travelers aboard government aircraft need approval in writing from the Office of the General Counsel on a trip-by-trip basis. See Appendices C, D, and E for template GC and CC memos.
- (8) If you are Senior federal or Non-federal traveler send GC memo with cost justification (analysis) attached to travel approving authority and GC for review and signature, if applicable (based on which template memo was used). For all other travelers send cost justification (analysis) attached to travel approving authority for review and signature, if applicable
- (9) Receive final travel arrangements for HQ OAM or local Aviation Manager/Aviation Safety Officer after concurrence and approval by travel approving official and/or GC approval, if applicable.

**(b) Travel Approving Authority**

- (1) Review and approve traveler(s) travel request.
- (2) Concur with cost analysis and approved method of travel selected.
- (3) If commercial option was selected, send traveler approval to travel on selected method and archive all travel information for 2 years.
- (4) If Government aircraft option selected, receive GC memo from traveler for review and signature.

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- (5) Forward GC memo, if required, with cost justification (analysis) attached to HQ OAM or local Aviation Manager/Aviation Safety Officer for concurrence and signature.
  - (6) Notify traveler of GC decision.
- (c) HQ OAM or Local Aviation Manager/Aviation Safety Officer**
- (1) Receive details of trip and evaluate requirements.
  - (2) Obtain at least 3 quotes from CAS vendors or providers and fleet operators.
  - (3) Determine most cost-effective Government aircraft option.
  - (4) Send traveler(s) cost analysis with the most cost-effective option determined.
  - (5) If Government aircraft option method of travel selected, receive travelers request to reserve or schedule the flight.
  - (6) Upon traveler's approval make tentative flight arrangements.
  - (7) Receive GC memo to concur and forward to GC.
  - (8) Receive GC approved or disapproved memo.
  - (9) For Headquarters travel OAM notifies travel approving authority or for travel at a Field element the local Aviation Manager/Aviation Safety Officer notifies travel approving authority of GC decision.
  - (10) If travel is approved, implement final travel arrangements and archive memo and all travel information for 2 years.
  - (11) If travel disapproved, cancel flight arrangements and archive memo and all travel documentation for 2 years.
- (d) General Counsel**
- (1) Approves the travel by Senior Federal and non-Federal travelers using government aircraft.
  - (2) Reviews memo for compliance to OMB Circular A-126 and DOE O 440.2B, Section 4, paragraphs (o) – (r).
  - (3) Reviews the validity of the travel request:
    - (i) Is this trip reasonable?

- (ii) Is the persons and number of persons traveling reasonable?
- (iii) Is use of an aircraft even necessary for this trip?
- (iv) Have all aviation and transportation options been considered?
- (v) Reviews special requests, such as invitational travel, space available travel, use of private or corporate aircraft, etc.
- (vi) Approves or disapproves memo and returns memo to HQ OAM or local Aviation Manager/Aviation Safety Officer.
- (vii) Archives memo and all trip documentation for 2 years.

**6. Applicable Standards**

OMB Circular A-126

41 CFR parts 300-3, 301-10, 301-70 Federal Travel Regulations

DOE O 440.2B, Sections 4(o) - 4(r)

**7. Supplemental Guidance Documents**

Energy On-line Learning Center Aviation Training on OMB Circular A-126

General Counsel Memo Templates (Appendix A and B)

Travel on Government Aircraft Workflow Process (Appendix C)

DOE G 440.2B, Chapter 25





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## CHAPTER XVIII. USE OF MILITARY AIRCRAFT

1. **Purpose.** The purpose of this chapter is to ensure that an adequate framework exists for establishing processes for the acquisition or use of military aircraft. To ensure the DOE program needs are met with a cost effective, safe, secure and efficient fleet of aircraft.
2. **Applicability.** This chapter contains operational procedures and systems acceptable for Departmental aviation services when DOE elements plan to acquire surplus military aircraft or use military aircraft. The operation of other Government agency aircraft, including those of the Department of Defense (DoD) that are not under DOE operational control, is the responsibility of the respective agency.
3. **General**
  - (a) **Field Elements Planning to Acquire Military Surplus Manned Aircraft.** Responsible Departmental Field element managers should submit operating plans, maintenance plans, aviation safety documents, and other pertinent information with each request for approval to operate military surplus aircraft to the OAM Director not less than 180 days prior to an anticipated acquisition. Prior to entering service to DOE the aircraft must have:
    - (1) A FAA accepted maintenance program under 14 CFR Part 91.409(e) prior to operation.
    - (2) A FAA issued Certificate of Airworthiness in the appropriate category and limitations document.
    - (3) The aircraft must be registered in accordance with 14 CFR part 47.
    - (4) The aircraft must have the appropriate markings required by 14 CFR part 45.
  - (b) **Field Elements Planning to Acquire Military Surplus Unmanned Aircraft.** Responsible Departmental Field element managers should submit operating plans, maintenance plans, aviation safety documents, and other pertinent information with each request for approval to operate military surplus aircraft to the OAM Director not less than 180 days prior to an anticipated acquisition. Prior to entering service to DOE the aircraft must have:
    - (1) Tier I or II unmanned aircraft must have a FAA accepted maintenance program under 14 CFR Part 91.409(e) prior to operation or
    - (2) Tier III, IV or V unmanned aircraft must have a manufacturer's maintenance program that has been reviewed by the OAM or FAA to ensure the program is adequate to ensure its continued airworthiness prior to operation.

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- (3) Tier I and II unmanned aircraft must have a FAA issued Certificate of Airworthiness in the appropriate category and limitations document or
  - (4) Tier III, IV and V unmanned aircraft must have statement from the OAM, FAA designee, or the manufacturer the unmanned aircraft is airworthy and safe for its intended operation.
  - (3) The aircraft must be registered in accordance with 14 CFR part 47.
  - (4) The aircraft must have the appropriate markings required by 14 CFR part 45 for tier I and II unmanned aircraft and for tier III, IV or V unmanned aircraft an exemption from the Part 45 requirements.
  - (5) Cost and utilization data of UAS should be reported into the GSA Federal Aircraft Interactive Reporting System.
- (c) **Former Military Aircraft Operated by a State or other Federal Agency in use by the DOE.** The agency's aircraft program should be assessed by a DOE qualified aviation official to evaluate the airworthiness, training, and operation policies prior to use.
- (d) **Military Aviation Organizations Operating Under Military Operational Control**
- (1) Military aviation organizations operating on DOE property or with DOE personnel on board their aircraft should coordinate their activities with the DOE Field element's ASO.
  - (2) Responsibility for the safety of aviation missions under military operational control rests solely with the military organization conducting the aviation activity.

#### 4. **Applicable Standards**

DOE O 440.2B

#### 5. **Supplemental Guidance Documents**

FAA AC 00.1-1 Public Aircraft Operations

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## CHAPTER XIX. USE OF FOREIGN OPERATORS

1. **Purpose.** The purpose of this chapter is to ensure that an adequate framework exists for establishing processes for the use of foreign operated aircraft. To ensure the DOE program needs are met with a cost effective, safe, secure and efficient aircraft.
2. **Applicability.** This chapter contains operational procedures and systems acceptable for Departmental aviation services. The operation of other Government agency aircraft, including those of the Department of Defense (DoD) that are not under DOE operational control, is the responsibility of the respective agency.
3. **General.**
  - (a) The use of foreign air carriers; foreign manufactured, certified, maintained, or operated aircraft; or the use of foreign government or military aircraft may sometimes be necessary for accomplishment of the mission of the Department. Persons intending to use foreign aviation assets should use every reasonable effort to assure an equivalent level of safety with United States operations of similar nature.
  - (b) Officials should contact the Field elements Aviation Manager, Aviation Safety Officer or the Office of Aviation Management when acquiring foreign charter services to assess the safety program and standards of the foreign operator and assure that such services meet or exceed the International Standards for Airworthiness of Aircraft, Annex 8, and the International Standards and Recommended Practices for Operation of Aircraft, Annex 6, of The Convention on International Civil Aviation.
  - (c) The chartering of foreign air services should be coordinated with the Field element's AvM/APM and the OAM Director prior to operations. Officials planning the use of foreign air services should submit their request and appropriate supporting documents through the DOE Foreign Travel Management System, the local AvM/APM and the OAM Director not less than 30 days prior to the start of the services.

### 4. **Applicable Standards**

International Standards for Airworthiness of Aircraft, Annex 8, of The Convention on International Civil Aviation

International Standards and Recommended Practices for Operation of Aircraft, Annex 6, of The Convention on International Civil Aviation

DOE O 440.2B

DOE O 551.1C

DOE M 552.1-1A



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## CHAPTER XX. COMMERCIAL AVIATION SERVICES

1. **Purpose.** The purpose of this chapter is to ensure that an adequate framework exists for establishing processes for the use of Commercial Aviation Service providers. To ensure the DOE program needs are met with a cost effective, safe, secure and efficient aircraft.
2. **Applicability.** This chapter contains operational procedures and systems acceptable for Departmental aviation services. The operation of other Government agency aircraft, including those of the Department of Defense (DoD) that are not under DOE operational control, is the responsibility of the respective agency.
3. **General**
  - (a) Under current law, aircraft owned or hired by the DOE (public aircraft) are normally not subject to FAA oversight or required to comply with FAA regulations, except for certain FAA air space rules that apply to all aircraft within the United States. However, an aircraft that has been issued a Certificate of Airworthiness (C of A), regardless of the aircraft's operational status, public or civil, must comply with applicable FAA airworthiness rules. (The FAA retains oversight jurisdiction of the airworthiness of an aircraft, if the aircraft has been issued a FAA C of A and the operator, if issued an Air Carrier or Commercial Operator Certificates.) The FAA also has jurisdiction over "civil" aircraft operations. Civil aircraft operations are those flights that transport personnel to give speeches or attend meetings, conferences, political events, site visits, or training not associated with the operation or duties on-board a government aircraft. All other flight operations by definition are "public" flights.
  - (b) To ensure the safety of Departmental CAS aircraft activities, program managers should establish minimum requirements for CAS, state these requirements in written contracts, and perform oversight to ensure the safety of these operations.
  - (c) The Headquarters Program Office or Head of a Field element using CAS aircraft should appoint an individual, competent in site specific CAS operations, to be responsible for reporting (See Chapter XXV) and oversight (See Chapter XXII) of the CAS activities.
  - (d) At Headquarters, CAS operations are monitored and assessed by the Office of Aviation Management OAM that also can assist program and Field elements, coordinate the pre-award evaluation (for acceptance) of proposed CAS vendors or providers.
  - (e) CAS providers should hold an Air Carrier, Commercial Operator, or other appropriate certificates under 14 CFR Parts 121, 125, 127, 133, 135, 137, or 145, as applicable for the types of operations being conducted. In addition, the CAS provider is required to comply with all operating and maintenance requirements

of the CAS providers operation specifications or certificates while in service to the Department, in accordance with DOE O 440.2B.

- (f) Contracts for aircraft that carry DOE or contractor personnel should specify requirements for CAS vendors or providers. For example:
  - (1) Operating in accordance with the requirements of their certificate, even while operating as a public aircraft for the Department;
  - (2) Designating the specific aircraft and pilots that will be used for DOE missions;
  - (3) Specifying special equipment required for the particular operation, including shoulder harnesses for helicopter passengers or wire strike protection systems for helicopters; and
  - (4) Specifying operating procedures that are to be followed.
- (g) DOE and contractor CAS providers, except those involved in pipeline and power line patrols, that conduct operations less than 500 feet above ground level (AGL), should have hazard maps that depict current hazards to air navigation. The maps should indicate height AGL of all existing obstacles to flight on (1) the DOE site on which they operate; or (2) along commonly used flight paths, if the aircraft's enroute altitude is less than 500 feet AGL.
- (h) DOE and contractor organizations that acquire CAS aircraft to conduct pipeline and patrols operating at less than 500 feet AGL should use a system of warning signs and marker balls, supplemented with a current VFR sectional map, to alert pilots to hazards within power line or pipeline rights-of-way. Refer to Chapter XIII. In addition, the operator must have a waiver from 14 CFR §91.119 issued by the FAA for these airplane operations.
- (h) Multiengine turbine-engine-propeller or turbine-jet aircraft certified for instrument flight and operated by two qualified and current, instrument rated pilots under 14 CFR Part 135 should be used by DOE and contractor CAS providers during transportation flights. The aircraft should have dual flight controls, and instrumentation appropriate for a two-pilot crew. An IFR FAA flight plan should be filed.
- (i) Single engine aircraft may be used to support aerial photography, aerial survey, or research and development activities operated by a properly FAA licensed pilot. The aircraft should meet the recommendations in Chapter VIII and meet the field element's policies on the use of CAS aircraft.
- (j) CAS providers must comply with all applicable civil aircraft regulations and rules while in service to DOE as required by DOE O 440.2B.

**4. APPLICABLE STANDARDS**

14 CFR parts 119, 121, 125, 133, 137 and 135

41 CFR part 102-33

DOE O 440.2B

Federal Acquisition Regulations

DOE Acquisition Regulations

**5. Supplemental Guidance Documents**

FAA AC 00.1-1, Public Aircraft Operations





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## CHAPTER XXI. AVIATION SAFETY DOCUMENTATION

1. **Purpose.** The purpose of the Chapter is to state the basic recommendations for developing and standardizing Aviation Safety Documents (ASD) or Aviation Safety Reviews (ASR).
2. **Applicability.** This Chapter contains recommendations acceptable to DOE/NNSA elements that operate government aircraft that cannot comply with 14 CFR Chapter 1 and 49 CFR Subchapter C, Hazardous Material regulations, or Rotorcraft External Load operations, unmanned aircraft operations, or DOE O 440.2B requirements.
3. **General Information.**
  - (a) Aviation Safety Documentation (ASD) or Aviation Safety Reviews (ASR) shall be developed by each organization for missions that have risks not normally accepted by the public, and submitted to OAM for review. Missions not normally accepted by the public are any operation that cannot meet the operational, maintenance or certification rules of 14 CFR Chapter 1 or 49 CFR Subchapter C, Rotorcraft External Load operations, research and development activities, unmanned aircraft operations, or operations that cannot comply with DOE O 440.2B.
  - (b) The ASD or ASR shall contain:
    - (1) Description of the aviation mission.
    - (2) An analysis of the hazards.
    - (3) A description of deviations from the 14 CFR Chapter 1 or 49 CFR Subchapter C or DOE O 440.2B and the reasons for the deviations.
    - (4) Analysis of the risk and hazards.
    - (5) Identification of safety standards, administrative controls or physical barriers to mitigate the indentified hazards.
    - (6) Identification of the persons authorized to perform the work, including persons authorized to “stop work” if deviations from mission plan or standards is observed or noted.
    - (7) The Aviation Manager shall ensure the ASD or ASR is verified and the responsible government official of the operation is cognizant of the risks incurred and that those risks are accepted by the program official. If a generic ASD or ASR is developed for a continuing mission and other missions are identified with identical or similar characteristics, then supplements to the generic ASD or ASR may be added to address the specifics of the additional mission.

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- (8) All ASDs and ASRs should be reviewed by the Aviation Manager or Aviation Safety Officer, on a periodic basis, to determine their relevancy to current operational conditions and to revalidate the analysis that was originally conducted.
- 4. Identification.** Each ASD or ASR should have a unique identification number and date of initial or last review. Supplements to generic documentation should be acceptable, if they present only nuances to the generic documentation. The ASD or ASR should be signed by the individuals who prepared, reviewed, and approved the ASD or ASR. The introduction to the ASD or ASR should state the program's background, the type of review (initial, revision, or supplemental), and the expected time period to be covered by the operations. The aviation mission should be described in sufficient detail to establish the boundary of the significant parameters to be encountered during the accomplishment of the mission. The objective of the mission should be stated. The transportation of cargo, personnel, test equipment, or other items should be noted. The following discussion expands on these points.
- 5. Pre-flight.** The following items should be addressed:
- (a) Flight and qualified non-crewmembers qualifications.
  - (b) Base of operations for the project/mission.
  - (c) Flight following system, procedures, and communications.
  - (d) Day or Night operations.
  - (e) Operational restrictions, if any, consider Visual Metrological Conditions (VMC) or Instrument Meteorological Conditions (IMC).
  - (f) Flight altitude(s)--normal and restrictions.
  - (g) Departure points, destination and routing.
- 6. Takeoff and Landing.** The ASD or ASR should include an evaluation of the aircraft takeoff and landing capability, area of operation (runway length(s), takeoff and landing zone(s), elevation), flight endurance, cruise speed, and for multi-engine aircraft--include analysis of single engine performance and limitations,. Conditions that require changes from a normal flight envelope should be noted, and the consequences of the changes identified.
- 7. Certification Authority.** The ASD or ASR should include and state the certification authority (FAA, Civil Aircraft Authority, Manufacturer, DOE) and the category and class of the aircraft, specific operating limitations and restrictions should include:
- (a) Altitude and service ceiling limitations (if altitude is a function of type of fuel, the relationships must be included).

- (b) Airspeed limitations.
- (c) Takeoff, landing, and enroute temperatures used for performance planning.
- (d) Weight and balance limitations and methods of calculating weight and balance.
- (e) If Certificate of Airworthiness (Standard, Restricted, Experimental, etc.) is required.
- (f) Category of aircraft (Normal, Transport, Utility, Experimental, etc.).
- (g) Takeoff and landing weather minimums.
- (h) Cross-wind and wind-gust limitations.
- (h) Emergency procedures for systems and degraded modes of operation.
- (i) Instructions of continued airworthiness.
- (j) Ground station communication limitations.
- (k) Other information necessary for the safe operation and maintenance of the aircraft, based on the aircraft's intended use.

**8. Other Items to Consider.** The following items should be considered

- (a) Mission geographic location.
- (b) Terrain (elevation, vegetation, man-made structures).
- (c) Weather (temperatures, moisture, cloud cover, wind, thunderstorms, other adverse conditions).
- (d) Air traffic and type of airspace to be used.
- (e) Flight and duty time limitations for pilots, crewmembers, observers, and mission scientist (fatigue management system).

