U.S. Department of Energy
Washington, D.C.

ORDER

DOE O 440.2B

Issued: 11-27-02

This directive was reviewed and certified as current and necessary by Bruce M. Carnes, Director, Office of Management, Budget and Evaluation/Chief Financial Officer, 11-27-02.

SUBJECT: AVIATION MANAGEMENT AND SAFETY

1. OBJECTIVE. To establish the framework for an efficient, effective, secure, and safe aviation program in the Department of Energy (DOE) and its contractor aviation operations. Except for certain airspace rules that apply to all aircraft, [reference FAA Act of 1958, Title 49 United States Code (U.S.C.), Subtitle VII] the Federal Aviation Administration (FAA) has no legal jurisdiction over "public aircraft" operations. Therefore, for federally owned or operated aircraft DOE must be self-regulating [refer to 49 U.S.C. 410125(a)37]. However, when a federally owned aircraft is carrying personnel not essential to the performance of a governmental function, for which the aircraft was dispatched or when an aircraft operation is conducted for compensation from outside of the Federal Treasury, then for that operation, the aircraft is considered a "civil" aircraft and is required to comply with the applicable sections of the Federal Aviation Regulations, Title 14 Code of Federal Regulations (CFR) Chapter 1, Parts 21, 43, 61, 65, 91, 119 and DOE policy.

2. CANCELLATION. DOE O 440.2A, *Aviation*, dated 3-8-02. Cancellation of an Order does not, by itself, modify or otherwise affect any contractual obligation to comply with such an Order. Canceled Orders incorporated by reference in a contract remain in effect until the contract is modified to delete the reference to the requirements in the canceled Orders.

3. APPLICABILITY.

   a. DOE Elements. This Order applies to all DOE elements, including the National Nuclear Security Administration (NNSA) and the Bonneville Power Administration, involved with the management, operation, and/or maintenance of aircraft and related services and facilities that obtain Commercial Aviation Services (CAS) (see Attachment 2, Definitions), except where indicated in exclusions in paragraph 3c.

   b. Contractors (M&O, M&I, ERMC, and other designated contractors). Except for exclusions in paragraph 3c, the Contractor Requirements Document (CRD), Attachment 1, sets forth requirements to be applied to major facilities management contracts (M&O, M&I, ERMC, and other designated contractors). The CRD applies to the extent set forth in the contract.

      (1) The CRD is included in major facilities contracts through the procedure described in the law, regulations, and directives contract clause found in the Department of Energy Acquisition Regulation.

(2) This CRD must be included in major facilities contracts that apply to contractors responsible for managing, operating, and/or maintaining DOE Federal aircraft or major facilities management contracts that obtain CAS to support programmatic needs. The DOE Federal program or field element official responsible for aviation program oversight or management will notify the contracting officer, if not the same, which facility's management contracts are affected. The contracting officer will ensure the CRD is incorporated into all current and future contracts associated with facilities that operate and maintain Federal aircraft or facilities that obtain CAS.

(3) Regardless of the performer of the work, the contractor is responsible for compliance with the requirements of the CRD after it is incorporated into the contract. The contractor is responsible for flowing down the requirements of the CRD to subcontracts at any tier to the extent necessary to ensure the contractor's compliance with the requirements.

c. Exclusions. The management and safety requirements in paragraph 4 of this Order do not apply to—

(1) aircraft owned by the Armed Forces or operated on behalf of the U.S. Government by Armed Forces personnel as defined by United States Code (U.S.C.) Title 10;

(2) aircraft owned and operated by the National Guard;

(3) aircraft owned and operated by other governmental agencies when used by DOE programs during emergency events where loss of life or property is imminent, if the manager in charge approves the operation and certifies that this is the only reasonable option;

(4) aircraft owned and operated by another governmental agency in a nonemergency if—

(a) the requirements for applying the Federal Flight Safety Standards Guidelines are established in a governing document (e.g., a memorandum of agreement or memorandum of understanding) and

(b) the governmental agency meets the standards established by the field element; and

(c) the aviation program manager of the using organization approves the operation; and

(5) scheduled airline operations conducted by U.S. air carriers.

4. REQUIREMENTS.

a. Aviation Implementation Plans. Each DOE field element and independent operating entity that has responsibility for assigned Federal aircraft (see Attachment 2, Definitions) or uses commercial aviation services (CAS; see Attachment 2, Definitions) must develop and publish an aviation implementation plan (AIP; see Attachment 2, Definitions) 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.

(1) The AIP must be submitted to the Director of the Office of Aviation Management (OAM). The OAM Director must review and approve the AIPs submitted by DOE elements that are not part of the NNSA. The OAM Director will review and make recommendations for or against approval to the Administrator for Nuclear Security on the AIPs submitted by NNSA elements. If a difference of opinion develops between the OAM Director and the NNSA Administrator regarding whether an AIP should be approved they will bring the issue to the Secretary or Deputy Secretary for resolution or direction.

(2) Significant changes in management, operations, or maintenance standards require revision and a subsequent approval of the AIP.

(3) Each AIP must be reviewed and updated at least annually.

(4) All affected DOE elements, except as provided in paragraph 3c, must submit an AIP for complying with this Order within 180 days of the issuance of this Order, except as provided in the following paragraphs.

(5) Amendments or changes to a previously approved AIP must be submitted to the OAM Director for a subsequent approval or review within 90 days of the issuance of this Order.

(6) Implementation plans and changes are considered reviewed or approved if the OAM Director has not responded within 90 days of receipt of the AIP document.

b. DOE Elements. DOE elements that use only CAS exclusively for the Federal Government, for the performance of governmental missions or passenger operations, must require the vendor or contractor to comply with the civil standards [Title 14 CFR, Chapter1 and 49 CFR Chapter XII] applicable to the type of operations conducted while in service to the Department or its contractor.

c. Former Military Aircraft. Former military aircraft owned or operated by the Department, other than aircraft operations excluded by paragraph 3c, must have a Federal Aviation Administration- (FAA-) accepted or FAA-approved continued airworthiness maintenance and inspection program [Title 14 CFR, Chapter 1, Part 91.409, paragraph g], applicable to the type and model aircraft operated, before entering service to the Department.

d. DOE Federal Aircraft. Departmental Federal aircraft in service to DOE must be operated and maintained in accordance with the applicable parts of Title 14 CFR Chapter 1, 49 CFR Chapter XII and/or equivalent international standards appropriate for the operations and type of aircraft in service and Departmental policy.

e. Aviation Program Managers and Safety Officers. All Federal personnel assigned as aviation program managers and aviation safety officers must meet the qualifications established in the "Departmental Aviation Program Manager's and Aviation Safety Officer's Technical Qualification Standards" and the qualifications established by the assigned position descriptions for those positions within 18 months of their assignment. The qualifications must be commensurate with assigned duties.

f. Passenger Manifests. DOE elements will maintain passenger manifests. A copy of the manifest will be kept at the office of the responsible authority for 2 fiscal years following the year during which the flight occurred. As a minimum, the manifest will consist of the full name of each passenger 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.

g. Weight and Balance Limits. DOE elements must ensure that aviation operations perform weight and balance calculations to ensure that aircraft are within the 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.

h. Flight Program Standards. Field element managers of DOE aviation programs that operate Federal aircraft (see Attachment 2, Definitions) must establish comprehensive flight program standards based on paragraph 4d, and ensure that requirements, processes, and/or procedures are established for management/administrative, operations, maintenance/inspection, security and training functions as described below.

(1) Management/Administration.

(a) Field element managers must establish—

1 a management structure, appropriate in size and scope, that is responsible for the administration, operation, safety, training,

maintenance, security and financial needs of Federal aircraft operations;

2 roles, responsibilities, and authorities of assigned managers, pilots, maintenance personnel, flight crew members, flight safety personnel, and dispatchers, as applicable;

3 procedures to track and record flight crew member duty time, flight time, and training;

4 procedures to track and record maintenance personnel duty time and training; and

5 cost accounting systems that record the costs of operations and maintenance, including—

a cost elements defined within the General Services Administration's (GSA's) Cost Accounting Guide;

b costs that support Office of Management and Budget (OMB) Circular A-76, Supplement, Annex 6;

c costs required by Federal Property Management Regulations or successor regulations promulgated by GSA; and

d costs associated with the type of aircraft operation, benefitting activity, and mission for each flight.

(b) Aviation management personnel must—

1 have qualifications commensurate with their duties, responsibilities, and authorities;

2 have experience similar to the civil requirements established for management personnel conducting similar flight operations; and/or

3 meet the qualifications and training requirements defined in paragraph 4e.

(2) Operations.

(a) Field element managers must establish—

1 basic qualifications and currency requirements for the pilots, crew members, maintenance personnel, and other mission-related personnel, as required by the organization's approved AIP;

2 duty and flight time limits appropriate to the type of operation being conducted, (e.g., limits on the time an employee is on call, standby, or ready reserve);

3 methods or processes for proving compliance with DOE and or manufacturer safety-of-flight notices and operational bulletins;

4 procedures to provide for timely notification of management and initiation of search and rescue operations in case of a lost or downed aircraft;

5 passenger safety briefings that fulfill the requirements set forth in 14 CFR Part 135.117 or 121.571, and those established in the 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);

6 appropriate emergency procedures and equipment, including personnel and aircraft evacuation procedures;

7 a program for ensuring aviation life support equipment, if required for a specific mission, is inspected and serviceable;

8 written policies and procedures for the type of aircraft operations conducted; and

9 an operations management tracking and review process (using existing data systems where possible) that provides managers key performance indicators on a regular basis. Examples are number of flights and flight hours by pilot per month, air crew member training status per crew member per month, pilot proficiency (events) per pilot per month, operational effectiveness, aircraft and crew scheduling effectiveness, cost effectiveness, etc.

(b) It is the Department's policy that supplemental (part-time) pilots (see Attachment 2, Definitions) must not be used as an alternative to full-time pilots. However, it is recognized that there are certain limited instances where a supplemental pilot may provide a cost-effective supplemental capacity to meet specific unfulfilled flight crew member requirements. The qualifications and processes for using supplemental pilots must be

incorporated into the field element's AIP and the contractor's, if applicable, aviation procedures or operations manual. The use of a supplemental pilot is prohibited unless the pilot meets the following criteria:

1 holds an appropriate pilot rating for the operation being conducted and a type rating, if required;

2 has a valid FAA Class II or Class I medical certificate, as prescribed by Title 14 CFR, Chapter 1;

3 for instrument ratings:

a airplane pilots must hold a current airplane instrument rating; and

b helicopter pilots must hold a current helicopter instrument rating, if the operation requires flight under instrument conditions;

4 has a minimum 1500 hours as a pilot-in-command in the category and class of aircraft to be flown;

5 has a minimum 500 hours as pilot-in-command in the make and model aircraft to be flown;

6 logs at least 15 hours as a pilot in the make and model of aircraft to be flown during the 45 days preceding initial assignment as a flight crew member and, thereafter, maintain pilot proficiency and qualifications in accordance with the field element's requirements, if the pilot is used on a recurring basis;

7 completes an initial training course, conducted by the field organization, that includes orientation flights in the type of mission to be flown, and addresses crew resource management and any identified hazards associated with the area or type of operation;

8 passes an initial check ride given by the individual in the field organization designated as the chief pilot or check airman, before any flight operations;

9 has a minimal impact on the ability of the full-time flight crew members to maintain proficiency; and

10 is limited to assignment as second-in-command pilot duties only.

(c) The Director, OAM, may approve contract or subcontract supplemental pilots to act as pilots-in-command of Federal aircraft, other than those in the NNSA, on an individual basis. The Administrator of Nuclear Security may approve contract or subcontract supplemental pilots to act as pilots-in-command of NNSA aircraft on an individual basis after he has received a recommendation from the Director, OAM.

(d) An organization may use the field element's designated aviation manager or aviation safety officer, but not both, as an incidental pilot (see Attachment 2, Definitions), on a closely controlled and limited basis, to supplement or assess flight operations. The qualifications and processes for using these staff members must be included in the field element's AIP and, if applicable, the contractor's aviation procedures or operations manual. The use of the aviation manager or safety officer is prohibited unless the pilot meets the following criteria:

1 holds an appropriate pilot rating for the operation being conducted and a type rating, if required;

2 has a valid FAA Class II or Class I medical certificate, as prescribed by Title 14 CFR, Chapter 1;

3 for instrument ratings:

a airplane pilots must hold a current airplane instrument rating; and

b helicopter pilots must hold a helicopter instrument rating, if the operation requires flight under instrument conditions;

4 has a minimum 1200 hours as a pilot in the category and class of aircraft to be flown;

5 has a minimum 500 hours as pilot-in-command in the category and class of aircraft to be flown;

6 logs at least 15 hours as a pilot in the make and model of aircraft to be flown during the 45 days preceding assignment as a flight crew member or complete a formal initial qualification training course in the make and model of aircraft to be flown;

7 completes a training course, conducted by the organization, that includes orientation flights in the type of mission to be flown that addresses crew resource management and any identified hazards

associated with the area or type of operation and the flight mission profile to be performed;

8 passes an initial check ride given by the field organization before any flight operations;

9 maintains pilot proficiency and qualifications in accordance with the field element's requirements;

10 has a minimal impact on the ability of the full-time flight crew members to maintain proficiency; and

11 is limited to a flight crew member assignment commensurate with the pilot's qualifications and currency; and as approved by the Director, OAM.

(3) Maintenance/Inspection Programs.

(a) Field element managers must establish—

1 aircraft maintenance and inspection programs to ensure the safety of flights in accordance with either applicable manufacturers' programs, FAA-approved inspection programs, or continuous maintenance programs established under 14 CFR 91, 121 or 135;

2 processes or procedures to obtain applicable technical support, including appropriate engineering documentation and testing, for aircraft, powerplant, propeller, or appliance repairs, modifications, or equipment installations;

3 quality control processes for the purchase and acquisition of replacement parts, ensuring that parts purchased or acquired have the necessary documentation to determine airworthiness and traceability;

4 procedures to record and track maintenance actions; inspections; flight hours, cycles, and calendar times of retirement life components, parts and for Flight Safety Critical Aircraft Parts (i.e., Department of Defense surplus/excess);

5 policies and procedures on returning aircraft to service after maintenance and inspection;

6 requirements, processes, and procedures for the operation of aircraft with inoperable equipment; and

7 procedures or processes to ensure the integrity and quality control of maintenance actions by ensuring that maintenance performed by one qualified individual on a critical area of an aircraft is checked and documented by another qualified individual who did not perform the work. Critical areas must include as a minimum the following:

a removal or installation of a component or part of a flight control;

b removal or installation of any component or part of a main drive or tail rotor drive system;

c removal or installation of a component or part of a main or tail rotor hub assembly;

d removal, disassembly, reassembly or installation of a power turbine, compressor, gearbox, combustion section or a removal and installation of a complete powerplant assembly;

e removal or installation of a fuel control or governor of a powerplant;

f removal or installation of a propeller governor or reduction gearbox;

g removal or installation of a component or part of a fuel system;

h removal or installation of a propeller assembly or blade;

i removal or installation of any component or part associated with the landing gear of a fixed-wing aircraft;

j removal or installation of internal or external mission equipment by technicians or scientists not rated under Title 14 CFR, Chapter 1, Part 65; and

k procedures for maintenance of any of the identified critical systems when an aircraft is away from home base.

(b) Field element managers must comply with the Department's safety-of-flight notices, FAA airworthiness directives, and or mandatory manufacturers' bulletins applicable to the types of aircraft, engine(s), propeller(s), and appliances in their aircraft operations.

(c) Field element managers must implement a maintenance management tracking and review process (using existing data systems where possible) that provides managers information on key elements of performance (i.e., performance indicators) on a recurring and systematic basis. Examples include maintenance effectiveness, scheduling effectiveness; parts and supply logistics effectiveness; cost effectiveness; and reliability rates of aircraft, powerplants, propellers, and systems.

(d) Each field element must report to the FAA within 72 hours after a field element discovers any serious defect in, or other recurring unairworthy condition of, an aircraft, powerplant, or propeller, or any component of any of them. The field element must file the report using the Web-based, Internet-accessible FAA Service Difficulty Reporting System or the FAA accepted Helicopter Association International's Maintenance Malfunction Information Report System. The report must describe the defect or malfunction completely without withholding any pertinent information. If the defect or malfunction could result in an imminent hazard to flight, the field element must use the most expeditious method it can to inform the FAA and the OAM.

(4) Training.

(a) Flight crew members and maintenance personnel must complete initial training and recurrent training appropriate for their responsibilities and relevant to the types of aircraft and operations/missions conducted by the Department. The training must—

1 be events based;

2 measure performance;

3 meet FAA standards and minimum standards established by the field element;

4 include measures taken to correct identified deficiencies;

5 be tracked per pilot and mechanic;

6 be tracked per aircraft type, make, and model; and

7 be documented to provide for outside oversight and appraisal.