**9. Mission Hazards**

- (a) Mission hazards (include the type, severity, and probability of the risk based on each hazard and the controls or method(s) to reduce the risk) such as:
  - (1) Flight path obstacle hazards;
  - (2) Mid-air collision hazards;
  - (3) Terrain collision hazards;
  - (4) Radiation, Biological, or Chemical contamination hazards;

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- (5) Effects of installations of special equipment in or on the aircraft (e.g., in the slipstream of the aircraft, electrical system loads);
  - (6) Electrical fire caused by equipment;
  - (7) Inclement weather;
  - (8) Degraded modes of operation based on mission equipment or aircraft systems and components; and
  - (9) Crew fatigue due to high cycle (take off and landing workload) operations, hours of operation, etc.
- (b) Operational hazards should be evaluated (include general risks, probability and severity associated with the aircraft operation and unique risks because of the type of mission). The worst case scenario and the highest potential for loss of life, injury, or property damage cost in dollar terms should be included. Hazards include:
- (1) Single/multi-engine failure.
  - (2) Damage to ground facilities or personnel injury caused by an aircraft accident or mishap.
  - (3) Survival in remote areas.
  - (4) Operations over water.
  - (5) Aircraft communication lost link or lost communications.
  - (6) Cold weather operations, including icing, crew survival, and other potential hazards.
- (c) The location, position and composition of the pilot(s), crew and other essential mission personnel, as appropriate, should be stated. Emergency exits and drills shall be conducted in order to evaluate their effectiveness.
- (d) The special equipment configurations and weights required to conduct the mission should be identified.
- (e) The need for survival equipment should be evaluated.

**10. FAA Certificates, Waivers, and Certificates of Authorization (Unmanned aircraft only).**

- (a) The certification of installations using approved data acceptable to the Administrator or a FAA report from a Designated Airworthiness or Engineer Representative shall be included.

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- (b) For unmanned aircraft operations, once the FAA Certificate of Authorization (COA) has been obtained, the COA shall be included in the documentation.
  - (c) If deviations from Federal, State, FAA regulations, or regulations of other governments have been taken, the specifics of the deviations, the reasons there for, and the consequence should be stated.
  - (d) Consistent with Objective statement in DOE O 440.2B, DOE has elected to apply the operation, pilot qualification and maintenance standards contained in the applicable sections of 14 CFR Chapter 1, Parts 21, 43, 61, and 91 as the minimum safety standards for Departmental aircraft operations. This is the Department's choice since by definition DOE-Federal aircraft operations are considered public aircraft and not subject to FAA oversight or enforcement, except for certain rules governing the operation of aircraft within the National Airspace System. However, Field elements may, and should, adopt more stringent safety standards as warranted through a safety and risk management review process (ISM).
- 11. Technical Assistance.** A Field or program element should contact the Office of Aviation Management for technical assistance or request examples of ASDs or ASRs for the development of an aviation safety review.
- 12. Approval Processes for an ASD and Operations Authorization.**
- (a) An ASD should be approved using the Field elements processes or procedures for approval of operations that have risk, but must include notification and coordination with the Federal AvM/APM and/or Federal ASO.
  - (b) The approval authority should be placed at the lowest level within an organization when the risk analysis code indicates "low risk."
  - (c) The approval authority should be placed at the management level above the operational organization conducting the activity when the risk analysis code indicates "medium risk."
  - (d) The approval authority should be placed at the Field element's manager with program manger and OAM concurrence when the risk analysis code indicates "high risk."
- 13. Applicable Standards.**
- Title 14 CFR Chapter 1
- Title 41 CFR part 102-33
- DOE O 440.2B



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## CHAPTER XXII. AVIATION SAFETY

1. **Purpose.** The purpose of this chapter is to ensure that an adequate safety program exists for an effective, efficient, secure and safe aviation operation.
2. **Applicability.** This chapter contains operational procedures and systems acceptable for Departmental aviation services. The operation of other Government agency aircraft, including those of the Department of Defense (DoD) that are not under DOE operational control, is the responsibility of the respective agency.
3. **General.** The DOE aviation safety program is focused on ensuring a safety management system is implemented as required by DOE regulations and policies and the management of risks associated with the use of DOE-Federal aircraft, CAS. Managers, supervisors, employees and contractors involved in the aviation program should share in the establishment of an aviation safety culture and successful implementation of the aviation safety management program. Aviation safety management procedures issued by DOE/NNSA elements should be consistent with this Guide and with the provisions of DOE O 440.2B and DOE policies on Integrated Safety Management, DOE P 450.4.
4. **Management Responsibility.** DOE's goal is to provide the safest possible aviation services by (1) employing sound management and operational procedures; (2) having a safe and healthful workplace and mitigating all recognized hazards for its employees and the employees of Departmental contractors; (3) protecting Government property against accidental loss and damage, and; (4) protecting the environment and the health and safety of the public. In pursuing this goal, the Department maintains an active aviation safety management program based on the philosophy that proper risk management of unnecessary risks for identified hazards is the responsibility of all the management and employees involved. Accident, incident, and mishap prevention are inherent functions of management, which promotes a safety culture within their organizations. All Departmental and contractor personnel involved in aviation activities should participate in the aviation safety management program and should take an active role in the identification, reduction, and mitigation of hazards based on risk management methodology.
5. **Program Management.** The OAM Director is responsible for establishing policies and guidance for the DOE aviation safety management program, aviation risk management methodology, promoting an aviation safety culture, and revising programs as necessary. At DOE senior management levels, appropriate heads of DOE Headquarters and its Field elements, and PMAs are responsible for aircraft accident, incident and mishap prevention and promoting an aviation safety culture. Managers and supervisors at other administrative levels share in the responsibility for implementation of their respective aviation safety management program.
6. **Program Elements.** The following six categories are essential to aviation safety management programs at all administrative levels within DOE. Some programs may

include other subjects, depending on the aviation activities implemented to help accomplish specific DOE missions.

- (a) Aviation Safety Program Responsibilities
- (b) Integrated Safety Management Program and Risk Management
- (c) Aviation Appraisal Program (internal and external)
- (d) Aviation Safety Awards Program
- (e) Aircraft Accident Investigation
- (f) Aviation Safety Education and Training

## **7. Staffing.**

- (a) Headquarters and Field elements that operate DOE-Federal or CAS aircraft must designate individuals as Aviation Managers and/or Aviation Safety Officers, in accordance with DOE O 440.2B, Section 5, paragraph f. (5). DOE/NNSA elements should provide Aviation Managers and/or Aviation Safety Officers with aviation safety training to ensure an effective aviation safety management program is overseen and implemented.
- (b) The DOE Headquarters' ASO position(s) should be located within the Office of Aviation Management. The individual(s) should be responsible for developing, coordinating, and implementing the DOE aviation safety management program, along with the administration of the Department's safety awards program, reporting, analysis, and implementing an Aircraft Accident Incident Reporting System (AAIRS) or process.
- (c) An Aviation Manager (AM), if assigned, to a DOE Field element where DOE-Federal or CAS aircraft activities occur, should be responsible for the management and safety of the local aviation safety management program with full authority to carry out and act upon the assigned responsibilities. This position may be full-time equivalent or collateral duty based on the assessment of needs by management. The incumbent should be competent in all parts of the DOE aviation program, applicable regulations and policies, and arrange for organizational self-assessments.
- (d) An Aviation Safety Officer (ASO) should be assigned to a DOE Field element where DOE-Federal and/or CAS aircraft activities occur. The ASO should be responsible for the management and safety of the local aviation safety management program with full authority to carry out and act upon the assigned responsibilities for the local aviation safety management program, including elements such as self-assessment, risk management, reporting, education and training, safety awards, and providing AAIRS reports when necessary. This



position may be full-time equivalent or collateral duty based on the assessment of needs by management.

- (e) An individual appointed by the Headquarters program or Field element manager or by an Aviation Manager having responsibility for aviation safety management at a DOE Field element, other than those noted in (c) and (d) above, should have full authority to carry out and act upon the assigned responsibilities for the local aviation safety management program, including elements such as self-assessment, risk management, reporting, education and training, safety awards, and providing AAIRS reports when necessary. The Headquarters program or Field element manager or Aviation Manager should notify the OAM of the individual's name and contact information.

**8. Qualifications and Training Aviation Safety Personnel.** The personnel identified in (b) thru (e) above should have the knowledge and training commensurate with their assigned responsibilities and if required by DOE policy meet the recommendations of Chapter V; and complete the training recommended in Chapter VI of this document.

**9. Roles and Responsibilities.**

- (a) General. Primary leadership and management of the aviation safety management program rests with the OAM Director (Senior Aviation Management Official (SAMO)) and the designated Headquarters' and Field element's AMs and ASOs.
- (b) OAM Director (SAMO). The OAM Director should:
  - (1) Establish, promote, and maintain the Department's aviation safety management program;
  - (2) Designate the ASO(s) within the Office of Aviation Management;
  - (3) Perform aviation independent safety and management oversight and conduct and participate in functional aviation safety investigations, appraisals, and reviews through agreements with Headquarters and field elements;
  - (4) Monitor and/or participate in DOE Type A and B aviation accident investigations; and
  - (5) Concur with respect to aviation safety matters in the purchase and lease of DOE aircraft in accordance with DOE and Federal regulation and policy.
- (c) OAM's ASO(s). The OAM's ASO(s) should:
  - (1) Develop Departmental aviation safety management policy statements for inclusion in appropriate DOE documents, which include:

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- (i) Aviation safety publications;
  - (ii) Integrated Safety Management (Safety Management System) methodology;
  - (iii) Identification of operational considerations for accident prevention efforts;
  - (iv) Review and publish of aircraft and equipment manufacturers, vendors, and airport and heliport owners and operators safety issues; and
  - (v) Liaison activities with government and non-government organizations for purposes of promoting aviation safety and DOE safety culture.
- (2) Identify, develop, and coordinate aviation safety and aircraft accident prevention education and training activities;
  - (3) Administer the DOE Aviation Management and Safety Awards Programs;
  - (4) Provide technical assistance and advice to DOE Headquarters and Field elements in developing and implementing their aviation safety management program and accident prevention efforts;
  - (5) Review DOE aviation safety publications and initiate appropriate recommendations;
  - (6) Include appropriate “lessons learned” information in aviation safety documents disseminated to the DOE aviation community;
  - (7) Represent DOE regarding aviation safety matters with other Government agencies and non-government organizations;
  - (8) Develop and administer the Department’s aviation accident and incident reporting system or process; and
  - (9) Develop and maintain an aviation safety training program to indoctrinate all new DOE and contractor management and safety officer personnel into the DOE aviation safety management program. This training may be incorporated into existing indoctrination programs or be given separately by the Headquarters ASO or a field aviation safety individual. The program should cover DOE aviation missions and activities; Federal regulations; DOE policies; individuals responsible for aviation safety; and other appropriate guidance.

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- (d) Headquarters' program and Field element managers and Administrators of PMAs. Each head of a Field element or administrator of a PMA whose organization utilizes aviation operations should:
- (1) Know and understand their roles and responsibilities found in the DOE Functions, Authorities, and Responsibilities Manual (DOE M 411.1C FRAM).
  - (2) Publish an aviation safety management policy to implement the policies and procedures contained in DOE O 440.2B, DOE M 450.4-1, and in other Departmental documents.
  - (3) Designate a full-time or collateral duty individual to be responsible for overseeing and implementing the aviation safety management program. (This individual is often located in the organization's Environment, Safety and Health office.)
- (e) DOE Field element ASOs. Each DOE Field element ASO should:
- (1) Arrange for Aviation Safety Notices and Aviation Safety Alerts to be:
    - (i) presented and discussed in preflight briefings and flight safety meetings; and
    - (ii) posted on aviation safety bulletin boards and in flight activity areas where aviation personnel can readily see them for a minimum of fourteen (14) days.
  - (2) Establish and maintain a functional aviation safety file, which should include:
    - (i) Aviation Safety Notices;
    - (ii) Aviation Safety Alerts;
    - (iii) Preliminary and final reports of aircraft accidents;
    - (iv) Aviation safety program appraisal reports; and
    - (v) Minutes of aviation safety meetings.
  - (3) Establish Flight Readiness Review Boards as necessary to meet program needs.
  - (4) Oversee and conduct self-assessments, reviews, or audits of aviation program to ensure the Integrated Safety Management is implemented.

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- 10. Aviation Safety Appraisal Program.** Appraisal programs are an integral part of ISM by providing feedback and information to improve the safety program. The goal of all DOE personnel conducting aviation safety appraisals should be the same - to determine and document the adherence to safety requirements and policies, safety performance, and the effectiveness of an activity according to predetermined requirements and industry recommended practices. In addition, appraisals should identify alternate methods of conducting activities that enhance the safety of the program and the effectiveness of administrative controls or engineering controls to mitigate risk.
- (a) Office of Aviation Management (OAM). The Director, OAM has the responsibility for conducting independent audits, reviews, and evaluations of the safety and management of the aviation programs of the Department. The Oversight Protocols developed for the conduct of the aviation safety and management audits, reviews, and appraisals accomplished by OAM are reviewed and accepted by the Office of Health, Safety and Security's Office of Independent Oversight. The OAM independent audits, reviews, and evaluations of the safety and management are conducted on all DOE/NNSA elements engaged in aviation activities. The reports generated by the OAM are issued to DOE/NNSA senior management and the field element managers and tracked by the OAM in accordance with DOE O 414.1C.
  - (b) Heads of Field elements and Administrators of PMAs. Heads of Field elements and Administrators of PMAs should ensure internal aviation safety management and functional appraisals, assessments or audits are conducted. Because of the proximity to their respective operations, field ASOs are responsible for conducting the appraisals, assessments, or audits on a more frequent basis than the annual or biennial audits conducted by the OAM. The internal appraisals, assessments and oversight audits should be of sufficient scope and frequency to ensure the safety, efficiency and effectiveness of their aviation safety program. The assistance of a Headquarters' ASO(s) may be requested.
- 11. Program Promotion.** Headquarters' Program Offices and Field elements should ensure resources are available for safety education and training. Attendance should be encouraged at aviation safety management training sessions and aviation safety seminars sponsored by government, commercial, or military organizations, and academic institutions.
- 12. Reporting of Accidents, Incidents and Hazards.** The Department is subject to many different reporting requirements. Regardless of the reporting requirement, no Field element or contractor accident, incident or hazard report should go to an agency outside the DOE without also being reported to the OAM. This section will address aviation safety reporting specific to the DOE aviation programs. For guidance on the DOE Occurrence Reporting and Processing System (ORPS) refer to DOE-STD-1045-93; Guide to Good Practices for Notifications and Investigation of Abnormal Events and DOE O 232.1A, Occurrence Reporting and Processing Information. ASOs should refer to Title 49 CFR Part 830, National Transportation Safety Board (NTSB) Reporting of

Aircraft Accidents and Incidents for those requirements. The following paragraphs will address reporting of aircraft damage, injury to personnel, damage to DOE aviation property resulting from Government operations and missions, safety concerns, and aviation hazards by DOE/NNSA elements or contractors according to DOE policies and NTSB regulations. A key element of an Integrated Safety Management program is feedback and improvement processes.

(a) Aviation Mishap and Hazard Notification. These procedures are applicable to all DOE and DOE contractor personnel involved with DOE-Federal aircraft and CAS aircraft operations or procurement. Responsibilities:

(1) Field ASOs. Field ASOs should report any mishaps, incidents, accidents, safety hazards, or concerns to the DOE OAM as soon as possible. In addition, Field ASOs should participate in the DOE's Aircraft Accident and Incident Reporting System and process for notification of aviation mishaps. Subsequently, additional information on an aviation mishap should be obtained by a Field element or Headquarters ASO for inclusion in the DOE's AAIRS and process from the DOE Occurrence Reporting and Processing System (ORPS).

(2) DOE and Contractor Employees. It should be the responsibility of all DOE and contractor employees to report all aircraft accidents, incidents, safety concerns, aviation hazards, and maintenance deficiencies known to them to the Field elements ASO. In addition, the Field elements and contractors should develop internal processes that allow for anonymity from the reporter to promote the reporting of safety information.

(b) DOE's AAIRS and Process for Mishap and Hazard Reporting. A person directly associated with DOE aviation activities may submit an AAIRS Report to the OAM Headquarters or Field ASO, including contractors and government personnel in support of DOE aviation program activities. The identification of the originator is desirable, but not mandatory. However, the Field ASO or OAM Headquarters ASO will need to take the report in the format provided by the OAM to be tracked by AAIRS. Accidents, incidents, hazardous conditions, etc., that do not pertain to aviation safety and aircraft accident prevention are not to be reported to the OAM using an AAIRS Report, those types of reports should be filed using the organization's established safety and health reporting systems or processes. In addition to aircraft accidents and incidents defined by Title 49 CFR Part 830, report the following to the OAM using the AAIRS format:

(1) Breaking, bending, or denting any part of the aircraft while on the ground (being taxied, pushed, or mechanically maneuvered with a tug, tow bar, etc.) while handling, taking off, or in the air;

(2) Blowout of any tire during landing;

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- (3) Bird strike;
  - (4) Failure of any gyro-driven instrument;
  - (5) Alternator or generator failure;
  - (6) Fuel exhaustion;
  - (7) Engine failure;
  - (8) Hot starts requiring inspection per operating or engine maintenance manual;
  - (9) Compressor stalls resulting in damage;
  - (10) Failure of landing gear to extend;
  - (11) Smoke in the cockpit;
  - (12) Inadvertent flight into IMC;
  - (13) Overtorque (as defined by the aircraft manufacturer) requiring inspection;
  - (14) Engine fire; and
  - (15) Exercising emergency authority to deviate from a Federal Aviation Regulation, established DOE policy or administrative control established to mitigate risk.
- (c) Processing the AAIRS Reports. AAIRS Reports should be processed by the originator within the following time limits:
- (1) aircraft accidents, incidents, and mishaps [1 working day];
  - (2) aviation hazards [5 working days]; or
  - (3) maintenance deficiencies [5 working days].
- (d) “IMMINENT DANGER” Reporting. Conditions of “IMMINENT DANGER” should be reported immediately to appropriate supervisory personnel in any form or manner necessary, but should be followed up within 24 hours with an AAIRS Report to OAM and the local ASO.