(b) Flight crewmembers and maintenance personnel must demonstrate proficiency in operational and maintenance tasks relevant to the types of aircraft and operations/missions conducted by the Department. The field element manager must establish the tasks or skills to be measured and proficiency goals for each.

(c) Flight dispatchers and cabin safety personnel must complete initial training and recurrent training appropriate for their responsibilities and relevant to the types of aircraft and operations/missions conducted by the Department.

i. Safety Programs. Field element managers of DOE aviation programs that operate Federal aircraft (see Attachment 2, Definitions) must establish comprehensive, integrated aviation safety programs. Field element managers must—

(1) define the work (e.g., the type(s) of aircraft operations to be conducted, missions, area(s) of operations);

(2) establish risk analysis and risk management procedures to identify hazards, including associated potential event initiated accidents and implement safety administrative and/or engineering controls to prevent or mitigate postulated hazards related accidents in order to mitigate hazards and manage risk to an acceptable level;

(3) conduct work along with associated required operations within established controls;

(4) conduct independent, internal assessments and oversight to verify that the standard elements required by this Order are implemented;

(5) establish a system for providing internal feedback on safety issues; communicating and reporting hazards, incidents, and accidents; and disseminating safety/accident prevention and related information;

(6) participate in the GSA's Aircraft Accident Incident Reporting System and any other accident or incident reporting systems prescribed by DOE policy;

(7) participate in the Department's Aviation Management and Safety Awards Program; and

(8) develop an accident response plan that includes—

(a) procedures for notifying NTSB and DOE of accidents and incidents defined by 49 CFR 830, "Notification and reporting of aircraft accidents or incidents and overdue aircraft, and preservation of aircraft wreckage, mail,

cargo, and records"; DOE O 225.1A, *Accident Investigation;* and DOE O 232.1A, *Occurrence Reporting and Processing of Operations Information,* and

(b) procedures that address DOE responsibilities established in the *Federal Plan for Aviation Accidents Involving Aircraft Operated by or Chartered by Federal Agencies,* NTSB Report Number SPC-99-04.

j. Remotely Operated Aircraft (ROA) Standards for Operations and Airworthiness. DOE elements conducting ROA operations (see Attachment 2, Definitions) outside the scope of Title 14 CFR, Chapter 1, must establish policies and procedures to ensure the safety, airworthiness, and effectiveness of their aviation operations. The OAM Director must review and concur with the policies and procedures submitted by DOE elements that are not part of the NNSA. The OAM Director will review and make recommendations for or against approval to the Administrator for Nuclear Security on ROA policies and procedures submitted by NNSA elements. If a difference of opinion develops between the Director, OAM, and the NNSA Administrator regarding whether a ROA policy or procedure should be approved they will bring the issue to the Secretary or Deputy Secretary for resolution or direction.

(1) Fail-safe Principles. Fail-safe principles will govern the design of ROA flight critical systems. The flight critical systems must be independent and/or adequately redundant with back-up features that will provide for safe functioning of the ROA in the event of flight critical system failure.

(2) Failure Detection. Any system design must provide a failure detection apparatus (preflight and in-flight built-in-test) that will notify the ROA operator of a flight critical system failure.

(3) Flight Control and Navigation Software Verification and Validation. All ROA flight control and navigation system software verification and validation activities must be performed in accordance with Radio Technical Commission for Aeronautics (RTCA) Design Objective 178B or current RTCA or other FAA standards.

(4) Flight Control System. The flight control system must include the ROA operator controls, sensors, computers, and actuation parts necessary to control the ROA flight trajectory throughout the entire mission profile and ensure the following:

(a) adequate stability throughout the expected flight envelope;

(b) any single failure of the flight control system will not significantly affect the operator's ability to control ROA recovery;

(c) provisions for possible revision to degraded modes of operation are incorporated into flight control system design; and

(d) the ROA will remain controllable in the event of propulsion system failure.

(5) Electrical System. The electrical system must provide sufficient power and endurance to ensure safe operations and recovery throughout all phases of flight. In the event of an emergency, the electrical system or emergency power supply should be of sufficient capacity to enable recovery at either the intended or a predetermined/alternate recovery area.

(6) Communications System/Data Link(s). Approval for all frequencies used in ROA operations must be obtained from the Federal Communications Commission. In addition, the following must be met:

(a) The maximum range of the communication link must be determined and sustained by the ROA operator.

(b) Any single failure of the communications system (uplink or downlink) must not affect normal control of the ROA.

(c) Uplinks/downlinks are sensitive to electromagnetic interference and must be adequately protected from this hazard.

(d) Aircraft designs must incorporate provisions for recovery of the ROA in the event of temporary or total loss of the communication system.

(7) Navigation System. The aircraft navigation system must meet the required navigation performance standards for the airspace classification in which the operations are to be conducted (see Attachment 3, Table 2). Navigation system designs must also consider the complexity and level of air traffic operations found in the airspace in which the ROA will operate. Operation of ROAs in the National Airspace System (NAS) must have FAA approval (see Attachment 3), except within the boundaries of the NAS classified as restricted airspace or warning areas.

(8) Propulsion System. All essential elements of the propulsion system, including the engine, engine controls, propeller, propeller components, actuators, and essential sensors, must meet documented reliability standards established by industry or U.S. specifications or comply with Attachment 3.

(9) Aircraft Control Station. Manned aircraft cockpit features (e.g., control placement and ease of control column forces) do not have to be duplicated exactly.

(a) Station design must facilitate control of the ROA by the internal pilot and provide for unambiguous operations and clear indications of ROA flight status.

(b) Design criteria must minimize the potential for human error. All "conventional" flight indications and warnings necessary to ensure safe control of the ROA flight path must be provided. In particular, the ROA pilot must be informed of any degraded mode of operations due to any failure, including cases in which there is an automatic switching to an alternate or degraded mode of operation.

(c) The control station must include a diagnostic and monitoring capability for the status of the ROA. Real-time, direct communication/surveillance and/or latent data transmission capability must be provided in the absence of failure.

(d) For operations in controlled airspace, direct communication with the FAA controlling agency should be incorporated into the ROA control station system design.

(e) If more than one ROA operation is occurring at the same time and the ROAs are being controlled from the same terminal: conduct an evaluation of the tasks required by the operator/pilot; determine if adequate controls and monitors exist; and that operator workload is such that control can be maintained to operate the simultaneous ROA operations. Considerations should be given to whether one or more of the ROAs are under autonomous control or manual control by the operator pilot.

(f) If an external operator pilot, (other than the operator in the control station) is used during the takeoff and landing phases of the flight receives flight parameter information from the aircraft control station through an intercommunication system, the intercommunication system between the operator and the control station must be as reliable as conventional aircraft communication systems.

(10) Flight Termination System. The ROA operator must have a means of safely terminating flight of the aircraft in all phases of flight operations. The flight termination system must avoid the use of explosives to the maximum extent possible.

(11) Airworthiness. A statement indicating compliance with the listed or otherwise identified sections of Attachment 3 or compliance with14 CFR Part 21.17 (b), will be submitted by the ROA operator or manufacturer.

(a) An operator or manufacturer may substitute alternate data in place of the data listed in Attachment 3. The data must specifically address the substituted paragraph(s) and note the substitution in the compliance statement. The alternate data must also provide a level of safety at least equivalent to the level of safety specified in Attachment 3, Table 1. All alternate data must be documented and a DOE Flight Readiness Review Board will make the final determination regarding the justification and merit of the proposed alternate data.

(b) FAA Advisory Circulars 43.13-1B and 43.13-2A, Change 2, must be used by repairmen or technicians in the fabrication, installation, and repair of the airframe and components.

k. Safety Documentation. DOE elements must prepare aviation safety documentation for each mission that has risks not normally accepted by the public. Risks not normally accepted by the public, is defined as an aircraft operation (Other than aerial transportation of personnel and cargo, aerial patrols, aerial photography, aerial survey, rotorcraft external load operations, and aerial application) that is not regulated or cannot comply with the applicable parts of 14 CFR Chapter 1, the Federal Aviation Regulations or 49 CFR Subchapter C.

l. Charter and Lease Operations. DOE elements involved in CAS operations must ensure that aircraft charter and lease contractors are evaluated by the appropriate DOE organization or designee before the initiation of flight operations and, if a continuing need exists, evaluations must be conducted every 24 months thereafter.

m. Use of Company and Private Aircraft. The use of company and private aircraft by Senior Federal Officials and political appointees must be coordinated through the Office of Aviation Management for DOE General Counsel's approval.

n. Reporting Requirements. The following reporting requirements are established to ensure Federal aircraft and CAS are effectively used, program needs are met, and accurate information is obtained to report accountability to appropriate oversight entities. In addition, the information provided by paragraphs 4n(2) and 4n(3) will be used by OAM to improve coordination and scheduling of programmatic research and development needs with available aviation assets.

(1) Each field element operating, using, or sponsoring the use of Government aircraft must appoint a responsible individual to maintain the required records and reports of aircraft use and the other required reports established by this Order. The name of the responsible individual must be provided to OAM.

(2) Program and DOE Field elements involved with research and development work requiring the use of an aircraft or ROA must file the mission profile on the Departmental Aircraft Coordination Database or with OAM before operations. The report should include the following information:

(a) estimated payload requirements;

(b) anticipated or desired altitudes of operations;

(c) areas of operations;

(d) any limitations as far as air or ground speeds during the test;

(e) desired endurance (time aloft); and

(f) anticipated dates or planned dates of deployments.

At a minimum, items noted in paragraphs 4n(2) (a), (c) and (f) must be transmitted to/on the Departmental Aircraft Coordination Database or OAM as soon as the program office sponsoring the aircraft operation(s) becomes aware of the need for aircraft.

(3) Field elements that operate Federal aircraft involved with research and development work, including a ROA, must provide the following information to the Director, OAM, or the Departmental Aircraft Coordination Database on a quarterly basis:

(a) aircraft type(s);

(b) aircraft make(s) and model(s);

(c) date(s) aircraft is/are available;

(d) number of days aircraft is/are available; and

(e) any limitations, such as number of flight hours aircraft can be used, altitude restrictions, airspeed restrictions, or payload restrictions.

(4) Every use of Government aircraft requires quarterly reporting of flight hours, costs, and other relevant information to the Federal Aviation Interactive Reporting System as required by the Federal Property Management Regulations or successor regulations promulgated by GSA. Accepted vendors must be reported to OAM or the DOE Aircraft Charter Database as soon as possible.

(5) Each field element shall report the travel of Senior Federal Officials (see Attachment 2, Definitions), on-board Federal or CAS aircraft semi-annually to the OAM. This information is required for consolidation and reporting to GSA and OMB in the Senior Federal Travel report. The report will include the following information:

(a) Agency/Organization;

(b) Name of the traveler;

(c) Number of flights; and

(d) Traveler status, e.g. Senior Federal Official, Senior Executive Branch employee, Non-Federal employee, etc.

o. Use of Government Aircraft for Official Travel.

(1) DOE will primarily use scheduled commercial airlines for official travel and transportation of persons. Exceptions to this policy may be made when—

(a) such regularly scheduled commercial airlines are unable to meet scheduling requirements;

(b) the cost of CAS provider or Federal aircraft services is less than the cost of scheduled commercial airlines (the cost of the commercial airfare to be used for the comparison is the Government rate or the lowest fare available, if there is no government rate available for the date of travel, quoted to the traveler on the date the traveler learned about the trip);

(c) the mission requirements (see Attachment 2, Definitions) necessitate the use of Government aircraft (see Attachment 2, Definitions); or

(d) the safety of scheduled commercial airlines (or other modes of travel) in foreign countries cannot be verified or is found to be unacceptable.

(2) Traveler safety is the paramount consideration and will not be compromised for convenience or cost factors. All use of a Government aircraft must be in compliance with the Federal Travel Regulations and applicable policies from OMB.

(3) General Policy and Procedures for Procuring Accepted Government Aircraft for Passenger Transportation that is not mission requirements travel.

(a) Travel aboard Government aircraft requires a determination by the travel approving official that such travel is necessary and that funds are available. Before approving the use of Government aircraft, the approving official must consider the availability and relative cost of Federal and charter aircraft services compared with the cost of scheduled commercial airline services.

(b) No person may be carried aboard a Government aircraft without a proper travel authorization.

(c) Field elements must maintain passenger manifests for flights, as required by paragraph 4f.

(d) Aircraft owned by another agency and CAS, other than United States scheduled commercial carriers, may provide passenger service to the Department only after verification of safety and procedures standards by DOE aviation personnel, except Armed Forces aircraft used for reimbursable travel. Accepted providers will be listed in the DOE Aircraft Charter Database and the information made available to all interested persons.

(e) Government aircraft must not be procured, dispatched, or used for personal convenience, political travel purposes, or unofficial travel. Incidental travel for political events may be authorized only by the DOE Headquarters Office of the General Counsel.

(f) Except for mission requirements travel (see Attachment 2, Definitions), no Senior Federal Official or non-Executive branch employee may travel aboard a Government aircraft without the prior written approval of the General Counsel or his or her principal deputy. All required use travel, regardless of the traveler, must be approved in advance and in writing by the General Counsel or his or her principal deputy. Except for mission requirements travel and required use travel, all Executive branch employees who are not Senior Federal Officials may travel aboard a Government aircraft with the prior written approval of the field element's Chief Counsel. The authority to approve such travel cannot be delegated. Records will be retained for 2 fiscal years following the year of the flight.

(g) Except for mission requirements travel, Government aircraft may only be used for required use travel or if the Government aircraft is more cost effective than the lowest available commercial airfare on the date that the traveler learned of the proposed travel.

p. Accepted Aircraft Operators.

(1) Each field element must procure CAS in accordance with its approved procurement procedures and AIP.

(2) Before using a Government aircraft (Except DOE Federal aircraft), the aircraft and aircraft operator must be accepted. Accepted aircraft and operators are those that have been evaluated by the Department and found to meet DOE aviation safety and operational standards.

(3) Departmental Federal aircraft may be approved for official travel, including mission requirements travel. These aircraft will be listed in the "Aircraft Charter Database." Field elements operating Federal aircraft that regularly transport passengers must receive information from OAM before the program budget year for planning Headquarters support flight time. Each field element must budget for the appropriate level of activity.

(4) The Department occasionally relies on the aircraft support of other Federal, State, and local government agencies. Verification of the operator's compliance with government aviation safety standards, except for the exclusion in paragraph 3(c)(3), is required before personnel can travel or conduct missions on other Government aircraft, including the use of foreign government aircraft.

(5) Accepting Commercial Operators:

(a) CAS providers must be evaluated by appropriate DOE aviation authorities before being used. Accepted CAS providers are listed in a database maintained by OAM titled "Aircraft Charter Database."

(b) If an organization wishes to use a CAS provider that is not listed in the "Aircraft Charter Database" it must contact OAM for assistance in gaining approval for use of the operator.

q. Common Procedures That Apply to Official Travel.

(1) Each traveler and the travel approving authority must consider the most cost-effective means of travel commensurate with accomplishment of the official travel (see Attachment 2, Definitions).

(2) Cost effectiveness will be determined by the total cost to taxpayers of each available mode of travel, including the cost of the transportation (the cost of the commercial airfare to be used for the comparison is the Government rate or the lowest fare available, if there is no government rate available, for the date of travel, quoted to the traveler on the date the traveler learned about the trip) and

related factors such as the per diem and the employee's lost work time with each option.

(3) The travel approving authority will retain documentation of the cost analysis for 2 fiscal years following the year of travel.

r. Special Procedures That Apply to Official Travel other than Mission Requirements Travel.

(1) Except for mission requirements travel, all travel by Senior Federal Officials or non Executive branch employees aboard Government aircraft requires approval by the appropriate travel approving official and by the General Counsel or his/her principal deputy. All required use travel regardless of the identity of the traveler requires the approval by the appropriate travel approving official and the General Counsel or his or her principal deputy. Such approvals must be in advance and in writing. In an emergency situation, an after-the-fact written determination is permitted, but a verbal approval must be obtained prior to the travel. Travel aboard Government aircraft for purposes of attending meetings, site visits, or conferences or making speeches are examples of travel that are subject to this approval process. The Office of the General Counsel must maintain records of such approvals for 2 fiscal years following the year of the flight.

(2) Except for mission requirements travel, all travel that is not required use travel by all Executive branch employees, who are not senior Federal officials, aboard Government aircraft requires approval by the appropriate travel approving official and by the chief counsel of the field office. Such approval must be in advance and in writing. In an emergency situation, an after-the-fact written determination is permitted, but a verbal approval must be obtained prior to the travel. Travel aboard Government aircraft that is more cost effective than flying on commercial aircraft is subject to this approval process. The Office of the Chief Counsel must maintain records of such approvals for 2 fiscal years following the year of the flight.