NOTE: IMMINENT DANGER as defined in the Basic Program elements for Federal Employee Occupational Safety and Health Programs and Related Matters (29 CFR 1960.2), means “any condition or practice in any work place which is such that a danger exists which could reasonably be expected to cause death or serious physical harm immediately or before the imminence of such danger can

be eliminated through normal procedures.” Whenever an individual concludes that such unsafe acts, conditions or practices exist in aviation activities, they should immediately inform the individual in charge. This person should undertake immediate action to remove all personnel from the hazard. Such acts, conditions or practices should immediately be reported to the designated ASO or individual responsible for the aviation safety program.

- (e) Internal Feedback and Reporting Processes. Headquarters and each Field element should establish a reporting process for safety issues. The process or system should be used to improve processes, ensure the safety of activities, and used to conduct analysis and measure safety effectiveness. Any system or process may be established, as long as, it promotes the reporting of aviation safety information.
  - (1) The process or system should include sources and methods of collecting information, information review and processing and information dissemination. The Headquarters ASO should disseminate aircraft mishap and hazard information to Headquarters offices and to Field element ASOs and other personnel responsible for the aviation safety program within their DOE/NNSA element.
  - (2) Each respective ASO should disseminate information to appropriate personnel in their organization who are involved in aviation activities. Disseminated publications should include the following:
    - (i) Aviation Safety Notices;
    - (ii) Aviation Safety Alerts;
    - (iii) Aviation Safety Lessons Learned Publications; and
    - (iv) Aircraft Accident, Incident, Hazard, Deficiency Synopsis or Videos (of previous years’ circumstances).
- (f) Definitions of Aviation Mishap. An aviation mishap is a deviation from normal operations and includes the following:
  - (1) Aircraft Accident. An occurrence associated with the operation of an aircraft, which takes place between the time any individual boards the aircraft with the intention of flight and any such individuals have disembarked, and in which any individual suffers death or serious injury or the aircraft receives substantial damage, as described in Title 49 CFR Part 830. When two or more aircraft are involved in an accident, the aircraft with the most substantial damage should be used to determine the accident classification.
  - (2) Aircraft Incident. An occurrence other than an accident that could affect the safety of operations. Examples of incidents are:

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- (i) Personnel - An injury reportable under OSHA regulations requiring first aid or medical attention.
  - (ii) Damage to Aircraft - Any damage less than substantial with engines/rotors turning and there is an intent to fly.
  - (iii) Forced Landing - A landing necessitated by failure of engines, systems or components which makes continued flight impossible; and which may or may not result in damage.
  - (iv) Precautionary Landing - A landing necessitated by apparent impending failure of engines, systems, or components which makes continued flight inadvisable.
- (3) Aircraft Ground Event - A mishap in which there is no intent to fly; however, damage incurred requiring replacement or repair of rotors, propellers, wheels, tires, wing tips, flaps, etc.; or an injury reportable under OSHA regulations is incurred requiring first aid or medical attention.
- (4) Near Mid-Air Collision - An unplanned incident associated with the operation of an aircraft in which a possibility of collision occurs as a result of proximity of less than 500 feet to another aircraft or a report is received from a pilot or flight crew member stating that a collision hazard existed between two or more aircraft.
- (5) Aviation Hazard. An aviation hazard is any condition, act, or set of circumstances, including maintenance conditions or circumstances, that compromises the safety of personnel or resources engaged in aviation activities. These hazards may include inadequacies, deficiencies, or unsafe practices pertaining to all aspects of aviation operations activities.
- (6) Maintenance Deficiency. A serious defect or failure causing mechanical difficulties encountered in aircraft operations, not specifically identified as an incident, or aviation hazard. DOE O 440.2B also requires maintenance deficiencies to be reported to the FAA Service Difficulty Reporting system.
- (g) NTSB Reporting
- (1) Initial Notification of Aircraft Accidents, Incidents, and Overdue Aircraft. The ASO at a DOE site that manages or oversees DOE Federal aircraft, including operation of Federal aircraft by DOE contractors, an aircraft accident, incident or overdue aircraft should immediately, and by the most expeditious means available, notify, or ensure that, the nearest NTSB field office is notified when an aircraft accident or any of the following incidents occur:



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- (i) Flight control system malfunction or failure;
  - (ii) Inability of any required flight crew member to perform normal flight duties as a result of injury or illness;
  - (iii) Failure of structural components of a turbine engine excluding compressor and turbine blades and vanes;
  - (iv) In-flight fire; Aircraft collide in flight;
  - (v) Damage to property, other than the aircraft, estimated to exceed \$25,000 for repair (including materials and labor) or fair market value in the event of total loss, whichever is less;
  - (vi) For large multiengine aircraft (more than 12,500 pounds maximum certificated takeoff weight):
    - 1 In-flight failure of electrical systems which requires the sustained use of an emergency bus powered by a back-up source such as a battery, auxiliary power unit, or air-driven generator to retain flight control or essential instruments;
    - 2 In-flight failure of hydraulic systems that results in sustained reliance on the sole remaining hydraulic or mechanical system for movement of flight control surfaces;
    - 3 Sustained loss of the power or thrust produced by two or more engines;
    - 4 An evacuation of an aircraft in which an emergency egress system is utilized; or
    - 5 An aircraft is overdue and believed to have been involved in an accident.
- (2) Initial Notification of Aircraft Accidents, Incidents, and Overdue Aircraft. The ASO at a DOE site that manages or oversees a CAS operation. The Aviation Manager or Aviation Safety Officer is responsible for ensuring the CAS operator report an aircraft accident, incident or overdue aircraft immediately, and by the most expeditious means available, notify, or ensure that, the nearest NTSB field office is notified when an aircraft accident or any of the following incidents listed in (g) (1) occur.
- (h) Reporting of Public Aircraft Accidents and Incidents. The ASO at a DOE site operating a DOE owned (public) aircraft other than an aircraft of the Armed Forces or Intelligence Agencies should ensure that a report is filed to the NTSB on NTSB Form 6120.1 (OMB No. 3147-001) within 10 days after an accident or

incident listed above. The Form is obtainable from the Board field offices noted below, the NTSB, Washington, D.C. 20594, and the FAA, Flight Standards District Office. The report should be filed with the field office of the Board nearest the accident or incident. NTSB field offices are listed under U.S. Government in the telephone directories in the following cities: Anchorage, Alaska; Atlanta, Georgia; Chicago, Illinois; Denver, Colorado; Fort Worth, Texas; Miami, Florida; New York, New York; Seattle, Washington; and Washington, DC. In addition, the Field ASO or Headquarters ASO may be required to submit information to the DOE ORPS.

### **13. Aircraft Accident Prevention Program**

- (a) Purpose. The purpose of the Aircraft Accident Prevention Program is to minimize the occurrence of aircraft accidents and incidents and eliminate unnecessary risks in DOE aviation operations.
- (b) Aircraft Accident Prevention Plan. Each DOE/NNSA element that uses government aircraft should have a formal written safety management system that includes aircraft accident prevention consistent with Departmental policy. The safety management system should include goals, personnel responsibilities, implementation guidelines, and methods utilized to monitor the success of the program. Heads of DOE/NNSA elements should ensure that their safety management system includes the critical elements presented below at appropriate levels of their aviation activity.
  - (1) Risk Assessment. Risk assessment is the subjective analysis of physical hazards and operational procedures to arrive at a GO/NO-GO decision. The pilot-in-command retains final authority for a GO/NO-GO decision. (See the Aviation Safety Documentation Chapter of this Guide.)
  - (2) Education and Training. Heads of DOE/NNSA elements should assure that employees involved in the use or control of aviation resources receive appropriate aviation safety training. The guidance provided in this section should be considered the minimum necessary for developing operational and management skills. Additional needs unique to specific DOE missions should be included when appropriate.
  - (3) Mission Planning. Aviation operations should be planned with adequate consideration given to accident prevention. Flights should be conducted as planned and in accordance with Departmental policy and procedures. Deviations from an approved mission profile should not be permitted except for deviations normally accepted by the public and for safety of flight considerations. The following items should be included in mission planning:
    - (i) Define the work, task, mission, and flight profile.

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- (ii) Flight routes and altitudes (domestic, international). A thorough map reconnaissance of the route to be flown should be accomplished for preplanned low-level flights.
  - (iii) Hazard identification (e.g.; takeoff or landing weight, landing areas, hazards to aerial navigation, weather conditions, time of year, Wire Strike Prevention.)
  - (iv) Risk analysis and assessment of the mission and of a project.
  - (v) Controls established (e.g. weather minimums, only standard category aircraft, only pilots with ATP, etc.)
  - (vi) Management approval of other than routine use activities.
  - (vii) When a DOE mission dictates that flights are to be conducted in proximity to ground wires, special consideration should be given to the flight environment. All helicopters should conform to the wire strike protection equipment requirements in the “DOE-Federal Helicopters – Minimum Equipment” section of this Guide. Risk assessments to reduce wire strike potential should be conducted prior to flight. Low-level flight hazard maps should be developed for the local operational areas, and assessed frequently to ensure the accuracy of the information.
- (4) Operational Environment Considerations. Pilots should be cognizant of environmental conditions. A GO/NO-GO decision should be made with regard to operating safely in environmental conditions. For example, flying into forecasted severe turbulence is a potential mishap contributing factor; the decision to do so is a mishap causal factor.
- (5) Aviation Life Support Equipment. The ASO should coordinate during the planning and actual operations with the pilot-in-command to ensure that appropriate aviation life support equipment is on board the aircraft or being worn by appropriate individuals based on DOE requirements, guidelines, project needs, seasonal variations, the requirements of other countries, and other requirements.
- (6) Flight Following. Each DOE/NNSA element should include a flight-following requirement in its aircraft accident prevention plan. As a minimum, the flight-following requirements should meet the requirements of the “Aviation Operations” section of this Guide. The safety management system should specify the method or procedure to be utilized which will accommodate

communications from mission personnel or the pilot to the flight-following facility at predetermined intervals.

- (7) **Load Calculations.** Proper consideration and planning should be given to the aircraft weight and balance computation and subsequent loading for each takeoff and landing for all aircraft. The weight of personnel and/or cargo should be considered relative to environmental and aircraft performance capabilities. Adequate documentation of load calculations should be determined by the DOE/NNSA element conducting the aviation operation.
- (8) **Maintenance and Inspection Program.** Proper consideration and planning should be given to the aircraft and mission equipment maintenance and inspection programs to ensure operational environment does not require additional maintenance or inspection of airframe, engine, rotors, appliances and components.
- (9) **Post Mission Analysis.** At the completion of each day's mission conduct post mission and debriefing. Determine if original hazard analysis was correct, identify any additional controls that are necessary, and report changes as required to Aviation Management.

**14. Aviation Safety Analysis.** The Headquarters OAM ASO(s) should maintain an aviation safety analysis process or system using data from DOE and other accident and incident reports, hazard reports. The process or system should include the organization of numerical data for the purposes of measuring performance trends, solving problems, and for determining cause resolution (REFER TO DOE G 440.2B-1, AVIATION PERFORMANCE INDICATORS). The analytical efforts should be conducted frequently to ensure that the results are relevant to current DOE aviation operations. The results should be disseminated as a part of the aviation safety information program.

- (a) **Aviation Safety Trend Analysis.** Each field ASO should maintain an aviation safety trend analysis process or system which covers the type of aircraft used in the aviation operations of his/her DOE site. The process or system should include sources of data on the site aircraft such as NTSB accident reports, FAA mechanical interruption summaries, service difficulty reports, AAIRS data and other government and commercial organization reports pertinent to the type of aircraft used and the type of aviation operations conducted at his/her site. This data should be used to monitor potential airworthiness and operational concerns for the aircraft type of mission and enhance the safety of DOE operations.
- (b) **Organization of Numerical Data.** Numerical data descriptive of DOE aviation activities should be processed and portrayed in terms of rates, e.g., the number of incidents per departure, to account for differences in exposure. In addition, such data should be presented in absolute terms, e.g., the number of mechanical

failures of a particular part. Presentation in both formats is desirable because of the widely varying types of aviation missions of DOE. Careful consideration should be given to the type of DOE mission when comparative data (among aircraft type, use, government versus commercial sector) is used in an analysis.

- (c) Portrayal of Numerical Data. Numerical data should be portrayed as annual rates, cumulative rates, moving average rates, or other rates appropriate to the type of data used in an analysis. Each type of rate has advantages and disadvantages depending on the perspective of the user. The analyst should use those rates which accurately and relevantly depict Government aircraft use. Processed data should be displayed as tables, figures, pie charts, bar charts, and trend charts, or in other ways which clearly and concisely show the results and trends.
- (d) Specific Purpose Analysis Techniques. Analyses focused on specific questions should be conducted when the outcome is seen as beneficial to DOE aviation activities. For example, a risk analysis, hazard analysis, cost-benefit analysis, opinion survey, or accident causation model should be completed when the results are deemed necessary to DOE aviation safety. DOE procedures and guidelines should be used in conducting such efforts (REFER TO DOE O 210.2, DOE Corporate Operating Experience Program).

## **15. Distribution of Aviation Safety Information.**

- (a) DOE-Wide Distribution. The Headquarters OAM ASO(s) shall be responsible for obtaining and distributing pertinent DOE-wide aviation safety information to the field. The Headquarters OAM ASO(s) shall publish "Aviation Safety Alerts" and "Aviation Safety Notices" when appropriate. When items of DOE-wide significance are paramount, special meetings should be called by the Headquarters OAM ASO(s). These meetings should have a formal agenda and schedule. If appropriate, a draft publication should be prepared and distributed prior to a meeting.
- (b) Field-Level Distribution. At the field level, the individual responsible for aviation safety should obtain and distribute pertinent aviation safety information within his/her respective organization in addition to that distributed by the Headquarters ASO(s). For those elements that have DOE-Federal aircraft, mechanisms such as briefings and flight crew reading files should be used for the distribution of safety information. At both Headquarters and field levels, memoranda, video, and audio tapes should be used.

## **16. Aviation Safety Committees or Councils**

- (a) Purpose. The purpose of an aviation safety committee/council is to provide a forum for identifying and solving aviation safety problems or issues. Participation in an aviation safety committee/council gives personnel other than

the ASO a personal interest in the aviation safety program and enhances the effectiveness of the program.

- (b) **Committee Level and Structure.** There should be a joint aviation safety committee at the Headquarters level sponsored and chaired by the OAM ASO consisting of Headquarters and Field element aviation safety or management personnel. In addition, a field aviation safety committee/council comprised of respective personnel at each DOE/NNSA field element that manages or oversees DOE-Federal aircraft or conduct CAS operations. The Headquarters aviation safety committee should be chaired by a Headquarters OAM ASO(s). Committee/council members should be representatives of the Office of Aviation Management, the Headquarters program officials, and other field elements selected by the Headquarters ASO(s). Each DOE/NNSA element aviation safety committee/council should be chaired by that organization's ASO(s). Committee/council members should be representatives of DOE and contractor aviation operations, maintenance, and ground support units. The committee/council the size should be dependent on the extent of the aviation activities. Headquarters and DOE Field element committees/councils should meet at least annually and at the call of the chairperson.
- (c) **Responsibilities.** In general, committees/councils should concentrate on issues where information is needed from several different sources and the support and concurrence of several different managers is needed for resolution. Issues of a very routine or trivial nature that are the responsibility of a single manager should not be reviewed. The responsibilities of a committee/council should include:
- (1) Reviewing selected incident and hazard reports and recommending corrective actions;
  - (2) Reviewing selected aviation safety problems and recommending solutions; and
  - (3) Reviewing the effectiveness of aviation safety program elements and recommending improvements.
- (d) **Committee Management.** Management of each aviation safety committee/council should be the responsibility of the chairperson. The following guidelines on committee management should be considered:
- (1) **Schedule.** Meetings should be scheduled as regular events, not as unscheduled happenings.
  - (2) **Agenda.** The agenda should be based on solicitations from committee members and others. The agenda should be published early and the meeting should be cancelled if there are no agenda items. The agenda and related materials should be distributed prior to a meeting. At the meeting the agenda should be revised if necessary.

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- (3) Draft Minutes. Draft minutes of a meeting should be distributed for factual accuracy comments within two weeks of the meeting.
  - (4) Final Minutes. Final minutes of a meeting should contain the signature of the chairperson, serve as an action document, and be distributed two weeks after the due date for comments on the draft minutes.
  - (5) Follow Up. Members should be informed at the next meeting on the status of action items.
  - (e) Chairing a Meeting. The chairperson should keep the group moving steadily toward the objective; obtain the best possible contributions from the group; and assure that the minutes accurately reflect the group's opinions and conclusions.
  - (f) Aviation Management and Safety Awards. The Aviation Management Safety Awards Program may be found in Chapter XXVIII.