(3) Each field element must report travel of senior Federal officials (see Attachment 2, Definitions) on-board Government aircraft semi-annually to the OAM.

(4) The office supporting the travel will submit passenger manifests for approval of travel. Requests for passenger approval must include the full name, title, and organization of each individual scheduled to be on the aircraft, supporting documentation, and a travel determination ready for the signature of the appropriate official. This documentation must be submitted at least ten working days, when practical, prior to the trip to the Office of the Assistant General

Counsel for General Law for travel involving senior Federal officials or non-Executive branch employees and local chief counsel for all other employees.

(5) Failure to timely submit the request and information required by paragraph r. (4) may be grounds to disapprove the travel.

(6) The Office of the General Counsel or Chief Counsel will—

(a) coordinate with the appropriate offices to verify that travel meets the standards for travel;

(b) forward approval for travel to the servicing DOE aviation office and the requesting office or, if warranted, provide reasons for disapproval;

(c) determine whether reimbursement is due to the Government for any travel or portion of the travel. When reimbursement is required, the Office of the General Counsel will coordinate with OAM to calculate the amount of reimbursement and notify the responsible persons to collect the reimbursement; and

(d) retain copies of approvals/disapprovals for 2 years for future travel audits.

s. Foreign Air Carriers.

(1) The use of foreign aircraft, whether Government, scheduled airline, or CAS provider, presents special problems for DOE travelers. Foreign operators may not meet the high standards of safety and oversight required of operators in the United States. While most nations, including the United States, subscribe to the standards of the International Civil Aviation Organization (ICAO), compliance of foreign air carriers is dependent on the ability and expertise of the governments of the nations wherein they reside to provide proper oversight. Monitoring and reporting of a foreign country's ability to properly oversee aviation standards is conducted by FAA. DOE accepts FAA's International Aviation Safety Assessment (IASA) program determination of a foreign government's ability to oversee its flag air carriers as meeting the ICAO standards and therefore acceptable for DOE use. To be fully acceptable under these criteria, the oversight country must be rated as "level 1" by IASA. Individual foreign airlines that demonstrate an unusually high accident history may be deemed unacceptable for passenger travel by OAM even though their host countries meet the oversight criteria.

(2) Foreign CAS providers may not be subject to the same oversight as scheduled commercial carriers in the same country. Military aircraft are not subject to the ICAO standards.

(3) DOE employees planning foreign travel should review the safety standards of the CAS providers they intend to use. Specific assistance for this is available from OAM. If a CAS provider does not meet DOE safety standards, passengers must be informed in writing by the official approving the travel. The travelers must be informed that they are undertaking an uncommon risk by using the substandard carrier.

(4) Foreign CAS providers may be assessed and evaluated by contacting OAM for assistance.

5. RESPONSIBILITIES.

a. Secretary of Energy.

(1) Appoints the Director, OAM, as the Senior Aviation Management Official (SAMO).

(2) Establishes an Aviation Board of Directors, that will be made up of full-time Federal employees.

b. Administrator of Nuclear Security.

(1) Approves AIPs submitted by NNSA elements after receiving a recommendation from the Director, OAM.

(2) Implements effective aviation operations, airworthiness, and safety programs that meet the requirements of this Order.

(3) Identifies the major facilities management contracts to which the CRD applies.

(4) Notifies the contracting office to incorporate the CRD into the affected major facilities management contracts via the Laws, regulations, and DOE directives clauses of the contracts.

(5) Ensures the effectiveness of contractor aviation operations, airworthiness, and safety programs.

c. Director, Office of Aviation Management.

(1) Serves as the DOE SAMO.

(2) Provides recommendations to the Secretary of Energy and the Administrator, NNSA for the safe, efficient, and reliable management of aircraft used by DOE.

(3) Chairs the DOE Aviation Board of Directors.

(4) Nominates candidates for Board membership to the Director, Office of Management, Budget and Evaluation.

(5) Develops and implements policies, systems, and practices to maintain the highest standards of aviation safety, effectiveness, and efficiency, that provide for the highest professional standards of aircraft safety, operations, and airworthiness.

(6) Defines the aviation mission requirements, in collaboration with DOE program offices and field activities.

(7) 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, based on OMB Circular A-76 studies and in collaboration with DOE program offices and field activities. 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 Director, OAM, 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.

(8) Reviews, in collaboration with cognizant DOE offices, the use of aviation assets to ensure the safe and efficient management of the Department's aviation services and resources.

(9) Provides for the final approval for the acquisition and disposal of Departmental aviation assets.

(10) Assists the operating programs with aviation budget preparation, program charter, and contract aircraft activities; conducts appropriate studies and reviews; assures timely and accurate reporting; and implements the highest safety standards and procedures.

(11) Provides technical assistance and guidance, if available, and is the focal point for the collection, retention, evaluation, and dissemination of aviation information.

(12) Represents the Department to other Government agencies concerning aviation operations and reporting.

(13) Approves AIPs for non-NNSA elements of DOE and makes recommendations to the Administrator for Nuclear Security on the AIPs submitted by NNSA elements.
(14) Is the approving authority for any deviations from or waivers to or from the requirements of this order for non-NNSA elements of DOE and makes recommendations regarding any deviations or waivers to the Administrator for Nuclear Security for NNSA elements.

d. DOE Aviation Board of Directors. Recommends broad policy and procedures for the procurement, operations, safety, security and disposal of Federal aircraft and aviation services to the DOE Field Management Council.

e. Office of Independent Oversight and Performance Assurance (OA). Is responsible for conducting independent aviation safety oversight.

f. Heads of Departmental Elements that conduct aviation operations within their programs.

(1) Develop and implement effective aviation operations, airworthiness, security and safety programs that meet the requirements of this Order.

(2) Identify the major facilities management contracts to which the CRD applies.

(3) Notify the contracting office to incorporate the CRD into the affected major facilities management contracts via the laws, regulations, and DOE directives clauses of the contracts.

(4) Ensure the effectiveness of contractor aviation operations, airworthiness, and safety programs.

(5) Appoint an Aviation Program Manager or Aviation Safety Officer or both, depending upon the scope of operations, number of aviation operations conducted or aircraft assigned.

(6) Recommends a person to the Director, Office of Aviation Management for appointment to the Aviation Board of Directors.

g. Office Supporting Travel. When the traveler believes he or she must travel by air on other than a regularly scheduled commercial airline, the office supporting the travel will coordinate the travel with OAM for travel of senior Federal officials or local aviation manager. The office supporting the travel will—

(1) Contact OAM or local aviation manager in a timely manner to advise of the traveler's intended need for air travel.

(2) Provide OAM or local aviation manager and either the Office of General Counsel or Chief Counsel, as appropriate, with the following information at least ten working days before the scheduled travel date:

(a) purpose of the proposed travel (e.g., mission requirements travel, required use travel, political travel, non-official travel, Presidentially directed travel);

(b) dates and itinerary of travel;

(c) names, titles and affiliations of persons traveling;

(d) reason why each traveler must be present;

(e) any special aircraft requirements including aircraft type, special seating, secure phones, catering, etc.; and

(f) names of organizations or individuals responsible for reimbursement, including reimbursement for any non-official travel.

(3) Assist OAM with arrangements for international travel.

h. Offices of the General Counsel and Chief Counsels. The Office of the General Counsel has certain responsibilities regarding travel by senior Federal officials and non-Executive branch employees, including approving their air travel on DOE Government aircraft. It also has responsibility for approving all required use travel regardless of the identity of the traveler. The Offices of Chief Counsel have the responsibility for approving air travel on DOE government aircraft that is cost justifiable for Executive branch employees who are not senior Federal officials. It is important to note that the Office of the General Counsel does not approve the aircraft itself but approves the travel of travelers. The Offices of the General Counsel and Chief Counsel—

(1) approves the travel of all travelers on trips using DOE Government aircraft, other than mission requirements travel,

(2) coordinates in a timely manner with OAM for approval of the traveler to travel aboard Government aircraft when required,

(3) ensures that the purpose of the proposed travel meets legal requirements,

(4) retains copies of travel approvals for at least 2 fiscal years after the current year for audit purposes,

(5) will seek approval for the use of aircraft for required use travel from the Office of the Counsel to the President, if required, and

(6) determines whether reimbursement to the Government is required for non-Federal travelers.

i. Office of Aviation Management.

(1) Supports the Director, Office of Aviation Management in carrying out the responsibilities assigned by the Secretary.

(2) Supports the Office of the Secretary, other Headquarters offices, and field elements as requested, by assisting in determining appropriate aircraft resources to meet travel needs, planning specific trips, conducting safety analyses, conducting cost comparisons of available transportation modes, and procuring or arranging the procurement of necessary services.

(3) Tasks the field or operations office to provide flight itinerary information if Federal aircraft are to be used for travel.

(4) Has authority for aircraft charter procurement to support Headquarters offices for a total cost not to exceed $25,000.

(a) Coordinates the appropriate fund sites for charter aircraft services of less than $25,000 (preprocurement) with the Office of Management, Budget and Evaluation and the NNSA, if applicable; requests reservations and obligation of funds; procures charters; and coordinates schedules, approvals, and services with the traveler's offices, the Office of the General Counsel, and the travel approving authority.

(b) Coordinates any procurement in excess of $25,000 with the Headquarters Office of Procurement and Assistance Management.

(5) If the source of travel services is foreign, OAM will coordinate the procurement with all relevant parties and the U.S. Embassy of the country(ies) involved.

j. Aviation Program Manager (APM).

(1) Establishes goals for the field aviation program based on the anticipated requirements of the Department, the field element, and other Departmental organizations that may require aviation services.

(2) Implements DOE aviation management and safety policy and establishes the field element's standards for the aviation program that will ensure an effective, safe, secure and cost efficient operation.

(3) Develops the organization's Aviation Implementation Plan (AIP). Annually reviews the AIP to ensure that it is current.

(4) Provides direction to aviation contractors regarding required aviation services. This includes the types of missions that are required and the regulations, policies, and standards that contractors are to follow.

(5) Reviews, evaluates, and monitors cost, performance, and technical competency of aviation contractors.

(6) May be appointed, or has collateral duties, as an Aviation Safety Officer for the field element aviation program. Provides direction to the Aviation Safety Officer based on the needs of the program.

(7) Provides required reports and information to the Department regarding field element aviation activities, including reports required by Office of Management and Budget (OMB) Circulars A-76, Performance of Commercial Activities, and A-126, Improving the Management and Use of Government Aircraft.

(8) Complies with Department, Federal, and State requirements concerning aviation activities.

(9) Acts as a voting member of the Department's Aviation Board of Directors.

(10) Implements an integrated safety management system as required by DOE P 450.4, *Safety Management System Policy*.

k. Aviation Safety Officer (ASO).

(1) Develops and implements a field aviation safety program appropriate to the scope of operations, including instituting safety goals and publicizing them with program participants.

(2) Gathers, trends, and analyzes aviation safety performance data to ensure the safety of the field aviation program.

(3) Implements an integrated safety management system as required by DOE P 450.4.

(4) Conducts periodic assessments of aviation activities to ensure that requirements, policies, and procedures are implemented and followed. Conducts assessments of charter aircraft operators to ensure the safety of charter aircraft operations.

(5) Prepares reports documenting assessment findings, concerns, and recommendations and tracks corrective actions to help prevent similar occurrences.

(6) Participates as directed in aviation accident or incident investigations. Provides assistance to accident investigation boards during their investigations.

(7) Identifies and reports safety concerns to the aviation manager and works to eliminate potential hazards.

(8) Reports safety concerns directly to the field element manager when he/she believes that the field element manager's intervention is required.

(9) Develops Aviation Safety Documents (ASD) for aviation activities that are outside the scope of activities covered by established regulations and policy. ASDs will address potential hazards associated with the activity and methods to mitigate these hazards.

(10) Ensures that aviation personnel report mishaps, hazards, and concerns to the Occurrence Reporting and Processing System (ORPS) or the Aircraft Accident Incident Reporting System (AAIRS).

(11) Participates in the Department's Aviation Safety Awards Program to ensure that organizations and personnel are recognized for their contributions toward providing the Department with a safe aviation program.

l. Flight Readiness Review Board (FRRB).

(1) The purpose of the Board is to evaluate the safety, design, operational planning, and functional adequacy of the aircraft operations that are not regulated or cannot comply with the applicable parts of 14 CFR Chapter 1, the Federal Aviation Regulations or 49 CFR Subchapter C.

(2) The Board must be appointed by the field element's aviation manager or aviation safety officer or the field element manager's designee. The aviation manager or designee must act as a coordinator for the Board; all Board deliverables must come through the field element's aviation safety officer.

(3) The Board must be composed of subject matter experts as determined by the field element's designee, aviation manager, or safety officer.

(a) As a minimum, the Board must be composed of a Board Chair and two members.

(b) Concurrence with the selection of the Board membership must be obtained from the program under review.

(c) The input and assistance of Board advisors and consultants may be solicited and used, however, the deliverables are the sole responsibility of the Board.

(4) Prior to the initiation of flight operations, conduct an independent review of the total project to assure that adequate planning and preparation have been accomplished to achieve the desired results under acceptable safety conditions.

(5) Provide technical recommendations to the responsible program.

(6) Maintain effective communications among Board members, program, field element personnel, and OAM, if applicable.

(7) The Board must submit a formal report of Board findings and recommendations to the affected program(s), field element's manager and the OAM. The report must be submitted in timely enough to allow for effective implementation of recommendations.

m. Contracting Officer. The contracting officer, after being notified of the affected contracts, will incorporate the CRD into the affected major facilities management contracts by way of the laws, regulations, and directives clauses found in the Department of Energy Acquisition Regulations.

6. CONTACT. Questions concerning this Order should be directed to DOE Headquarters OAM at 202-586-5532.

BY ORDER OF THE SECRETARY OF ENERGY:

KYLE E. MCSLARROW
Deputy Secretary

CONTRACTOR REQUIREMENTS DOCUMENT

DOE O 440.2A, *AVIATION MANAGEMENT AND SAFETY*

A. Regardless of the performer of the work, the Department of Energy (DOE) contractor is responsible for compliance with the requirements of the Contractor Requirements Document (CRD) after it is incorporated into the contract. The contractor is responsible for flowing down the requirements of the CRD to subcontracts at any tier to the extent necessary to ensure the contractor's compliance with the requirements.

B. Contractors that only use Commercial Aviation Services (CAS), as defined in Attachment 2, in support of programmatic needs must have a program that complies with the field office Aviation Implementation Plan and the following requirements:

1. Requires the vendor or contractor that provides CAS to comply with the civil standards (Title 14 CFR, Chapter1 and 49 CFR, Chapter XII) applicable to the type of operations conducted while in service to the Department or its contractor.

2. Ensures the vendor or contractor that provides CAS has a Federal Aviation Administration- (FAA-) accepted or FAA approved continued airworthiness maintenance and inspection program [Title 14 CFR, Chapter 1, Part 91.409 (g)], applicable to the type and model aircraft operated, if operating former military aircraft, other than (1) aircraft owned by the Armed Forces or operated on behalf of the U.S. Government by Armed Forces personnel as defined by United States Code (U.S.C.) Title 10 or (2) aircraft owned and operated by the National Guard.

3. Requires a passenger manifest be completed and maintained.

   a. A copy of the manifest will be kept at the office of the responsible authority for 2 fiscal years following the year during which the flight occurred; and

   b. As a minimum, the manifest will consist of the full name of each passenger 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.

4. Requires CAS providers perform weight and balance calculations to ensure that aircraft are within the 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.

5. Establishes a comprehensive, integrated aviation safety program. The program will—

a. define the work (e.g., the type(s) of aircraft operations to be conducted, missions, area(s) of operations);

b. establish risk analysis and risk management procedures to identify hazards, including associated potential event initiated accidents and implement safety administrative and/or engineering controls to prevent or mitigate postulated hazards related accidents in order to mitigate hazards and manage risk to an acceptable level;

c. conduct work along with associated required operations within established controls;

d. conduct independent, internal assessments and oversight to verify that the standard elements required are implemented;

e. establish a system for providing internal feedback on safety issues; communicating and reporting hazards, incidents, and accidents; and disseminating safety/accident prevention and related information;

f. participate in the GSA's Aircraft Accident Incident Reporting System and any other accident or incident reporting systems prescribed by DOE policy;

g. participate in the DOE Aviation Safety Awards Program; and

h. develop an accident response plan that includes—

1 procedures for notifying NTSB and DOE of accidents and incidents [49 CFR 830, "Notification and reporting of aircraft accidents or incidents and overdue aircraft, and preservation of aircraft wreckage, mail, cargo, and records"; DOE O 225.1A, Accident Investigation; and DOE O 232.1A, Occurrence Reporting and Processing of Operations Information], and

2 procedures that address the contractor's support of DOE responsibilities established in the Federal Plan for Aviation Accidents Involving Aircraft Operated by or Chartered by Federal Agencies, NTSB Report Number SPC-99-04.