**17. Applicable Standards**

Title 14 CFR Parts 119, 121, 125, 133, and 135

Title 49 CFR Parts 172, 175, and 830

DOE O 440.2B

DOE O 210.2

DOE P 411.1

DOE M 411.1-1C

DOE O 414.1C

**18. Supplemental Guidance Documents**

HAI Safety Manual

FAA AC 120-92 Introduction to Safety Management Systems for Air Operators Safety Management System

FAA AC 150/5200-37 Introduction to Safety Management Systems (SMS) for Airport Operators

International Helicopter Safety Team, Safety Management System Tool Kit





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## CHAPTER XXIII. FLIGHT READINESS REVIEW BOARDS

1. **Purpose.** The purpose of this chapter is to ensure that adequate guidance exists for the formation and administration of the Flight Readiness Review Board (FRRB).
2. **Applicability.** This chapter contains operational procedures, processes or systems acceptable for Departmental aviation services. The operation of other Government agency aircraft, including those of the Department of Defense (DoD) that are not under DOE operational control, is the responsibility of the respective agency.
3. **General.** A Flight Readiness Review Board (FRRB) is a body of experts that advises Departmental managers on the hazards of a proposed aviation operation. The FRRB assists in the evaluation of the Aviation Safety Documentation or Safety reviews for operations that cannot comply with DOE or Federal regulations, unmanned aircraft operations or Rotorcraft External Load operations. An FRRB should be established for research and development projects involving aviation, but may be established to assist managers in determining the hazards associated with other proposed aviation operations. The objective of the Board is to provide technical and operational expertise in identifying, evaluating, and quantifying the level of risk for a proposed aviation operation such that managers can decide on the net value of the operation. The cognizant line manager should not approve an aviation operation if an FRRB determines that the risk level of the operation is high. FRRB recommendations that a mission or operation is considered “high risk” should be approved at the Headquarters program management level.
4. **Discussion.** The OAM or a Headquarters’ Program manager, Field element’s aviation manager or aviation safety officer can establish a FRRB if there is a research and development program or other type of operation that has a known or possible risk level that is greater than that normally incurred in commercial aviation operations. (Such as an aircraft operation that requires waivers or deviations from FAA regulations, DOE aviation policy, or a Field element’s established policy or procedure, unmanned aircraft operations, etc.) If the aviation manager has been delegated authority from the DOE Field element manager, he/she may approve an aviation operation that the FRRB has determined to have a low or medium level of risk. The Field element’s aviation manager or aviation safety officer should be qualified and have aviation experience to chair a FRRB.
  - (a) The DOE site ASO should identify the need for establishing a FRRB. The ASO should act as the chairperson or assign a chairperson, select the membership, and publish the documentation of the Board, including the risk level determination. The chairperson should ensure that deficiencies identified by the Board are satisfactorily resolved and that corrective actions are incorporated into the Aviation Safety Documentation for the aviation operation being reviewed.
  - (b) The DOE contract project managers have responsibility for providing technical assistance and information required by a FRRB and for correcting the Aviation Safety Documentation for deficiencies found by the Board.

- (c) The responsibilities of the Flight Readiness Review Board include reviewing all technical information and the Aviation Safety Documentation or Safety Review documentation for the aviation operation. The Board should determine the level of risk associated with the aviation operation and provide recommendations for mitigating identified aviation hazards.
- (d) The responsibilities of the chairperson include assigning areas of responsibility to Board members, acting as liaison between the Board and external entities, voting on issues presented to the Board, providing written dissenting opinions, and preparing the final report of the Board.

## **5. Procedures**

- (a) Flight Readiness Review Board members should be individuals with experience as flight or test pilots, aviation operations managers, ASOs, aviation maintenance personnel, aviation accident investigators, or in an engineering discipline of value to the Board. They should be individuals who do not have programmatic responsibility for the aviation operation being evaluated.
- (b) The Flight Readiness Review Board should operate on a consensus basis. If a dissenting opinion exists that cannot be resolved, the chairperson should be given a written dissenting opinion to include in the final report.
- (c) Observers to a Flight Readiness Review Board may include DOE programmatic personnel, program sponsor representatives, and representatives of M&O or support service contractors and subcontractors. Information from observers to the Board should be taken into consideration; however, to maintain the independence of the Board, observer opinions need not be included in the report.
- (d) The chairperson should begin the process by calling the Board to order. A briefing on the type of mission and aircraft involved should be provided by the project manager. The chairperson assigns tasks and schedules meetings as necessary. The Board should review all documentation and interview personnel involved with the program. Upon completion of the reviews and interviews, the Board should have thorough discussions and assign a risk level through a vote of the members. All information should be documented and a report provided to the project ASO. This information should be used for final disposition by management at the DOE Field element responsible for the project.

## **6. Applicable Standards**

Title 14 CFR Chapter 1

Title 49 CFR Subchapter C

## **7. Supplemental Guidance Documents**

Defense Logistic Agency (DLAM 8210.1) Contractor's Flight and Ground Operations  
Volume I

HAI Safety Manual

FAA AC 120-92 Introduction to Safety Management Systems for Air Operators Safety  
Management System

FAA AC 150/5200-37 Introduction to Safety Management Systems (SMS) for Airport  
Operators

International Helicopter Safety Team, Safety Management System Tool Kit



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## CHAPTER XXIV. AVIATION ACCIDENT INVESTIGATION

1. **Purpose.** The purpose of this chapter is to ensure that an adequate framework exists for establishing processes during an aircraft accident or incident investigation. Nothing in this chapter should be construed or change any requirements contained in any Department of Energy (DOE) directive or Federal regulation.
2. **Applicability.** This chapter contains accident investigation procedures and processes acceptable for Departmental aviation services. The accident investigation of other Government agency aircraft, including those of the Department of Defense (DoD) that are not under DOE operational control, is the responsibility of the respective agency.
3. **General.** Accidents involving Departmental aircraft should be investigated according to the instructions given in DOE O 225.1A, Accident Investigation, the associated implementation guidance, DOE O440.2B, 49 CFR Part 830, and Federal Management Regulation Subpart 102-33.445, Aircraft Accident and Incident Reporting and Investigation and successor regulations.
4. **Notification.** DOE/NNSA elements should immediately notify the NTSB, FAA, DOE and the OAM of any aircraft accidents or incidents that are required to be reported by 49 CFR Part 830. In accordance with the passage of Public Law 103-411 (April 23, 1995), the NTSB is charged with investigating all public aircraft accidents which include DOE aviation accidents. See Chapter XXII for other guidance on accident and incident reporting.
5. **Requirements.** Federal Management Regulation Subpart 102-33.445, Aircraft Accident and Incident Reporting and Investigation states that Federal agencies should:
  - (a) Develop an agency or Field element specific aircraft accident and incident response plan;
  - (b) Request designation as party to the NTSB investigation in accordance with (NTSB) 49 CFR 831.11 and assist the NTSB to the maximum extent possible;
  - (c) Be prepared to participate in NTSB investigations of agency owned aircraft;
  - (d) Conduct a parallel investigation of an aviation accident/incident;
  - (e) Report any condition which has potential to cause an aviation related mishap;
  - (f) Provide training to your agency personnel who may be asked to participate in an NTSB investigation;
  - (g) Assure the agency reporting requirements are in compliance with the NTSB definitions contained in 49 CFR 830.2; and

- (h) Refer to 49 CFR Part 830 and Chapter XXII of this guide for further details when required to report an aircraft accident, incident, or overdue aircraft to the NTSB.

Note: The NTSB will determine and publish the probable cause of the aircraft accident.

## 6. DOE Guidance

- (a) Refer to DOE G 225.1A-1, Accident Investigations for specific requirements.
- (b) DOE Accident Investigation Boards (AIBs) should coordinate their investigations with the NTSB and incorporate the final NTSB report into the final DOE AIB report. You may or may not be able to participate in the NTSB's determination of the probable cause of the accident.
- (c) Request designation as party to the NTSB investigation in accordance with (NTSB) 49 CFR 831.11 and assist the NTSB to the maximum extent possible.
- (d) The DOE and NTSB investigations should be done in parallel on a non-interference basis.
- (e) Effective communication between the DOE AIB and the NTSB investigator are essential and should be made a priority.

## 7. DOE Aviation Procedures

- (a) An ASO from the OAM should monitor the accident investigation.
- (b) An OAM ASO should be present at the geographic location of the accident and assist in the early stages of the investigation.
- (c) An OAM ASO should function as a resource for the AIB Chairman and provide advice and assistance as requested by the AIB Chairman.
- (d) Every effort should be made to ensure that AIB members have some basic knowledge of aviation operations prior to their assignment to the AIB. A basic knowledge of aviation is particularly important in the selection of an AIB chairperson.
- (e) AIBs are encouraged to seek advice from aviation technical experts. Technical experts that may be able to contribute to the investigation include DOE aviation experts, manufacturer's technical representatives, the FAA, the military, and private consultants which are subject matter experts.

- (f) Investigations of unmanned aircraft systems will be treated and reported the same as manned aircraft accidents or incidents.

## **8. DOE Aviation Accident Investigator Qualifications and Experience**

- (a) The Accident Investigator should have completed at a minimum of one or more of the following:
  - (1) NTSB Accident Investigation Training; or
  - (2) Technical Safety Institute Accident Investigation Training; or
  - (3) University Southern California Safety Institute Accident Investigation Course; or
  - (4) DoD Services (U.S. Army, Air Force, Navy or Marine Aircraft Accident Investigation).
- (b) The Accident Investigator should
  - (1) Be certified as an ICAP Safety Officer,
  - (2) Have completed the Aviation Manager or Aviation Safety Officer Functional Qualification Program; and/or
  - (3) Completed the DOE Accident Investigator Course.
- (c) The assigned Aviation Accident Investigator should:
  - (1) Be knowledgeable in the type of aircraft involved in the accident;
  - (2) Have participated on a Type-A or -B accident investigation; and
  - (3) Have five (5) years experience in civil or Federal government aviation operations.

## **9. Applicable Standards**

DOE O 225.1A Accident Investigation

DOE O 440.2B

Public Law 103-411 (The Independent Safety Board Act of 1994)

Title 49 Part 830 Notification and Reporting of Aircraft Accidents or Incidents and Overdue Aircraft, and Preservation of Aircraft Wreckage, Mail, Cargo, and Records

**10. Supplemental Guidance Documents**

DOE G 225.1A-1 Accident Investigation

HAI Safety Manual

NTSB Accident Investigation Handbook



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## CHAPTER XXV. AVIATION REPORTING REQUIREMENTS

- 1. Purpose.** The purpose of this chapter is to provide guidance on the requirements to ensure that Field elements file all required reports in a timely manner.
- 2. Applicability.** This chapter contains reporting procedures, processes and systems acceptable for Departmental aviation services. The reporting procedures of other Government agency aircraft, including those of the Department of Defense (DoD) that are not under DOE operational control, is the responsibility of the respective agency.
- 3. General.** Aviation organizations should comply with the reporting requirements listed in DOE O 440.2B section 4 Requirements, paragraph n. Reporting, OMB Circular A-11, Section 7 Exhibit 300, and 41 CFR 102-33 or successor regulations promulgated by DOE, OMB or GSA. Department Field element managers may establish additional reporting criteria as required. The OAM Director is the DOE Senior Aviation Management Official (SAMO) and shall receive and distribute reports external to the Department. The reporting schedules in 41 CFR 102-33 are based on the due dates to the General Services Administration (GSA), Federal Aviation Administration (FAA), and the National Transportation Safety Board (NTSB). In addition, OMB Circular A-11 impose certain initial and recurrent reporting requirements and the OAM may provide earlier reporting schedules if applicable. The purpose is to allow time for the OAM Director to verify, review, and consolidate reports from the Department Field elements before transmitting the final report(s) to the appropriate external organization.
- 4. Senior Federal Traveler Reporting.** Field elements shall submit semi-annual reports for the periods October 1 through March 31, and April 1 through September 30 to the OAM for all travel by Senior Federal Travelers (Officials), members of their families, and non-Federal travelers and all travel by Senior Executive Branch Officials onboard Government aircraft acquired by the Department in accordance with 41 CFR 102-33 and OMB Circular A-126 or successor regulations promulgated by GSA or OMB. The terms “Senior Federal Official” and Senior Executive Branch Official are defined in 41 CFR 102-33 and parts 300-3, 301-10, 301-70 and in this guide, Attachment 3.
- 5. Aircraft Accident and Incident Reporting.** See Chapter XXII of this guide.
- 6. Service Difficulty and Malfunction Defect Reporting.** DOE elements that own aircraft conducting aviation operations certified by the FAA under 14 CFR parts 119 and 121, 135, or 125 are required by the regulations to report service difficulties, defects and unairworthy conditions to the FAA. In addition, DOE O 440.2B requires reporting service difficulties, defects and unairworthy conditions to the FAA for all operations within DOE. The field element should report significant maintenance defaults or difficulty reports to the OAM Director for accident prevention purposes when similar aircraft are in service at other DOE locations. The report made to the OAM Director should be in the format and in the time frame deemed appropriate by the Departmental element owning, leasing, chartering, and operating the aircraft.

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7. **OMB Circular A-76 studies.** The application of the requirements of OMB Circular A-76 to DOE elements is found in the DOE Competitive Sourcing--Human Resources Guidebook, published on December 15, 2005. Refer to the guide or contact the Office of Management for details involving OMB A-76 studies.
8. **Accepted Operator (CAS vendor) Reporting.** Each field office that acquires CAS services must conduct an initial safety assessment of each CAS vendor it hires and if a continuing need exists, thereafter every two years, as required by DOE O 440.2B. In order to facilitate the distribution of accepted CAS vendors to the DOE, the OAM maintains a list of these accepted CAS vendors on its web site at <http://management.energy.gov/aviation.htm>. It is essential that field elements report these vendors to the OAM as soon as possible to ensure current information is available.
- (a) The following information should be submitted:
- (1) The business name of the vendor;
  - (2) Location including City name, State, or Province and Country;
  - (3) Primary Business Phone number;
  - (4) The FAA or Civil Aviation Authority Air Carrier or Operating Certificate number, if applicable;
  - (5) Type or types of flight operations conducted such as Aerial Applications, Aerial Patrol, Aerial Photography, Aerial Survey, Air Transportation Personnel and/or Cargo, Rotorcraft External Load operations or Research and Development;
  - (6) Types of aircraft operated such as small, medium, or large; airplanes or helicopter; single engine multi-engine; or turbine, piston, jet;
  - (7) Operation limitations such as Day or Night, VFR or IFR, or no limitations such as Day/Night VFR/IFR;
  - (8) Date of initial or last assessment;
  - (9) Date of next assessment due (2 years after the initial by the end of the last day in the month the vendor was assessed.); and
  - (10) Identification of the assessing organization such as OAM, CH (Chicago), LSO (Livermore Site Office), Wyvern, ARG/US (Aviation Resource Group/United States), or DoD (Department of Defense), etc.
- (b) It is the policy of the DOE to accept CAS vendor assessments conducted by Wyvern, LLC, Aviation Resource Group/United States (ARG/US), or Department of Defense (DoD) in lieu of an assessment by DOE officials, because these

organizations have rigorous processes to ensure the operators comply with the highest standards of safety and effectiveness.

9. **Cost and Utilization Data Reports required by 41 CFR part 102-33 and DOE O 440.2B.** DOE/NNSA elements must report costs and flight hours for Federal and CAS aircraft (manned and unmanned) on a quarterly basis and changes in your Federal aircraft inventory within 14 calendar days to the Federal Aviation Interactive Reporting System (FAIRS). FAIRS is a management information system operated by GSA to collect, maintain, analyze, and report information on Federal aircraft inventories and cost and usage of Federal and CAS aircraft. Users access FAIRS through a highly-secure Web site. The FAIRS User's Manual contains the business rules for using the system and is available from OAM or GSA. Field elements must assign a person responsible for submitting these reports and notify the OAM of their name and contact information. The OAM will arrange for the individual to gain access to FAIRS and receive training on the use of the FAIRS.
10. **OMB Circular A-11, Exhibit 300, Life-cycle Analysis, and Business Case Studies.**
  - (a) Field elements that are responsible for overseeing and managing DOE-owned aircraft must prepare an initial Exhibit 300, if one has not been submitted, and provide updates as required by the Circular every year thereafter. The following paragraphs provide guidance on the preparation, submission and review of these studies.
  - (b) As of 2007, DOE aviation programs have never submitted an Exhibit 300, Life-cycle Analysis, or Business Case studies for the aircraft programs. The exception to the previous statement was in 1999 and 2002, the OAM conducted Comprehensive Aviation Program studies, Phase I and II. These were the first studies ever conducted by an agency to baseline its aviation program, customer/program requirements for aircraft and provide life-cycle analysis for fleet modernization efforts. In 2006 the GSA and OMB clarified that OMB Circular A-11 Section 7 Exhibit 300 applied to aviation programs. The DOE enacted this requirement with the change 1 revision to DOE O 440.2B in 2006. The OAM will use these studies to maintain a Phase III Comprehensive Study that will be used to provide business cases studies for its on-going aviation programs and to provide a path forward for fleet modernization for the next 20 years.
  - (c) Format of the Exhibit 300, Business Case Study and Life-cycle Analysis. The OMA is responsible for reviewing, concurring, and making recommendations to DOE and NNSA senior managers on the Exhibit 300 reports. Therefore, the OMA recommends the following format for Field elements to submit their Exhibit 300, Business Case and Life-cycle studies:
    - (1) Each report should have an executive memorandum signed by the senior official responsible for the program funding or management or their

designee transmitting the Exhibit 300 to the OAM. The memorandum will include the tabs as specified below with the Exhibit 300 and supporting the data. The transmittal memorandum should provide a short summary of the recommendations, if any, from the Exhibit 300 and business case study.

- (2) Tab A—Is the completed OMB Exhibit 300 form indicating in question 6 whether the aviation program is:
  - (i) Planning (new aviation program)
  - (ii) Full Acquisition (submitted solely to document a single or multiple aircraft acquisition)
  - (iii) Operations and Maintenance (on-going, no planned acquisitions)
  - (iv) Mixed Life Cycle (on-going program report with planned acquisitions)
  - (v) Multi-Agency Collaboration (only for submitted for interagency support service agreements to conduct DOE aviation operations)
  
- (3) Tab B—Is the Aviation Program History, Description, and Strategic Goals section. This tab should contain as complete of history of the aviation program including customers, program goals, types of operations conducted, and how the program supports the DOE's Strategic Goals and the President's Management Agenda. The aviation program needs to show how it supports the DOE's strategic goals and the President's Management Agenda, in order to pass a review by OMB or DOE financial auditors. As an example:
  - (i) Background, Customers, and Aircraft Missions;
  - (ii) Strategic Alignment with the Department of Energy Goals and the President's Management Agenda;
  - (iii) Organizations' Performance Plan;
  - (iv) Aviation Performance Goals and Measurement;
  - (v) Existing Fleet Age and Airframe Hours;
  - (vi) Aviation Program Management and Administration;
  - (vii) Historic and Forecast Aviation Program Budget and Use Rate;
  - (viii) FTE Personnel and Projected FTE costs;

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- (ix) Definitions, if required;
  - (x) Justification for Acquisition of Products by Brand Name, if required; and
  - (xi) Market Research (Commercial Aviation Service Vendors) and Other Agencies Capabilities.
- (4) Tab C-- Aviation Program Aircraft Requirements. This Tab should include program requirements, business rational or other analysis to justify the entire fleet of aircraft within the program, if submitting an initial Exhibit 300. If the Exhibit 300 is submitted to report a single aircraft acquisition, then justification for the single aircraft is all that is required. The Tab C should include:
- (i) Fleet Size Analysis, including:
    - 1 Historic Flying Hours (previous 5 years);
    - 2 Minimum Flight Hours to meet Program Requirements;
    - 3 Desired Flight Hours to meet future Program Requirements;
    - 4 Aircraft Availability, Mission Capability Rates, Departure Reliability Rates, or program measures;
    - 5 Criteria Used in Developing Aircraft Requirements including safety margins, fuel requirements, etc.;
    - 6 Current Aircraft Capability;
    - 7 Replacement Aircraft Capability;
    - 8 Required Equipment;
    - 9 Mission Capabilities versus Mission Requirements Ranking; and
    - 10 Aircraft Requirements Summary.
- (5) Tab D--Cost Benefit, Life Cycle Cost, Net Present Value and Return On Investment Analyses. This Tab should include:
- (i) Cost Benefits of the Aviation Program, including Return on Investment analysis;
  - (ii) Alternatives Analysis;

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- (iii) Financial Analysis;
  - (iv) Acquisition cost and funding profile analysis;
  - (v) Life Cycle Cost analysis including summary of the on-going program + acquisition cost and operations funding profile (No FTE Included) (Inflated Dollars); acquisition cost 20-Year Life Cycle cost; program Life Cycle Cost ranking with FTE; and Net Present Value analysis; and
  - (vi) Advantages and Disadvantages of the alternatives.
  - (vii) Conclusions and Recommendations.
- (6) Tab E--Risk Management Plan Aviation Program. This Tab should address the aspects of reducing risk through the acquisition process. The Tab should include:
- (i) Introduction;
  - (ii) Previous Performance;
  - (ii) Managing Financial Risk; and
  - (iii) Risk Assessment Plan.
- (7) Tab F-- Cost Analysis Tables. This Tab will contain the Life-Cycle Analysis (LCA) comparison tables and/or data to support the recommendations within the Exhibit 300 and Tabs B thru D. Field elements should contact the OAM for examples of Microsoft Excel Spreadsheets that can be used for computations. The Tab should include the following tables or analysis:
- (i) Cost Analysis 20-YR LCA, On-Going Program with No Purchase (Status Quo);
  - (ii) Cost Analysis 20-YR LCA, On-Going Program with Purchase Versus Status Quo;
  - (iii) Cost Analysis 20-YR LCA, On-Going Program + Purchase Versus Full Service Alternative;
  - (iv) Cost Analysis 20-YR LCA, On-Going Program + Purchase Versus Lease/Purchase Alternative;
  - (v) Cost Analysis 20-YR LCA, On-Going Program + Purchase Versus Full Lease Alternative;

- (vi) Direct Operating Cost (DOC) Comparison Existing Aircraft Versus Replacement Aircraft;
- (vii) Cost Benefit Analysis Aircraft Versus Ground or Other Alternative; and
- (viii) Return on Investment Analysis.

**11. Aviation Performance Indicators.** Refer to DOE G 440.2B-1 for complete guidance for implementing these measures. Aviation performance indicator data should be maintained and reported in accordance with field elements policies.

**12. Applicable Standards.**

Federal Management Regulations, 41 CFR part 102-33

Department of Energy Property Management Regulations, 41 CFR 109-37

14 CFR parts 121, 125, and 135

OMB Circular A-76

OMB Circular A-11

OMB Circular A-126

DOE O 440.2B

DOE O 225.1

DOE O 232.1A

**13. Supplemental Guidance Documents**

FAIRS User Manual

DOE Competitive Sourcing--Human Resources Guidebook, published on December 15, 2005





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## CHAPTER XXVI. AVIATION SECURITY PROGRAMS

1. **Purpose.** The purpose of this chapter is to ensure that an adequate framework exists for establishing an aviation security program and to prevent the loss, damage, destruction, hijacking, acts of terrorism, or theft of DOE-Federal aircraft.
2. **Applicability.** The recommendations in this Chapter can be applied to all Federal aircraft operations and sets forth the recommendations for a basic aviation security program.
3. **General.** DOE-Federal aircraft operations are diverse in their operations and working environments, therefore, no single program can address all of the circumstances faced by the Aviation Managers and Aviation Safety Officers in the field. At the current time DOE-Federal aircraft are subject to Transportation Security Administration (TSA) security rules [49 CFR part 1550]. DOE organizations that have been issued FAA air carrier certificates for Part 121 operations must comply with §121.538, unless issued an exemption by the TSA. However, certain guidance and elements of an aviation security program can be implemented based on the following rules governing aircraft and airport security the Transportation Security Administration – Title 49 CFR part 1544.
4. **Responsibilities.**
  - (a) Field element's Aviation Manager (AvM).
    - (1) The Aviation Manager is responsible for ensuring an effective aviation security program is implemented for aircraft operations under his/her oversight or control.
    - (2) The Aviation Manager should assume the responsibilities of Aviation Security Coordinator or assign the duties to someone within the Field element's organization as appropriate.
  - (b) Aviation Security Coordinators (ASC). The ASC and any alternates should be appointed by the AvM and should serve as the Field element's primary contact for aviation security related activities and communications. Either the ASC, or an alternate ASC, must be readily available 24 hours a day or as applicable to the Field element's operation.
    - (1) Is responsible for coordinating with the Field element's Security and Safeguards program official, if applicable or other appropriate security personnel to ensure:
      - (i) An aviation security plan is integrated with any site security program, if applicable;

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- (ii) Applicable processes are implemented to ensure the protection of Federal aircraft from sabotage, destruction, theft, acts of terrorism or hijacking;
  - (iii) The aviation security program addresses Federal aircraft away from the base station or parked in remote sites; and
  - (iv) The security program addresses procedures during normal and heightened alert status.
- (2) Reports to the Aviation Manager and/or Aviation Safety Officer and the Field element's Site Security official any breach of aviation security processes.
  - (3) Keeps current on relevant TSA and DOE issued security directives and regulations.
  - (4) Reviews all security-related functions for which the Federal operator is responsible, for effectiveness and compliance with their procedures and program or the Field element's Site Safeguards and Security plan, and applicable Security Directives issued by the TSA.
  - (5) Provides immediate initiation of corrective action for each instance of noncompliance, with the procedures and security plan or the Field element's Site Safeguards and Security plan and applicable TSA Security Directives. At foreign airports where such security measures are provided by an agency or contractor of a host government, the DOE-Federal aircraft operator must notify TSA for assistance in resolving noncompliance issues.
- (c) In-flight Security Coordinator. DOE-Federal aircraft operators should designate or use the pilot-in-command as the In-flight Security Coordinator for each domestic and international flight to perform duties specified in the Field element's security plan or the Field elements Site Safeguards and Security plan.

## **5. Recommended Program Elements.**

- (a) Personnel with Direct Access to DOE-Federal Aircraft should have:
  - (1) Criminal background checks accomplished on all personnel assigned to DOE facilities that have direct access to DOE-Federal aircraft; or
  - (2) Hold appropriate security clearances issued by the DOE.
- (b) Personnel with Direct Access to DOE Federal Aircraft employed by Contract Maintenance Facilities.

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- (1) DOE/NNSA elements that hire domestic contract maintenance facilities to perform maintenance on the Federal aircraft should:
    - (i) Use only reputable and licensed repair stations;
    - (ii) Ensure employees are United States citizens; and
    - (iii) Ensure adequate quality control processes are implemented to detect tampering or intentional sabotage of government property.
  - (2) DOE/NNSA elements that hire foreign contract maintenance facilities to perform maintenance on the Federal aircraft should:
    - (i) Use only reputable and licensed repair stations; and
    - (ii) Ensure adequate quality control processes are implemented to detect tampering or intentional sabotage of government property.
  - (c) Acceptance and Screening of Individuals and Accessible Property.
    - (1) Preventing or deterring the carriage of any unauthorized explosive, incendiary, or deadly or dangerous weapon is the primary reason for screening personnel and accessible property. DOE-Federal aircraft operators should use measures to prevent or deter the carriage of any unauthorized weapon, explosive, or incendiary on or about each individual's person or accessible property before boarding an aircraft or entering an aircraft boarding area or any TSA sterile area.
    - (2) Operators of DOE-Federal aircraft should ensure that each individual, other than Federal agents or couriers, entering an aircraft boarding arm or TSA sterile area at each pre-board screening checkpoint for which DOE is responsible, and all accessible property under that individual's control, are inspected for unauthorized weapons, explosives, and incendiaries.
    - (3) Operators of DOE-Federal aircraft should ensure that at locations other than an aircraft boarding arm or TSA sterile area, will ensure prudent measures are enacted at each pre-board screening checkpoint. These would include 100% identification checks of DOE and Contractor personnel to positively identify the individual has a need to be aboard the aircraft and informed that their accessible property under that individual's control, may be inspected for unauthorized weapons, explosives, and incendiaries.
  - (d) Refusal to transport. Operators of DOE-Federal aircraft must deny entry into an aircraft boarding area or any TSA sterile area and must refuse to transport:

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- (1) Any individual who does not consent to search or inspection of his or her person; and
  - (2) Any property of any individual or other person who does not consent to a search or inspection of that property.
  - (3) Operators of DOE-Federal aircraft may deny entry into an aircraft at locations other than a boarding area or any TSA sterile area and may refuse to transport any individual who does not consent to search or inspection of his or her person.
- (e) Prohibitions on carrying a weapon, explosive, or incendiary.
- (1) Except as provided in the following paragraph, the DOE-Federal aircraft operator may not permit any individual to have a weapon, explosive, or incendiary, on or about the individual's person or accessible properly when on board an aircraft.
  - (2) The provisions in the above paragraph with respect to accessible weapons, do not apply to Federal Agents, DOE Federal Agents, DOE Special Agents, DOE Federal Officers, couriers, on duty DOE Security Police Officers, or law enforcement officers (LEO) aboard a flight for which screening is required if the requirements of this paragraph are met. (This paragraph does not apply to a Federal Air Marshal in duty status, DOE Federal Agents on duty, or when State law requires the carriage of weapon on board the aircraft for survival purposes). When State law requires the carriage of a weapon for survival purposes, then the Field element must establish a process or procedure to ensure the weapon is secure and cannot be readily used by an unauthorized person.
  - (3) Unless otherwise authorized by Field element's Aviation Manager or Aviation Security Coordinator, the armed official must meet the following requirements:
    - (i) Be a Federal law enforcement officer or a full-time municipal, county, or state law enforcement officer who is a direct employee of a government agency.
    - (ii) Be sworn and commissioned to enforce criminal statutes or immigration statutes.
    - (iii) Be authorized by the DOE or employing agency to have the weapon in connection with assigned duties; and/or
    - (iv) Completed the training program "Law Enforcement Officers Flying Armed."

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- (4) In addition to the requirements of paragraph (3), i- iii, the armed official must have a need to have the weapon accessible from the time he or she would otherwise check the weapon until the time it would be claimed after deplaning. The need to have the weapon accessible must be determined by the DOE Aviation Manager or Aviation Security Coordinator and be based on one of the following:
- (i) The provision of protective duty, for instance, assigned to a principal or advance team, or on travel required to be prepared to engage in a protective function;
  - (ii) The conduct of a hazardous surveillance operation;
  - (iii) On official travel required to report to another location, armed and prepared for duty; or
  - (iv) Employed as a DOE Federal agent or LEO, whether or not on official travel, and armed in accordance with DOE policies governing travel established by the DOE by directive or policy statement.
- (f) Staffing. The operator of a DOE-Federal aircraft must staff its aircraft boarding areas or security screening checkpoints with supervisory and non-supervisory personnel in accordance with the standards specified in the Field element's Site Safeguards and Security plan or establish procedures for flight crewmembers to check personnel.
- (g) Acceptance and screening of stowed (checked) baggage.
- (1) The operator of a DOE-Federal aircraft must establish and use the procedures, facilities, and equipment described in the Field element's Site Safeguards and Security plan to prevent or deter the carriage of any unauthorized explosive or incendiary onboard aircraft in stowed (checked) baggage.
  - (2) Acceptance. Operators of DOE-Federal aircraft must ensure that stowed (checked) baggage carried in the aircraft is received by its authorized aircraft operator representative.
  - (3) Screening of stowed (checked) baggage. Except as provided in a Field elements Site Safeguards and Security plan, operators of DOE-Federal aircraft must ensure that all stowed baggage is inspected for explosives and incendiaries before loading it on DOE-Federal aircraft.
  - (4) Firearms, explosives or incendiary devices in stowed (checked) baggage. Operators of DOE-Federal aircraft may not knowingly permit any person, other than an LEO, to transport in checked baggage:

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- (i) Any loaded firearm(s); or
  - (ii) Any unloaded firearm(s) unless:
    - 1 The person declares to the aircraft operator, either orally or in writing before checking the baggage that any firearm carried in the baggage is unloaded;
    - 2 The firearm is carried in a hard-sided or other accepted container;
    - 3 The container in which it is carried is locked, secured or wrapped to identify if any tampering with the container has occurred after inspection; and
    - 4 The stowed (checked) baggage containing the firearm is carried in an area that is inaccessible to passengers, and is not carried in the flight crew compartment.
  - (iii) Any unauthorized explosive or incendiary.
- (5) Ammunition, explosive or incendiary. This section does not prohibit the carriage of ammunition, explosive or incendiary in stowed (checked) baggage or in the same container as a firearm. Title 49 CFR part 175 provides additional requirements governing carriage of ammunition, explosive or incendiary on aircraft.
- (i) Control. Operators of DOE-Federal aircraft must use the procedures in the Field element's Site Safeguards and Security plan to control stowed (checked) baggage that it accepts for transport on an aircraft, in a manner that:
    - 1 Prevents the unauthorized carriage of any explosive or incendiary aboard the aircraft.
    - 2 Prevents access by persons other than an aircraft operator employee or its agent.
  - (ii) Refusal to transport. An operator of a DOE-Federal aircraft should refuse to transport any individual's stowed (checked) baggage or property if the individual does not consent to a search or inspection of that stowed (checked) baggage or property.
- (h) Acceptance and screening of cargo.
- (1) General requirements. Operators of DOE-Federal aircraft should use the procedures, facilities, and equipment described in the Field element's Site

Safeguards and Security plan to prevent or deter the carriage of unauthorized explosives or incendiaries in cargo onboard a DOE-Federal aircraft.

- (2) Screening of cargo. Operators of DOE-Federal aircraft must ensure that, as required in the Field element's Site Safeguards and Security plan, cargo is inspected for unauthorized explosives and incendiary before loading it on DOE-Federal aircraft.
- (3) Control. Operators of DOE-Federal aircraft must use the procedures in the Field element Site Safeguards and Security Plan to control cargo that it accepts for transport on DOE-Federal aircraft in a manner that:
  - (i) Prevents the carriage of any unauthorized explosive or incendiary aboard the aircraft.
  - (ii) Prevents access by persons other than an aircraft operator employee or its agent.
- (i) Refusal to transport. DOE-Federal aircraft operators must refuse to transport any cargo if the shipper does not consent to a search or inspection of that cargo.
- (j) Escorting personnel. Operators of DOE-Federal aircraft should develop and implement procedures for escorting and accompanying personnel in facilities that house, store, or where access could be gained to DOE-Federal aircraft.

**6. Remote (off-airport) Operations.** Operations within DOE often require deployment to small unfenced and unsecured airports or places that have no airport facilities at all. These operations pose a particular problem in implementing specific security plans or processes. The Field elements should evaluate the operational environment and potential risks to determine appropriate security measures.

- (1) Store aircraft in a locked or guarded hanger or facility (switching station)
- (2) Use devices as anti-tampering tape on doors, windows, ports, inspection plates and so on.
- (3) Change aircraft manufacturer's locks to high quality, professionally installed locks.
- (4) All avionics and removable items in the aircraft should be marked for positive identification (To ensure original item was not switched).
- (5) Consider installing anti-theft devices or alarms or removable wheel locks.
- (6) Preflight inspection should include efforts to detect foreign objects and evidence of tampering.

- (7) Ensure all personnel are positively identified that approach or work around the aircraft.

**7. Sites that do not have an established Site Safeguards and Security Plan.** Operators of DOE-Federal aircraft should conduct a risk analysis to determine the exposure the organization has to unauthorized access to Federal aircraft.

- (1) Protection programs should be tailored to address specific site characteristics and requirements, ongoing programs, and operational needs, to achieve acceptable protection levels that reduce inherent risks on a cost-effective basis.
- (2) Develop and implement a Site Plan to mitigate identified risk and exposure.
- (3) The Field element should refer to DOE O 470.1, SAFEGUARDS AND SECURITY PROGRAM, Chapter 1 as a guide to developing a site plan or contact the Director, Office of Security Policy for assistance.
- (4) All security plans should include security measures for different levels of security conditions (SeCON, Levels 1-5). Increased measures of security should be implemented as the security condition or threat increases.