6. Develops aviation safety documentation for each mission that has risks not normally accepted by the public. Risks not normally accepted by the public, is defined as an aircraft operation, other than aerial transportation of personnel and cargo, aerial patrols, aerial photography, aerial survey, rotorcraft external load operations, and aerial application, that is not regulated or cannot comply with the applicable parts of 14 CFR Chapter1, the Federal Aviation Regulations or 49 CFR Subchapter C.

7. Ensures CAS providers are evaluated by a qualified aviation person or Department's designee before the initiation of flight operations and, if a continuing need exists, evaluations must be conducted every 24 months thereafter.

8. Requires the CAS provider to give passenger safety briefings [Title 14 CFR Chapter 1, Part 135 or 121] and that fulfill the requirements established in the 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)

9. Establishes reporting requirements to ensure CAS are effectively used, program needs are met, and accurate information is obtained to report accountability to appropriate oversight entities. In addition, the information will be used by Field elements and the OAM to improve coordination and scheduling of programmatic research and development needs with available aviation assets. Requirements related to reporting are as follows:

   a. Each contractor operating, using, or sponsoring the use of Government aircraft (see Attachment 2, Definitions) must appoint a responsible individual to maintain the required records and reports of aircraft use and the other required reports established by this Order. The name of the responsible individual must be provided to Field element manager or designee.

   b. Each contractor involved with research and development work requiring the use of an aircraft or ROA (see Attachment 2, Definitions) must file the mission profile with the Departmental Aircraft Coordination Database or the OAM before operations. The report should include the following information:

      1 estimated payload requirements;

      2 anticipated or desired altitudes of operations;

      3 areas of operations;

      4 any limitations as far as air or ground speeds during the test;

      5 desired endurance (time aloft); and

      6 anticipated dates or planned dates of deployments.

      At a minimum, items noted in paragraphs (b) 1, 3 and 6 must be transmitted to the Departmental Aircraft Coordination Database or the OAM as soon as the contractor sponsoring or conducting the aircraft operation(s) becomes aware of the need for aircraft.

c. Each contractor is required to submit quarterly reports of flight hours, costs, and other relevant information to the Field 's Aviation Program Manager or designee as required by Federal Property Management Regulations or successor regulations promulgated by GSA.

d. Each contractor must report accepted vendors to the OAM or the DOE Charter Aircraft Database as soon as possible.

10. Requires employees or subcontract employees to obtain approval from the DOE Offices of General Counsel or Chief Counsel prior to traveling on-board Government aircraft, other than mission requirements travel.

C. Contractors that operate and maintain Federal aircraft must have a program that complies with the field office Aviation Implementation Plan and includes:

1. Management/Administration.

a. The contractor must establish—

(1) a management structure, appropriate in size and scope, that is responsible for the administration, operation, safety, training, maintenance, security and financial needs of DOE-owned aircraft operations;

(2) roles, responsibilities, and authorities of assigned managers, pilots, maintenance personnel, flight crew members, flight safety personnel, and dispatchers, as applicable;

(3) procedures to track and record flight crew member duty time, flight time, and training;

(4) procedures to track and record maintenance personnel duty time and training; and

(5) cost accounting systems that record the costs of operations and maintenance [see General Services Administration's (GSA's) Cost Accounting Guide; Office of Management and Budget (OMB) Circular A-76, Supplement, Annex 6; Federal Property Management Regulations or successor regulations promulgated by GSA; and costs associated with the type of aircraft operation, benefitting activity, and mission for each flight]

b. Aviation management personnel must—

(1) have qualifications commensurate with their duties, responsibilities, and authorities;

(2) have experience similar to the civil requirements established for management personnel conducting similar flight operations; and/or

(3) meet the qualifications and training requirements defined in paragraph 4, if the management personnel act in any capacity as a flight crew member.

2. Operations.

a. The contractor must establish—

(1) basic qualifications and currency requirements for the pilots, crew members, maintenance personnel, and other mission-related personnel, as required by the DOE field element's approved AIP;

(2) duty and flight limits appropriate to the type of operation being conducted, (e.g., limits on the time an employee is on call, standby, or ready reserve);

(3) methods or processes for proving compliance with Agency and manufacturer safety-of-flight notices and operational bulletins;

(4) procedures to provide for timely notification of management and initiation of search and rescue operations in case of a lost or downed aircraft;

(5) passenger safety briefings [Title 14 CFR Chapter 1, Part 135 or 121] (required by Federal Aviation regulations) and that fulfill the requirements established in the 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);

(6) appropriate emergency procedures and equipment, including personnel and aircraft evacuation procedures;

(7) a program for ensuring aviation life support equipment, if required for a specific mission, is inspected and serviceable;

(8) written policies and procedures for the type of aircraft operations conducted;

(9) an operations management tracking and review process (using existing data systems where possible) that provides managers key performance indicators on a regular basis. Examples are number of flights and flight hours by pilot per month, air crew member training status per crew member per month, pilot proficiency (events) per pilot per month, operational effectiveness, aircraft and crew scheduling effectiveness, cost effectiveness, etc.; and

(10) policies that require Federal aircraft in service to the Department be operated and maintained in accordance with the applicable parts of Title 14 Code of Federal Regulations (CFR) Chapter 1, 49 CFR Chapter XII and/or equivalent international standards appropriate for the operations and type of aircraft in service.

b. It is the Department's policy that supplemental pilots (see Attachment 2, Definitions) not be used as an alternative to full-time pilots. However, it is recognized that there are certain limited instances where a supplemental pilot may provide a cost effective supplemental capacity to meet specific unfulfilled flight crew member requirements. The qualifications and processes for using supplemental must be in accordance the field office AIP and incorporated into the contractor's, if applicable, aviation procedures or operations manual. The use of supplemental pilots is prohibited unless the pilots meet the following criteria:

(1) hold an appropriate pilot rating for the operation being conducted and a type rating, if required;

(2) have a valid FAA Class II or Class I medical certificate, as prescribed by Title 14 CFR, Chapter 1;

(3) For instrument ratings,

(a) Airplane pilots must hold an instrument rating and be current; and

(b) Helicopter pilots must hold an instrument rating, if the operation requires flight under instrument conditions;

(4) have a minimum 1500 hours as a pilot-in-command in the category and class of aircraft to be flown;

(5) have a minimum 500 hours as pilot-in-command in the make and model aircraft to be flown;

(6) log at least 15 hours as a pilot in the make and model of aircraft to be flown during the 45 days preceding initial assignment as a flight crew member and, thereafter, maintain pilot proficiency and qualifications in accordance with the field element's requirements, if the pilot is used on a recurring basis;

(7) complete an initial training course, conducted by the organization, that includes orientation flights in the type of mission to be flown, and addresses

crew resource management and any identified hazards associated with the area or type of operation;

(8) pass an initial check ride given by the individual in the field organization designated as the Chief Pilot or Check Airman, before any flight operations;

(9) have a minimal impact on the ability of the full-time flight crew members to maintain proficiency; and

(10) be limited to assignment as second-in-command pilot duties only.

c. The contractor must obtain the approval from the Director, Office of Aviation Management or designee, for contract or subcontract supplemental pilots to act as pilots-in-command of Federal aircraft on an individual basis.