**8. Applicable Standards**

49 CFR Chapter XII

DOE O 440.2B

DOE O 470.1



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## CHAPTER XXVII. ACQUISITION AND DISPOSAL OF AIRCRAFT

1. **Purpose.** The purpose of this chapter is to ensure that an adequate framework exists for establishing processes for the justification, cost analysis, and approval for the fleet modernization of DOE-Federal aircraft. In addition, to ensure the DOE program needs are met with a cost effective and efficient fleet of aircraft.
2. **Applicability.** This chapter contains procedures, processes, and systems acceptable for Departmental aviation services. The procedures of other Government agency aircraft, including those of the Department of Defense (DoD) that are not under DOE operational control, is the responsibility of the respective agency.
3. **General.** In 1999, the Secretary of Energy established the Office of Aviation Management to provide recommendations to the Secretary of Energy for the safe, efficient, and reliable management of aircraft used by DOE. The Director of the Office was the designated DOE Senior Aviation Management Official (SAMO), who should chair an Aviation Board of Directors and provides for the final approval for the acquisition and disposal of DOE aviation assets.
4. **Regulations.**
  - (a) The DOE aviation property management regulations are stated in 41 CFR part 102-33, the Federal Management Regulations. DOE/NNSA element managers with the authority to buy, lease, or charter, aircraft and aviation services should ensure that they are cognizant of these requirements.
  - (b) The authority for aircraft acquisition is enacted by the Congress in accordance with 32 USC 1343(d) and is found in the annual appropriation act for DOE.
5. **Accountability.**
  - (a) DOE-Federal aircraft are the property of the DOE program and Field element that is responsible for the accountability, operations, and maintenance of the aircraft.
  - (b) Each DOE-Federal aircraft acquisition whether by purchase, lease, transfer or forfeiture, with or without monetary costs, shall be justified by a cost comparison study conducted and documented in accordance with the requirements of OMB Circular A-11, Section 7 Exhibit 300 and Circular A-126 and DOE O 440.2B.
  - (c) Each contract for Commercial Aviation Services (GAS) in excess of ninety (90) or more days through an exclusive use contract, shall be justified by an approved cost comparison, conducted and documented in accordance with the requirements of OMB Circular A-11, Section 7 Exhibit 300 and Circular A-126 and DOE O 440.2B, as applicable.
  - (d) Replacement of a current DOE-Federal aircraft will be treated as an acquisition in accordance with the guidance in paragraphs 5. (b) and (c).

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**6. Responsibilities.**

- (a) Field elements and contractors:
  - (1) Provide funding estimates related to DOE-Federal aircraft and CAS acquisitions in a form and manner prescribed by the DOE Chief Financial Officer.
  - (2) Submit a copy of the funding estimate-to the Director, OAM.
  - (3) Submit an Exhibit 300, Business Case and Life-cycle Analysis document in the recommended format found in Chapter XXV of this guide to the Director, OAM for review and concurrence.
- (b) Field element Contracting Officers and DOE Aviation Managers: Review approved cost comparison documentation and recommendations and forward to the OAM.
- (c) Senior Aviation Management Official – Director, Office of Aviation Management:
  - (1) Reviews and approves the Exhibit 300 and Business case justifications for any acquisitions of federal aircraft or CAS in excess of ninety (90) days.
  - (2) Provides recommendations on Federal aircraft acquisitions or CAS in excess of ninety (90) days, as required by OMB Circulars A-11 and A-126, as applicable.

**7. Excess Aircraft and Parts.** Aircraft and aircraft parts that become excess to the needs of one DOE program or Field element may be reassigned within the Department with the concurrence of the DOE program official and the Director, Office of Aviation Management. Aircraft that are excess to the Department will be disposed of in accordance with DOE and Federal Management Regulations or successor regulations.

**8. Exchange Sale Waiver Process.** Organizations seeking to exchange sale aircraft and parts in accordance with 41 CFR Part 102-33, Federal Management Regulation will submit their request through the Office of Aviation Management for coordination with GSA and concurrence.

**9. Controls.** The DOE/NNSA element managers with assigned aircraft should ensure that internal controls are in place to prevent misappropriation, abuse or uneconomical use of aircraft. A copy of the policies or processes for internal controls should be filed with the Field element's Procurement Office and be available for review by the Director, Office of Aviation Management. Generally, these controls are found in the Field element's Aviation Implementation Plan and manuals.

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**10. Program Plans.** DOE program and Field elements should prepare Exhibit 300 and Business plans as required by DOE O 440.2B and the recommendations found in Chapter XXV of this guide. The business plans should evaluate:

- (1) Program goals effectiveness over the base year reported in the Exhibit 300 and the previous five years;
- (2) Current mission requirements versus future mission requirements;
- (3) Mission requirements versus current aircraft capabilities;
- (4) Current utilization versus future utilization;
- (5) Cost effectiveness of current aircraft;
- (6) Alternatives analysis; and
- (7) Cost benefit of acquiring newer or replacement aircraft.

**11. Cost Analysis.** DOE/NNSA program and Field elements must prepare and submit OMB Circular A-11 Exhibit 300, 20 year Life Cycle Cost analysis, and Cost Benefit analysis for review and concurrence by the OAM Director prior to submitting budget request for congressional approval for any new aircraft acquisitions, leases, transfers, or purchases.

**12. Applicable Standards**

Title 41 CFR part 102-33

OMB Circular A-126

OMB Circular A-11, Section 7 Exhibit 300 DOE O 440.2B

**13. Supplemental Guidance Documents**

GSA Personal Property Utilization and Disposal Guide

GSA Desk top Guide for Exhibit 300 Preparation

OAM Cost Benefit Excel Spreadsheets (Contact OAM)

Conklin and deDecker Life Cycle Cost Analyzer



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## CHAPTER XXVIII. AVIATION SAFETY AND MANAGEMENT AWARD PROGRAMS

1. **Purpose.** The purpose of the Aviation Safety and Management Award Program are to promote aviation safety and the effective management of DOE aviation programs by appropriate recognition of exceptional safety and management by individuals and groups.
2. **Applicability.** The Aviation Safety and Management Award Programs apply to all DOE employees and selected contractor personnel directly involved in aviation operations support to DOE.
3. **General.** DOE should recognize individuals and organizations for exceptional acts or service in support of safety, accident prevention, and management in the aviation program of the Department.
4. **Safety Awards Presented.** The following awards may be presented:
  - (a) Award for In-Flight Actions;
  - (b) Award for Accident-Free Flying;
  - (c) Award for Significant Contributions in Aviation Safety; and
  - (d) Secretary's Award for Outstanding Contributions in Aviation Safety.
5. **Safety Award Responsibilities**
  - (a) The OAM Director. The OAM Director will develop and administer the DOE Aviation Safety Awards Program and establish a DOE Aviation Safety Awards Committee.
  - (b) OAM ASO(s). The OAM ASO(s) should promote the program, develop and implement procedures for executing the program, and chair the DOE Aviation Safety Awards Committee.
  - (c) DOE/NNSA element ASO. Each DOE/NNSA element ASO should administer the Awards program within his/her DOE/NNSA element. Each ASO should promote the program and implement procedures to assist in the collection and verification of documentation submitted on behalf of nominees.
6. **Safety Award Administration**
  - (a) The OAM Director will administer the Award for In-Flight Actions; the Director OAM Award of Honor for Pilots and Aircrew Members within the category of the Award for Accident-Free Flying; the Award for Significant Contributions in Aviation Safety; and should provide technical and administrative support for

processing the Secretary's Award for Outstanding Contributions in Aviation Safety.

- (b) The Head of each DOE/NNSA element should administer the Award of Merit, the Award of Distinction, the Award of Excellence, and the Award of Honor for Pilots and Aircrew. Members within the category of the Award for Accident-Free Flying for his/her DOE/NNSA element.
- (c) Each Field element ASO should administer the Award for Accident-Free Flying for his/her Field element according to procedures which he/she establishes for each respective organization.

**7. DOE Aviation Safety Awards Committee.** The Awards Committee should consist of an OAM ASO as chairperson, and not less than four other individuals - at least two of whom should be current DOE or contractor pilots, and one current DOE or contractor maintenance inspector. The chairman should have the authority to call other individuals with particular expertise to assist the committee in nominee considerations. The duties of the Awards Committee shall be to verify the accuracy of information regarding the nominations for Award for In-Flight Actions, Award for Significant Contributions in Aviation Safety, Director OAM Award of Honor for Pilots and Aircrew Members within the category of the Award for Accident-Free Flying, and Secretary's Award for Outstanding Contributions in Aviation Safety. In addition, the Safety Awards Committee will assure the Director, OAM that the nominee(s) meet all of the requirements for the selected award.

**8. Procedures for Aviation Safety Awards.**

- (a) Nominations for the Award for In-Flight Actions, the Award for Significant Contributions in Aviation Safety, and the Secretary's Award for Outstanding Contributions to Aviation Safety should be submitted to the Chair, DOE Aviation Safety Awards Committee at the end of each calendar year. Nominations should be processed through the DOE Field element ASO for data verification, and reviewed for concurrence/non-concurrence by the appropriate supervisor. Nominations not properly processed and favorably endorsed should not be considered by the Awards Committee.
- (b) The chairman should convene the Awards Committee as required to review and forward recommendations to the OAM Director. The Committee should meet on call of the chairman, but not more often than once per calendar quarter.
- (c) The OAM Director should select awardees based on the Awards Committees recommendations. The OAM Director will have the final authority for selecting recipients for the awards for In-Flight Actions, and Significant Contributions in Aviation Safety. The OAM Director will review the qualifications of the nominees for the Secretary's Award for Outstanding Contributions in Aviation Safety.

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- 9. Safety Award for In-Flight Actions.** This award is established to recognize onboard crew members and personnel who, through outstanding airmanship, courage or other action, materially contribute to the successful recovery from an emergency, or who minimize or prevent aircraft damage or injury to personnel during an emergency situation. To be eligible for consideration, the circumstances of the occurrence should be documented to clearly show the skill, knowledge, judgment, technique, or courage demonstrated was of extraordinary or exemplary nature. This award is available to Federal and non-Federal individuals. The award is a gold colored wing lapel pin and appropriate certificate or wall plaque. The procedures to be followed:
- (a) Any person aware of outstanding performance by on-board personnel during an emergency situation may nominate one or more individual for an appropriate award. The nomination should contain a description of the event to include:
    - (1) Full name and duty (e.g., pilot, co-pilot, flight attendant, mechanic) of the individual being nominated, as well as other on-board personnel (e.g., passengers) who are being nominated.
    - (2) Name, address and telephone number(s) of other individuals having knowledge of the event.
    - (3) Date, time and location of the occurrence.
    - (4) Make, model and registration number of the aircraft involved.
    - (5) Project or mission being conducted at the time.
    - (6) Phase of flight when the emergency occurred, e.g.; hover, takeoff, climb, cruise, descent, approach to landing, autorotation.
    - (7) Kind of terrain over which the emergency occurred, e.g.; hills, trees, open water, rivers, mountains, tundra, etc.
    - (8) Description of the emergency landing area (if applicable) and of obstructions, and dimensions and photographs if possible.
    - (9) Environmental conditions; visibility, wind direction and speed, snow, rain, etc.
    - (10) Concise narrative description of the emergency from onset to termination.
    - (11) Action taken by the nominee(s) to cope with the emergency or minimize damage or injury. The circumstances surrounding the occurrence must be documented to show the skill, knowledge, judgment, and technique required and used in recovering from the emergency.

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- (b) An individual should not be considered for the award under the following conditions:
- (1) When it is self-induced;
  - (2) When it actually occurs during a simulated emergency requiring no added skill to land the aircraft successfully, e.g., an engine intentionally shut down on a multi-engine aircraft to practice single-engine procedures;
  - (3) When it occurs because of noncompliance with published regulations, procedures or policy guidance, e.g., deviation from a preplanned and approved non-special use activity to a low-level flight which results in a wire strike and emergency landing; engine failure due to fuel starvation as a result of poor preflight planning and fuel management, etc.;
  - (4) When it is determined that no emergency actually existed; and
  - (5) When, in the committee's opinion, a lack of discipline or individual judgment may have induced the emergency.

**10. Award for Accident-Free Flying.** This award should be established to recognize DOE pilots and aircrew members and DOE-contractor pilots and aircrew members who have distinguished themselves by flying accident-free for the period considered.

- (a) Safety Award for Accident-Free Flying Standards:
- (1) If an individual has been involved in an aircraft accident where pilot error or negligence was a causal or contributing factor, that individual should be ineligible for consideration for any years prior to the accident.
  - (2) All dates of computation for these awards should begin on the day the employee was placed on status as a pilot or as an aircrew member or the day after an aircraft accident, whichever is the most recent. A copy of this authorization or other substantive documentation should be submitted with the nomination.
- (b) Safety Award for Accident-Free Flying Criteria:
- (1) Professional, dual function, incidental pilot, or professional aircrew member or qualified non-crewmember as determined by employment status.
  - (2) Only flight crewmember flight hours or all flight hours logged while serving as an aircrew member or qualified non-crewmember as determined by employment status should be considered for this award.



- (3) Aviation managers include managers at sites with DOE-Federal aircraft and those sites that only use Commercial Aviation Services.
- (4) Dates of consideration need not be consecutive. However, dates should not be omitted to avoid identification of a chargeable accident.

**11. Safety Award Categories.**

(a) Award Categories for Pilots:

- (1) Award of Merit - Five years or 1,500 hours of accident-free flying.
- (2) Award of Distinction - Ten years or 3,000 hours of accident-free flying.
- (3) Award of Excellence - Fifteen years or 5,000 hours of accident-free flying.
- (4) Award of Honor - Twenty years or 7,500 hours of accident-free flying.
- (5) The OAM Director Award of Honor -More than 25 years or more than 10,000 hours of accident-free flying. (Presented by the OAM Director).

(b) Award Categories for Aircrew Members and Qualified Non-crewmembers:

- (1) Award of Merit - Five years of accident-free flying.
- (2) Award of Distinction - Ten years of accident-free flying.
- (3) Award of Excellence - Fifteen years of accident-free flying.
- (4) Award of Honor - Twenty years of accident-free flying
- (5) The OAM Director Award of Honor -More than 25 years of accident-free flying. (Presented by the Director, OAM)

(c) Award Categories for Aviation Managers:

- (1) Award of Merit - Five years of accident-free flight activities for the unit managed.
- (2) Award of Distinction - Ten years of accident-free flight activities for the unit managed.
- (3) Award of Excellence - Fifteen years of accident-free flight activities for the unit managed.
- (4) Award of Honor - Twenty years of accident-free flight activities for the unit managed.

- \*5) The OAM Director Award of Honor - More than 25 years of accident-free flight activities for the unit managed. (Presented by the Director, OAM).

12. **Procedures.** Each DOE/NNSA element should nominate its own pilots or aircrew members for consideration. Each nomination should include:
  - (a) A statement of verification of eligibility by the DOE/NNSA element ASO.
  - (b) Full name, FAA Airman's Certificate Number or employee identification number.
  - (c) Pilot status (e.g., GS-2 181 professional pilot, dual function or incidental) or aircrew member or qualified non-crewmember status. If the pilot's status is "incidental", a Letter of Authorization for the years being considered should be included.
  - (d) Period of consideration and total number of accident-free flying hours attained.
13. **Exceptions.** For the purpose of these awards, any incident where (1) pilot, aircrew member or qualified non-crewmember error or (2) pilot, aircrew member or qualified non-crewmember negligence resulted in damage to an aircraft or injury to personnel, or an aviation hazard where any careless or reckless operation by the pilot, aircrew member or qualified non-crewmember has been verified should be cause for non-selection. An accident occurring as a result of a material failure or other such circumstances where it is clearly established and documented that the pilot, aircrew member or qualified non-crewmember was non-contributing should be considered an exception. For nominations which include an exception, the circumstances should be fully documented as an enclosure to the nomination. Decisions made relative to exceptions should be final.
14. **Award for Significant Contributions in Aviation Safety.** This award is established by the OAM Director to recognize an individual, group or organization for outstanding contribution in aviation safety or aircraft accident prevention within DOE. This award should be available to Federal and non-Federal individuals, groups or organizations.
  - (a) Standard. Any individual having knowledge of the significant contribution may submit a nomination to the Director, OAM.
  - (b) Criteria:
    - (1) The circumstances being presented should clearly demonstrate a significant contribution to aviation safety or aircraft accident prevention effort within the DOE.
    - (2) The circumstances being considered should be verified and attested to for the substance and accuracy of the proposal by individual(s) other than those being considered for the award.

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- (3) The basis for final selection for issuance of this award rests with the recommendations of the Awards Committee to the Director, OAM for final approval.
  - (c) Awards. Individuals, groups, or organizations should be recognized by the presentation of a certificate and an appropriate memento from the Director, OAM.
  - (d) Procedures:
    - (1) Nominations for this award should be in narrative form, clearly identifying in detail, the act or service to be considered and why the act or service is deserving of recognition.
    - (2) Nominations should be submitted through the appropriate DOE/NNSA element ASO for data verification and for endorsement prior to being forwarded to the Director, OAM.
    - (3) The Awards Committee will evaluate the nominations for eligibility against stated criteria and, where possible, verify the justification provided. Each nomination should be forwarded to the OAM Director for final review and action, with recommendations from the Committee.
    - (4) Awards presentation should be determined by the Director, OAM.

**15. Secretary's Award for Outstanding Contributions in Aviation Safety.** This award is established to recognize an individual or group for outstanding contribution in aviation safety or aircraft accident prevention within DOE. This award is available to DOE and non-Federal individuals, groups, or elements. Only one such award should be available annually.

- (a) Standard:
  - (1) Individual or group contribution did not occur during an in-flight emergency (see section entitled "Award for In-Flight Action").
  - (2) Any individual having sufficient knowledge of the contribution may submit a nomination.
- (b) Criteria:
  - (1) The circumstances being considered should clearly demonstrate an outstanding contribution in aviation safety or aircraft accident prevention within DOE.
  - (2) The circumstances being considered should be verified and attested to for the substance and accuracy of the proposal by individual(s) other than those being considered for recognition.

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- (c) Awards:
- (1) Individual(s). Individuals should be recognized by presentation of a certificate signed by the Secretary of Energy, and an appropriate memento.
  - (2) Group(s). Groups should be recognized by presentation of a certificate signed by the Secretary of Energy, and an appropriate memento to the group. Individual awards should not be presented to members of a group.
- (d) Procedures:
- (1) Nominations for this award should be in narrative form, clearly identifying in detail, the act or service to be considered and why the act or service is deserving of recognition.
  - (2) Nominations should be submitted through the appropriate ASO for review and endorsement prior to being forwarded to the Director, OAM.
  - (3) The DOE Aviation Safety Awards Committee should evaluate the nominations for eligibility against stated criteria and, where possible, verify the justification provided. Each nomination should be forwarded to the OAM Director for review with recommendations from the Committee.
  - (4) The OAM Director should review each nomination, consider the recommendations of the Awards Committee and make a recommendation to the Secretary of Energy for selection. Non-selected nominations should be returned to the DOE/NNSA element ASO for consideration for presentation as a DOE organizational award.
  - (5) The Director, OAM should apprise the Secretary of Energy of the selectee for recognition and arrange for the presentation by the Secretary.
- 16. DOE Organizational Aviation Safety Awards.** Heads of DOE/NNSA elements are encouraged to establish an awards program for recognizing individuals or groups for their contribution to their organization's aviation safety and aircraft accident prevention effort. The awards should be in addition to those described herein.
- 17. Aviation Management Awards Program.** The Office of Aviation Management (MA-30) annually sponsors three agency-wide Aviation Management awards; the Aviation Program Award, the Aviation Management Professional Award, and the Operations/Support Professional Award. The program goal is to promote continuous improvement of DOE aviation management by publicly recognizing and rewarding our best organizations and individuals. The improved contributions of our aviation assets will, in turn, enhance the efficiency and effectiveness with which the entire Department accomplishes its missions.

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- (a) Nominations should describe how excellence in Aviation Management has contributed to the success of Department missions. The Field element should describe outstanding management practices in any/all areas, to include: administration, operations, maintenance, training, and safety.
  - (b) These awards can promote continuous improvement in DOE aviation management, but success will depend on your participation. OAM must receive the Field elements nominations, by the first week of April for activities during the preceding calendar year.
  - (c) All DOE/NNSA elements that own or use CAS aircraft to perform their missions may submit nominations for the following aviation excellence awards. Neither the Office of Aviation Management, nor any of its assigned members, may be eligible for these awards.
  - (d) Aviation Program Award:
    - (1) The Department will annually present this award, and a “traveling” trophy, to the best overall Aviation Program. The winning organization may display the trophy until its return to OAM for the award ceremony the following year. As permanent non-monetary awards, DOE will also present individual plaques to each member of the winning team. Judges may also award an Honorable Mention award, when and where appropriate.
    - (2) To specifically recognize organizations that directly manage aviation programs, this will be a field-level award. Headquarters-level personnel may be recognized as part of the winning team, but the award will go to the field organization. The winning program will be selected as described in the Nomination Criteria section below.
  - (e) Aviation Management Professional Award. The Department will annually present a trophy and a cash award, the amount to be determined by the Senior Aviation Management Official, to its best aviation management professional. Anyone may nominate any Field-level Federal employee whose primary duties support a flight program. Nominations should be forwarded through the Field element’s Aviation Manager with endorsement as appropriate. In addition to the cash award and a personal trophy, the winner’s name will also be engraved on a permanent trophy that may also be displayed by the winner’s organization until the award ceremony for the following year.
  - (f) Operations/Support Award. This award will be given to the best Aviation Professional in an operational or support crew position. Organizations may nominate any federal or contract employee at the field level, whose primary duties support a non-military Federal flight program. The winner will be the individual whose operational or support skills and accomplishments contributed in the most

outstanding manner to improving or sustaining the safety, efficiency, and effectiveness of one or more aspects of his or her agency's Federal flight program and/or CAS program.

- (g) The judges may also award Honorable Mention (with no monetary awards attached) the three award categories, if appropriate.

**18. Process (How to Submit Nominations For Management Awards).**

- (a) Submit a nomination form for each award management award category, signed by an authorizing official. The authorizing official for an Aviation Management Program Award, will be the Federal official one supervisory level above the aviation program, if applicable. The immediate supervisor of any field-level Federal employee whose primary duties support a flight program will be the authorizing official for the DOE Aviation Management Professional or Operations/Support Professional Awards.
- (b) Please attach a one-to-four page narrative to each nomination, describing how your program or professional meets the criteria. Annually submit nominations by mail, email, or facsimile by the first week of March for activities in the preceding calendar year to the following addresses:

By email: [David.Lopez@hg.doe.gov](mailto:David.Lopez@hg.doe.gov)

By facsimile: (202) 586-6008

By Mail: Attn: David N. Lopez, ME-30, Rm. 4B-218

Senior Aviation Policy Officer

Office of Aviation Management

Phone: (202) 586-6177

**19. Criteria for Management Awards.** An independent panel will judge the entries, and DOE will present awards in each category. OAM will also submit the winners as the DOE candidates for the General Services Administration (GSA) Federal Aviation Program and Federal Aviation Professional awards.

- (a) The Aviation Management Program Award Winner will demonstrate the most outstanding achievements in the categories below. Although the judges will be evaluating for the best over-all program, a program that is truly exceptional in only one (or a few) categories will still be considered.
- (b) The Aviation Management Professional Award Winner will be the individual judged to have contributed in the most outstanding manner to the safety, efficiency, and effectiveness of one or more aspects of a Federal flight program.

- (c) Operations/Support Professional Award will be individual whose operational or support skills and accomplishments contributed in the most outstanding manner to improving or sustaining the safety, efficiency, and effectiveness of one or more aspects of his or her agency's Federal flight program and/or CAS program.

**20. Areas to Address in the Nomination.** (Note: Under each category below are some questions for a person to think about when preparing a nomination. A person does not have to answer all these questions in each nomination.) These criteria apply to both owned (Federal) and hired Commercial Aviation Services (CAS) aircraft.

- (a) **MANAGEMENT and ADMINISTRATION:** Activities related to general management and leadership of an aviation program, which include managing an organization and its personnel; acquiring, managing, and disposing of aircraft and related parts, equipment, and facilities; budgeting and financial management; contracting; developing and enforcing policy/standards; implementing and enforcing compliance with headquarters-level directives; and developing and administering tracking and reporting systems.
  - (1) What are your performance measures for program management? Have you met or exceeded them? Have you streamlined your program? Have you taken administrative actions that have saved money, time, and energy? What new business practices have you instituted to improve the safety, effectiveness, and efficiency of your program? Have you done something exceptional in property management (i.e., exchange/sale, excess)? Have you developed or improved an information management system? Have you done fleet planning/A-11 Exhibit 300 studies? Have you set up contracts to acquire new aircraft? Have you adopted innovative safety standards or guidelines and implemented standards and a program to enforce them? How have your achievements in management administration improved your agency's mission-effectiveness?
- (b) **OPERATIONS:** Activities related to flight operations, which include scheduling; dispatch; piloting; crewmember duties; responsibility for emergency procedures and equipment; and other responsibilities related to an aircraft in flight.
  - (1) What are your performance measures for operations? Have you met or exceeded them? Did your pilots and crewmembers accomplish anything extraordinary in the calendar year? Has your program done anything innovative in the areas of scheduling and dispatch? What significant improvements did you make in your flight operations last year? How have your achievements in flight operations improved your agency's mission effectiveness?
- (c) **MAINTENANCE:** Activities related to maintaining aircraft and related parts and equipment, which include scheduled and unscheduled maintenance;

modifications; repair and rework (organizational level, intermediate level, or depot level); parts acquisition and management; and facilities management.

- (1) What are your performance measures for maintenance? Have you met or exceeded them? Have you recently established a new, money or timesaving method for maintenance? Have any of your maintenance personnel gone “above and beyond” in carrying out their duties? Have you instituted improvements in inventory control management of parts/equipment? How have your achievements in maintenance improved your agency’s mission effectiveness?
- (d) TRAINING: Activities related to training for all aviation program personnel, which include initial and recurrent training for management and administrative personnel, operational personnel (such as pilots and crew members), maintenance personnel, aviation safety officers, and functional personnel who do their jobs while flying but are not necessarily aviators.
- (1) What are your performance measures for training? Have you met or exceeded them? Have you established a new program or reorganized an old one? Did training enable your personnel to perform in an exceptional manner? How have your achievements in training improved your agency’s mission effectiveness?
- (e) SAFETY: Activities related to ensuring safety throughout your aviation program, on the ground, in the air, and in training, which include programs for risk analysis and risk management; internal and external assessments/inspections and enforcement of safety standards (including Aviation Resource Management Surveys (ARMS)); systems for tracking, reporting, and communicating hazards, incidents, accidents, and accident prevention information; and safety awards programs.
- (1) What are your safety performance measures? Have you met or exceeded them? Have you maintained an outstanding safety record under high risk and challenging circumstances? What enabled this achievement? Have you learned from an accident? How are you putting into practice what you’ve learned? How have your achievements in ensuring safety improved your agency’s mission effectiveness?
- (f) In your nomination narratives, please address each of the applicable categories above, using specific examples and quantitative measures. In each area, describe how the nominee’s policies, practices, and accomplishments contributed to improved safety, more efficient management, and better mission effectiveness. Nominations for the Aviation Program Award should include a listing of the program team’s personnel and a brief description of the program number of aircraft owned or hired, mission, maintenance strategy, etc.. Nominations for the



Aviation Management Professional and Operations/Support Professional Awards should include brief biographical information.

- (g) Nomination Forms: Go to the DOE Aviation homepage at <http://management.energy.gov/aviation.htm> to retrieve a nomination form. Once the nomination form has been downloaded, type your information. Use a separate form for each nomination. **The Director, MA-30 must receive entries not later than the first week of March.** Please attach to each form up to four pages of justification discussing the above criteria.

**21. The Awards Ceremony.** The Secretary of Energy, or his designated representative, will recognize all winners and present all awards at the Annual Aviation Operations and Safety Training Workshop following the nomination cycle, or at the time and place designated by the Director, Office of Aviation Management.

**22. Applicable Standards**

Title 41 CFR part 102-33

DOE O 440.2B

**23. SUPPLEMENTAL GUIDANCE DOCUMENTS**

ICAP Management and Professional Award Program



## CHAPTER XXIX. AVIATION PERFORMANCE INDICATORS

1. **Purpose.** The purpose of this Chapter is to refer personnel to DOE G 440.2B-1, Aviation Performance Indicators.
2. **Applicability.** This chapter contains reporting procedures and systems acceptable for Departmental aviation services. The reporting procedures of other Government agency aircraft, including those of the Department of Defense (DoD) that are not under DOE operational control, is the responsibility of the respective agency.
3. **General.** Refer to DOE G 440.2B-1, Aviation Performance Indicator for guidance on the implementation of APIs required by DOE O 440.2B.



**DOE Form 1300-3**

DOE F 1300.3 (01-94)		<b>U.S. DEPARTMENT OF ENERGY</b> <b>DOCUMENT IMPROVEMENT PROPOSAL</b> <i>(Instructions on Reverse)</i>		OMB Control No. 1910-0900 OMB Burden Disclosure Statement on Reverse	
1. Document Number		2. Document Title			
3a. Name of Submitting Organization			4. Type of Organization ( <i>Mark one</i> ) <input type="checkbox"/> Vendor <input type="checkbox"/> User <input type="checkbox"/> Manufacturer <input type="checkbox"/> Other (Specify: _____)		
3b. Address ( <i>Street, City, Zip Code</i> )					
5. Problem Areas ( <i>Attach extra sheets as needed.</i> )					
a. Paragraph Number and Wording					
b. Recommended Wording					
c. Reason/Rationale for Recommendation					
6. Remarks					
7a. Name of Submitter ( <i>Last, First, MI</i> )			7b. Work Telephone Number ( <i>Include Area Code</i> )		
7c. Mailing Address ( <i>Street, City, State, Zip Code</i> )			8. Date of Submission		





## ACRONYMS

AD	Airworthiness Directives
AGL	Above Ground Level
AIB	Accident Investigation Board
AAIRS	Aviation Accident and Incident Reporting System or process
ASD	Aviation Safety Document
ASO	Aviation Safety Officer
ATC	Air Traffic Control
AvM/APM	Aviation Manager
CAS	Commercial Aviation Service
CFR	Code of Federal Regulations
DLAM	Defense Logistic Agency Manual
DOE	Department of Energy
ETA	Estimated Time of Arrival
ETE	Estimated Time Enroute
FAA	Federal Aviation Administration
FAIRS	Federal Aviation Interactive Reporting System
FAR	Federal Aviation Regulation
FSDO	Flight Standards District Office
GSA	General Services Administration
IFR	Instrument Flight Rules
IMC	Instrument Meteorological Conditions
MEA	Minimum Enroute Altitude
MEL	Minimum Equipment List
MOPS	Minimum Operational Performance Standards
MSA	Minimum Safe Altitudes
NAS	National Airspace System
NTSB	National Transportation Safety Board
NVG	Night Vision Goggles
OAM	Office of Aviation Management
OPM	Office of Personnel Management
OMB	Office of Management and Budget
ORPS (DOE)	Occurrence Reporting and Processing System
OSHA	Occupational Safety and Health Administration
PIC	Pilot-in-command
PMA	Power Marketing Administration
RTCA	Radio Technical Commission for Aeronautics
SFAR	Special Federal Aviation Regulation
SIC	Second-in-Command
SID	Standard Instrument Departure
UA	Unmanned Aircraft
UAS	Unmanned Aircraft System
VFR	Visual Flight Rules





## DEFINITIONS

**Aerial Applications.** The dispensing of nonpoisonous cargo during flight from a Government aircraft to accomplish a specific purpose on the ground, e.g., to extinguish a forest fire, fertilizing, seeding.

**Abandoned Aircraft.** An aircraft located in a remote area where recovery is impossible or impractical (such as an aircraft lost at sea).

**Aerial Patrol Crew.** The pilot and one qualified non-crewmember. An additional qualified non-crewmember may be carried for a valid mission need with the approval from the designated person in that organization and the pilot. The person should be required to wear the appropriate protective equipment. The aircraft must be within weight and balance limitations with the additional personnel.

**Aircraft.** A device that is used or intended to be used for flight in the air.

**Aircraft Accident.** An occurrence associated with the operation of an aircraft that takes place between the time any individual boards the aircraft with the intention of flight and when all such individuals have disembarked and when any individual suffers death or serious injury or the aircraft receives substantial damage as described in 49 CFR Part 830. When two or more aircraft are involved in an accident, the aircraft with the most substantial damage should be used to determine the accident classification.

**Aircraft Mishap.** An aircraft accident or incident.

**Article.** An airframe, powerplant, propeller, instrument, radio, or accessory.

**Aviation Concern.** A concern is any act or set of circumstances that is perceived by an individual as having a serious potential for compromising safety that may lead to an aircraft accident or incident. Because aviation concerns involve perceptions, it is the responsibility of the aviation safety staff to determine the validity of the concern.

**Aircraft Incident.** An occurrence other than an accident associated with the operation of an aircraft that could affect the safety of operations, as described in 49 CFR Part 830. Examples of incidents are:

- An injury reportable under OSHA regulations requiring first aid or medical attention; or
- Any damage less than substantial when engines/rotors are turning and there is an intent to fly;

**Forced Landing:** A landing necessitated by failure of engines, systems or components that makes continued flight impossible and which may or may not result in damage;

**Precautionary Landing:** A landing necessitated by apparent impending failure of engines, systems or components that makes continued flight inadvisable;

**Aircraft Ground Event:** A mishap in which there is no intent to fly; however, the damage incurred requires replacement or repair of rotors, propellers, wheels, tires, wing tips, flaps, etc.; or an injury reportable under OSHA regulations is incurred requiring first aid or medical attention; or

**Near Mid-Air Collision:** An unplanned incident associated with the operation of an aircraft in which a possibility of collision occurs as a result of proximity of less than 500 feet to another aircraft; or a report is received from a pilot or flight crewmember stating that a collision hazard existed between two or more aircraft.

**Accepted Commercial Aviation Services.** A commercial aircraft service provider that has been reviewed by representatives of the Department, Wyvern, LLC, ARG/US, or DoD and found to meet the safety and operational standards established by the Department for aviation operations. A list of accepted commercial aircraft service providers may be found on the OAM website <http://management.energy.gov/aviation.htm> in the Aircraft Operator Data Lists maintained by OAM. DOE-Federal aircraft are included in this list; however, regularly scheduled domestic airlines are not reviewed by the Department and are not included in the Accepted Operator Data List.

**Approving Official.** An individual delegated the authority to approve planned official travel within an office or division and who determines that the travel is necessary and that funds are available.

**Aviation Hazard.** A condition, act, or set of circumstances that compromises the safety of personnel or resources engaged in aviation activities. Such conditions include inadequacies, deficiencies, and unsafe practices pertaining to all aspects of aviation operations activities.

**Aviation implementation plan (AIP).** A written document prepared to identify the program's management roles, responsibilities, authorities, practices, procedures, and other actions necessary to implement aviation operations in compliance with all applicable laws, regulations, orders, and requirements and in a manner commensurate with the hazards associated with the particular workplace, including the schedules for implementing such actions to achieve compliance, if necessary. The AIP may be in any form that is logical in its presentation, such as an aircraft operations manual, field notice, policy, order, etc..

**(Aircraft) Incident.** An occurrence associated with the operation of an aircraft, other than an accident, that affects or could affect the safety of operations.

**Beyond Visual Range.** In regards to UAS activities means (1) a distance that exceeds the ability of a pilot or observer to maintain visual contact with the UAS or (2) a distance that exceeds the pilot's control station to transmit and receive data to and from the aircraft's receiver/transmitter directly, without a communications relay, satellite or otherwise.

**Catastrophic Failure.** Any failure that leads to loss of the a manned or unmanned aircraft and endangers people and/or property.

**Charter Aircraft.** An aircraft operated and maintained by a commercial aviation service provider that is hired by an executive Agency under a contractual agreement specifying performance and a one-time exclusive use.

**Chase aircraft.** A manned aircraft flying in close proximity to Unmanned Aircraft (UA) that carries a qualified observer and/or UA pilot.

**Communications Line-of-Sight.** In regards to UAS activities means the capability of the pilot's control station to directly transmit and receive signals to and from the UAS.

**Component.** A part of a product or article.

**Conditional Life Parts.** Components that may continue in service as long as they meet the inspection limits of the original design established by the manufacturer and are accepted by the FAA. The tests to determine if a component will continue in service include precision measurements and/or nondestructive testing.

**Configuration.** The airframe and installations that comprise the aircraft at the start of flight including the powerplant, propeller, landing gear, airframe, navigation, flight control systems, mission equipment, subsystems or parts.

**Cooperative aircraft.** Aircraft that are being tracked by Air Traffic; or, an aircraft that has an electronic means of identification (i.e., a transponder) aboard.

**Critical Failure.** Any failure that leads to manned or unmanned aircraft flight interruption or termination.

**Critical System.** A system or systems which if malfunctioned would lead to a critical failure.

**Commercial Aviation Services.** Include the following:

- (1) aircraft leased;
- (2) aircraft chartered or rented for exclusive use;
- (3) full services (i.e., aircraft maintenance providers, aircraft, and related aviation services for exclusive use) contracted for or obtained through an inter-service support agreement (ISSA), regardless of the length of the contract or agreement; or
- (4) aviation services (i.e., services but not aircraft) obtained by commercial contract or ISSA, except those services acquired to support a fleet aircraft.

**Crewmember.** As used in the guide, a crewmember can be either a person assigned to operate or assist in operating a Government aircraft during flight time. Crewmembers perform duties directly related to the operation of the aircraft (e.g., as pilots, co-pilots, flight engineers, navigators) or duties assisting in the operation of the aircraft (e.g., as cabin safety specialists,

crew chiefs). However, generally within industry crewmember means a cabin safety specialist or flight attendant.

DOE/NNSA element. Any of the following: Program Secretarial Offices, Power Marketing

Administrations, National Nuclear Security Administration, Operations Offices, Special Projects Offices, National Laboratories, etc., that are part of the United States Department of Energy. As used in the Guide this term is commonly used to reference both the Headquarters and Field elements.

DOE/NNSA Field element. Any of the following: Operations Offices, Site Offices, Service Centers, Power Marketing Administrations, Special Projects Offices, National Laboratories, etc., that are part of the United States Department of Energy. As used in the Guide this term is commonly used in reference to an organization other than a Headquarters element.

DOE-Federal aircraft. An aircraft that is owned, leased, leased purchased or borrowed from another agency in use by DOE.

Endorse. Accept, approve; review, or comment.

Equivalent Level of Safety (ELOS). ELOS findings are made when literal compliance with a certification or operational regulation cannot be shown and compensating factors exist which can be shown to provide an equivalent level of safety.

Federal Aircraft. An aircraft that an executive Agency owns, bails, or borrows from an Executive Agency for any length of time.

Flight Crewmember. A pilot, flight engineer, flight navigator or cabin safety personnel assigned to duty in an aircraft during flight time.

Flight Readiness Review Board. A body of experts that advises Departmental managers on the hazards of a proposed aviation operation.

Ground Control Station. Means air-, land-, or sea-based control center that provides the facilities for human control of unmanned aircraft in the air or in space.

Ground Safety Officer. Means a DOE Federal or contract employee designated to oversee and assess the safety of ground and/or flight operations in accordance with applicable policies and procedures for ground or flight activities.

Government Aircraft. Any DOE-Federal aircraft or Commercial Aviation Service aircraft leased, chartered, or rented by of an executive Agency other than a branch of the Armed Forces or an intelligence agency.

Incidental Pilot. A full-time Federal employee of DOE that is responsible for managing and operating DOE Federal aircraft; is assigned as an aviation management or safety professional that is responsible for the direct management or oversight of DOE Federal aircraft with a

position description other than a GS-2181, Pilot; and is qualified and proficient to act as a flight crewmember performing flight crew member duties.

**Lost Link.** Means the operator's control station or the unmanned aircraft system has lost the ability to transmit and receive data to and from the unmanned aircraft.

**Lost Link Procedure.** A means or procedure for automatic recovery of the aircraft in the event of a lost link such as a means of automated or pre-programmed auto-pilot/navigation maneuvers to regain positive control or safely terminate the aircraft flight.

**Mission Personnel.** Are either flight crew members, crew members or qualified non-crewmembers, see definitions.

**Mission Requirements.** In relation to use of Government aircraft at the Department of Energy, means activities that constitute the discharge of the Department's official responsibilities. Examples of Mission requirements include, but are not limited to: Aerial Survey, such as atmospheric sampling, biological surveys, radiological surveys, natural resource management, oceanic, atmospheric, and geological research, etc.; Aerial Photography, for consequence management, decommissioning of facilities, construction, law enforcement, etc.; Aerial Patrols, such as law enforcement and intelligence activities, power line patrols, pipeline patrols, security, search and rescue, etc.; Transportation, such as transportation of prisoners, detainees, illegal aliens, mission personnel, fire fighting, rescue operations, cargo, etc.; Research and Development such as aeronautical and space research, aerial sensor development, etc.; Rotorcraft External Load operations such as fire fighting, agriculture management, construction, etc.; Training such as flight or mission crew training.

**Maintenance Deficiency.** A serious defect or failure causing mechanical difficulties encountered in aircraft maintenance or flight operations, not specifically identified as an incident, or aviation hazard.

**Medical Attention.** An injury, less than serious, for which a physician prescribes medical treatment and makes a charge for this service.

**Missing Aircraft.** An aircraft not accounted for when its fuel duration as reported on its request for flight following or on its flight plan has been exceeded and the location of the aircraft is unknown.

**Non-cooperative aircraft.** Aircraft that are not being tracked by Air Traffic Control; or, an aircraft that does not have an electronic means of identification (i.e., a transponder) aboard.

**Non-Federal traveler.** Means an individual who travels on a Government aircraft, but is not a Federal traveler. Dependents and other family members of Federal travelers who travel on Government aircraft are considered to be non-Federal travelers within this regulation.

**Operational Control.** With respect to flight, the exercise of authority over initiating, conducting, or terminating a flight this term is associated with air carriers and commercial operators operating under 14 CFR parts 121, 125, or 135.

**Overhaul.** The complete disassembly, cleaning, inspection, necessary replacement or repair of components, reassembly, adjustment, and testing of an article or product in accordance with the manufacturer recommended maintenance procedures and/or FAA approved continuous airworthiness maintenance program. Once a component or article is overhauled, it is returned to service as zero time since overhaul and the next overhaul cycle starts.

**Official Travel.** Means (i) travel to meet mission requirements, (ii) required use travel, and (iii) other official travel.

**Other Official Travel.** Means official travel to attend meetings, conferences, give speeches, or for routine site visits or to attend training not associated with the operation of an aircraft or duties on-board an aircraft..

**Passenger.** Any individual on-board an aircraft who is not a flight crewmember, crewmember, or qualified non-crewmember.

**Positive Control.** In regards to Unmanned Aircraft System activities means the capability of the pilot or auto pilot system to maintain control of the flight path, orbit, altitude, airspeed, or flight plan with the outcome of the maneuver never in doubt.

**Product.** An aircraft, airframe, aircraft engine, propeller, or appliance.

**Propulsion System.** A system comprised of those components necessary to ensure the safe propulsion of the aircraft.

**Qualified non-crewmember.** A person flying onboard a Government aircraft whose skills, duties or expertise are essential to performing or directly associated with performing the Governmental mission requirement for which the aircraft was dispatched. Qualified non-crew members may be researchers, flight directors, electronics technicians, system operators, photographers, law enforcement agents, fire fighters, agricultural engineers, emergency medical personnel, biologists, etc.

**Required Use Travel.** Travel of an executive agency officer or employee for which the use of Government aircraft is required to meet bona fide communications or security needs of the Agency or exceptional scheduling requirements. An example of a bona fide communications requirement is having to maintain continuous 24-hour secure communications with the traveler. Bona fide security requirements include, but are not limited to, life threatening circumstances. Exceptional scheduling requirements include emergencies and other operational considerations, which make commercial transportation unacceptable.

**Repair.** The restoration of a component or article of a product to a serviceable condition after fault detection. Note: A repair does not constitute an overhaul; a component or article may be repaired but it does not necessarily start the overhaul cycle over.

**Retirement Life Parts.** Life-limited components that a manufacturer and the FAA have determined to be life limited either by cycles (frequency), flight hours or calendar time. Such a component may fatigue or fail if not removed from service at the designated life limit. Life-

limited components are described and listed in the Type Certificate Data Sheet or by Airworthiness Directive.

**Scheduled maintenance.** Maintenance activity, including parts and labor, that is scheduled based on accumulated flight hours, cycles, and/or calendar event, including reoccurring airworthiness directives or manufacturer mandatory service bulletins that require maintenance by accumulating flight hours, cycles, or calendar time.

**Senior Federal official.** Means an individual who is paid according to the Executive Schedule established by 5 U.S.C. 53, Subchapter II, including Presidential appointees who are confirmed by the Senate; employed in the U.S. Government's Senior Executive Service or an equivalent "senior" service; who is a civilian employee of the Executive Office of the President; who is appointed by the President to a position under section 105(a)(2)(A), (B), or (C) of title 3 U.S.C. or by the Vice President to a position under section 106(a)(1)(A), (B), or (C) of title 3 U.S.C; or who is a contractor working under a contract with an executive agency, is paid at a rate equal to or more than the minimum rate for the Senior Executive Service, and has senior executive responsibilities. The term senior Federal official, as used in the Federal Travel Regulation does not mean an active duty military officer.

**Serious Injury.** An injury that when determined by a physician causes death or:

- 1) Requires hospitalization for more than 48 hours.
- 2) Results in a fracture of any bone (except simple fractures of fingers, toes, or nose).
- 3) Involves lacerations that cause severe hemorrhages, or nerve, muscle, or tendon damage.
- 4) Involves injury to any internal organ; or involves second or third degree burns, or any bums affecting more than 5% of the body surface.

**Substantial Damage.** Any damage or structural failure that adversely affects the structural strength, performance, or flight characteristics of the aircraft and that would normally require major repair or replacement of the affected components. Examples of major components are:

- 1) Wing panels (exclusive of wing tip, flight control surfaces, high-lift devices, and aerodynamic braking devices).
- 2) Wing center sections (exclusive of flaps and aerodynamic braking devices).
- 3) Fuselages or major sections (exclusive of doors, hatches, windows, astrodomes, aerodynamic braking devices).
- 4) Vertical stabilizer (exclusive of rudder).
- 5) Horizontal stabilizer (exclusive of elevator).
- 6) Flying tail, slab tail, stabilator, or similar device.

- 7) Landing gear strut assemblies incurring structural airframe damage (exclusive of wheels, brakes, tires, outriggers, or protective gear, helicopter skids).
- 8) Main floats.
- 9) Helicopter main rotor heads and power train components (exclusive of main and tail rotor blades).
- 10) Tail booms or empennages (exclusive of tail rotor protective devices and tail rotor drive shaft covers).

**Sponsoring Agency.** A U.S. Government Agency with primary responsibility for the mission under which the travel was initiated.

**Supplemental Pilot.** A pilot that is not a permanent (full-time) employee of the DOE or the contractor responsible for managing and operating Federal aircraft, who is hired on a temporary basis to augment an organization's flight operations.

**Tier I Unmanned Aircraft.** A powered unmanned aircraft with a gross weight above 12,500 pounds.

**Tier II Unmanned Aircraft.** A powered unmanned aircraft; that has a gross weight of 500 pounds to 12,500 pounds.

**Tier III Unmanned Aircraft.** A powered unmanned aircraft that has a gross weight of 250 to 500 pounds.

**Tier IV Unmanned Aircraft.** A powered unmanned aircraft that has a gross weight of 50 to 250 pounds.

**Tier V Unmanned Aircraft.** A powered unmanned aircraft that has a gross weight of .1 pound to 50 pounds.

**Unmanned Aircraft (UA).** A device that is used or intended to be used for flight in the air that has no onboard pilot. This includes all classes of airplanes, helicopters, airships, and translational lift aircraft that have no onboard pilot. A UA is an aircraft as defined in 14 CFR 1.1.

**Unmanned Aircraft System (UAS).** For the Department of Energy, a UAS is a powered unmanned aircraft, launching device (if any), ground and flight control systems; that is not used for sport or hobby, but for commercial or public purposes to conduct aerial research, aerial photography, aerial survey, or research and development of platforms, sensors, cameras, or other such devices that are operated in the National Airspace System or within DOE or NNSA Restricted Airspace.

**Using Agency.** Means the agency, organization, or military command whose activity within a restricted area necessitated the area being so designated.



Unscheduled maintenance. Maintenance that is incurred because of the condition or premature failure of a part, component, and appliance associated with the airframe, engine, fuel system, flight control system, or avionic equipment. The failure can be precipitated by accumulated flight hours, cycles, calendar time or by an initial or one time airworthiness directive or manufacturer's mandatory service bulletin.

Visual Control. In regards to UAS activities, means flight within 1 nautical mile laterally and within 3000 feet vertically of the pilot or an observer to maintain visual line of sight with the aircraft to control the UA or observe the UA for collision avoidance.

Visual-Line-of-Sight. Method of control and collision avoidance that refers to the pilot or observer directly viewing the UA with human eyesight. Aids to vision such as binoculars, field glasses, or telephoto television may be employed as long as their field of view does not adversely affect the surveillance task.



## Appendix A Sample GC Letter

MEMORANDUM FOR: ERIC J. FYGI  
DEPUTY GENERAL COUNSEL  
OFFICE OF GENERAL COUNSEL

THROUGH: ROBERT G. JENKINS  
DIRECTOR AND SENIOR AVIATION  
OFFICIAL  
OFFICE OF AVIATION MANAGEMENT

FROM: <INSERT NAME OF TRAVEL APPROVING AUTHORITY>  
<INSERT TITLE >  
<INSERT ORGANIZATION>

SUBJECT: Request for Official Travel on Government Aircraft, <insert name of principal traveler and inclusive travel date(s)>

MEMO SAMPLE 1:  
Use when the principal traveler is a Senior Federal Official assigned to DOE Headquarters (HQ). Travel will be coordinated through the HQ Office of Aviation Management.

The individuals listed below are scheduled to use a <insert appropriate type Government-owned/chartered aircraft (e.g. DOE Lear 35)> for official travel. Travel will be from <insert origin> to <insert destination> on <insert travel date(s)> to <insert detailed purpose, reason or explanation for travel (e.g. program-orientation flight)>.

<Insert name, title or rank, and office for all travelers>

As travel-approving authority, I have determined <insert appropriate justification (i.e. other modes of transportation, including scheduled airline flights, will not meet the traveler s schedule, and/or are less cost-effective)>. Therefore, in accordance with OMB Circular A-126, paragraph 11, DOE Order 440.2B, and the attached cost analysis, I authorize payment of approximately \$<insert cost> to <insert aviation service provider> for use of their <insert type Government-owned/chartered aircraft> for this travel. Please contact <insert name and phone number> for further information.

**RECOMMENDATION:** Senior Aviation Official and General Counsel sign memo to approve travel on Government aircraft for this event.

Attachments: Cost Analysis  
Itinerary

cc: <insert applicable organizations as required>



**Sample GC Approval Memo**

**APPENDIX B**

MEMORANDUM FOR: ERIC J. FYGI  
DEPUTY GENERAL COUNSEL  
OFFICE OF GENERAL COUNSEL

THROUGH: ROBERT G. JENKINS  
DIRECTOR AND SENIOR AVIATION  
OFFICIAL  
OFFICE OF AVIATION MANAGEMENT

THROUGH: <INSERT NAME OF LOCAL AVIATION MANAGER>  
<INSERT TITLE>  
<INSERT OFFICE>

FROM: <INSERT NAME OF TRAVEL APPROVING AUTHORITY>  
<INSERT TITLE>  
<INSERT OFFICE>

SUBJECT: Request for Official Travel on Government Aircraft, <insert name of principal traveler and inclusive travel date(s)>

**MEMO SAMPLE 2:**  
Use when the principal traveler is a Senior Federal Official or Non-Federal Traveler, not assigned to a DOE Headquarters (HQ) office. Travel is coordinated through both the Local and HQ Offices of Aviation

The individuals listed below are scheduled to use a <insert appropriate type Government-owned/chartered aircraft (e.g. DOE Lear 35)> for official travel. Travel will be from <insert origin> to <insert destination> on <insert travel date(s)> to <insert detailed purpose, reason or explanation for travel (e.g. program-orientation flight)>.

<Insert name, title or rank, and office for all travelers>

As travel-approving authority, I have determined <insert appropriate justification (i.e. other modes of transportation, including scheduled commercial flights, will not meet the traveler s schedule, and/or are less cost-effective)>. Therefore, in accordance with OMB Circular A-126, paragraph 11, DOE Order 440.2B, and the attached cost analysis, I authorize payment of approximately \$<insert cost> to <insert aviation service provider> for use of their <insert type Government-owned/chartered aircraft> for this travel. Please contact <insert name and phone number> for further information.

**RECOMMENDATION:** Senior Aviation Official, Local Aviation Manager, and General Counsel sign memo to approve travel on Government aircraft for this event.

Attachments: Cost Analysis  
Itinerary

cc: <insert applicable organizations as required>