3. Maintenance/Inspection Programs.

a. The contractor must establish—

(1) aircraft maintenance and inspection programs to ensure the safety of flights in accordance with either applicable manufacturers' programs, FAA-approved inspection programs, or continuous maintenance programs [see 14 CFR 91, 121 or 135];

(2) processes or procedures to obtain applicable technical support, including appropriate engineering documentation and testing, for aircraft, powerplant, propeller, or appliance repairs, modifications, or equipment installations;

(3) quality control processes for the purchase and acquisition of replacement parts, ensuring that parts purchased or acquired have the necessary documentation to determine airworthiness;

(4) procedures to record and track maintenance actions; inspections; the flight hours, cycles, and calendar times for retirement life components, parts and for Flight Safety Critical Aircraft Parts (i.e., Department of Defense surplus/excess);

(5) policies and procedures on returning aircraft to service after maintenance and inspection;

(6) requirements, processes, and procedures for the operation of aircraft with inoperable equipment; and

(7) procedures or processes to ensure the integrity and quality control of maintenance actions by ensuring that maintenance performed by one qualified individual on critical areas of an aircraft are checked and documented by another qualified individual who did not perform the work. Critical areas must include as a minimum the following:

(a) removal or installation of a component or part of a flight control;

(b) removal or installation of any component or part of a main drive or tail rotor drive system;

(c) removal or installation of a component or part of a main or tail rotor hub assembly;

(d) removal, disassembly, reassembly or installation of a power turbine, compressor, gearbox, combustion section or a removal and installation of a complete powerplant assembly;

(e) removal or installation of a fuel control or governor of a powerplant;

(f) removal or installation of a propeller governor or reduction gearbox;

(g) removal or installation of a component or part of a fuel system;

(h) removal or installation of a propeller assembly or blade;

(i) removal or installation of any component or part associated with the landing gear of a fixed-wing aircraft;

(j) removal or installation of internal or external mission equipment by technicians or scientists who do hold and Airframe and Powerplant certificate [see 14 CFR, Chapter 1, Part 65]; and

(k) procedures for maintenance of any of the identified critical systems when an aircraft is away from home base.

b. The contractor must comply with the Department's safety-of-flight notices, FAA airworthiness directives, and or mandatory manufacturers' bulletins applicable to the types of aircraft, engine(s), propeller(s), and appliances in their aircraft operations.

c. The contractor must implement a maintenance management tracking and review process (using existing data systems where possible) that provides managers information on key elements of performance (i.e., performance indicators) on a

recurring and systematic basis. Examples include maintenance effectiveness, scheduling effectiveness; parts and supply logistics effectiveness; cost effectiveness; and reliability rates of aircraft, powerplants, propellers, and systems.

d. The contractor must report to the FAA within 72 hours after a contractor discovers any serious defect in, or other recurring unairworthy condition of, an aircraft, powerplant, or propeller, or any component of any of them. The contractor must file the report using the Web-based, Internet-accessible FAA Service Difficulty Reporting System or the FAA accepted Helicopter Association International's Maintenance Malfunction Information Report System, the report shall describe the defect or malfunction completely without withholding any pertinent information. If the defect or malfunction could result in an imminent hazard to flight, the contractor must use the most expeditious method it can to inform the FAA and the DOE Aviation Manager or Safety Officer.

4. Training.

a. Flight crew members and maintenance personnel must complete initial training and recurrent training appropriate for their responsibilities and relevant to the types aircraft and operations/missions conducted by the Agency. The training must—

(1) be events based;

(2) measure performance;

(3) meet FAA standards and minimum standards established by the field office;

(4) include measures taken to correct identified deficiencies;

(5) be tracked per pilot and mechanic;

(6) be tracked per aircraft type, make, and model; and

(7) be documented to provide for outside oversight and appraisal.

b. Flight crew members and maintenance personnel must demonstrate proficiency in operational and maintenance tasks relevant to the types of aircraft and operations/missions conducted by the Department. The contractor must establish the tasks or skills to be measured and proficiency goals for each.

c. Flight dispatchers and cabin safety personnel must complete initial training and recurrent training appropriate for their responsibilities and relevant to the types of aircraft and operations/missions conducted by the Agency.

5. A comprehensive, integrated aviation safety program. Each contractor must—

a. define the work (e.g., the type(s) of aircraft operations to be conducted, missions, area(s) of operations);

b. establish risk analysis and risk management procedures to identify hazards, including associated potential event initiated accidents and implement safety administrative and/or engineering controls to prevent or mitigate postulated hazards related accidents in order to mitigate hazards and manage risk to an acceptable level;

c. conduct work along with associated required operations within established controls;

d. conduct independent, internal assessments and oversight to verify that the standard elements required by this Order are implemented;

e. establish a system for providing internal feedback on safety issues; communicating and reporting hazards, incidents, and accidents; and disseminating safety/accident prevention and related information;

f. participate in the GSA's Aircraft Accident Incident Reporting System and any other accident or incident reporting systems prescribed by DOE policy;

g. participate in the DOE Aviation Management and Safety Awards Program; and

h. develop an accident response plan that includes—

(1) procedures for notifying NTSB and DOE of accidents and incidents [see definitions provided at 49 CFR 830, "Notification and reporting of aircraft accidents or incidents and overdue aircraft, and preservation of aircraft wreckage, mail, cargo, and records"; DOE O 225.1A, *Accident Investigation*; and DOE O 232.1A, *Occurrence Reporting and Processing of Operations Information*] and

(2) procedures that address the contractor's support of DOE responsibilities established in the Federal Plan for Aviation Accidents Involving Aircraft Operated by or Chartered by Federal Agencies, NTSB Report Number SPC-99-04.

6. Establishing policies and procedures to ensure the safety and airworthiness, for contractors that conduct Remotely Operated Aircraft (ROA) operations (see Attachment 2, Definitions), outside the scope of Title 14 CFR, Chapter 1. The policies and procedures, which must be reviewed by the Departmental field office and have concurrence from the Director, OAM. The OAM Director must review and concur with the policies and procedures submitted by DOE elements that are not part of the NNSA. The OAM Director will review and make recommendations for or against approval to the Administrator for Nuclear Security on ROA policies and procedures submitted by NNSA elements. If a difference of opinion develops between the Director, OAM, and the NNSA Administrator regarding whether a ROA policy or procedure should be approved they will bring the issue to the Secretary or Deputy Secretary for resolution or direction. The following requirements must be established:

   a. Fail-safe Principles. Fail-safe principles will govern the design of ROA flight critical systems. The flight critical systems must be independent and/or adequately redundant with back-up features that will provide for safe functioning of the ROA in the event of flight critical system failure.

   b. Failure Detection. Any system design must provide a failure detection apparatus (preflight and in-flight built-in-test) that will notify the ROA operator of a flight critical system failure.

   c. Flight Control and Navigation Software Verification and Validation. All ROA flight control and navigation system software verification and validation activities must be performed in accordance with Radio Technical Commission for Aeronautics (RTCA) Design Objective 178B or current RTCA or other FAA standards.

   d. Flight Control System. The flight control system must include the ROA operator controls, sensors, computers, and actuation parts necessary to control the ROA flight trajectory throughout the entire mission profile and ensure the following:

      (1) adequate stability throughout the expected flight envelope;

      (2) any single failure of the flight control system will not significantly affect the operator's ability to control ROA recovery;

      (3) provisions for possible revision to degraded modes of operation are incorporated into flight control system design; and

      (4) the ROA will remain controllable in the event of propulsion system failure.

e. Electrical System. The electrical system must provide sufficient power and endurance to ensure safe operations and recovery throughout all phases of flight. In the event of an emergency, the electrical system or emergency power supply should be of sufficient capacity to enable recovery at either the intended or a predetermined/alternate recovery area.

f. Communications System/Data Link(s). Approval for all frequencies used in ROA operations must be obtained from the Federal Communications Commission.

(1) The maximum range of the communication link must be determined and sustained by the ROA operator.

(2) Any single failure of the communications system (uplink or downlink) must not affect normal control of the ROA.

(3) Uplinks/downlinks are sensitive to electromagnetic interference and must be adequately protected from this hazard.

(4) Aircraft designs must incorporate provisions for recovery of the ROA in the event of temporary or total loss of the communication system.

g. Navigation System. The aircraft navigation system must meet the required navigation performance standards for the airspace classification in which the operations are to be conducted (see Attachment 3, Table 2). Navigation system designs must also consider the complexity and level of air traffic operations found in the airspace in which the ROA will operate. Operation of ROAs in the National Airspace System (NAS) must have FAA approval (see Attachment 3), except within the boundaries of the NAS classified as restricted airspace or warning areas.

h. Propulsion System. All essential elements of the propulsion system, including the engine, engine controls, propeller, propeller components, actuators, and essential sensors, must meet documented reliability standards established by industry or U.S. specifications or comply with Attachment 3.

i. Aircraft Control Station. Manned aircraft cockpit features (e.g., control placement and ease of control column forces) do not have to be duplicated exactly.

(1) Station design must facilitate control of the ROA by the internal pilot and provide for unambiguous operations and clear indications of ROA flight status.

(2) Design criteria must minimize the potential for human error. All "conventional" flight indications and warnings necessary to ensure safe control of the ROA flight path must be provided. In particular, the ROA pilot must be informed of any degraded mode of operations due to any failure, including cases in which there is an automatic switching to an alternate or degraded mode of operation.

(3) The control station must include a diagnostic and monitoring capability for the status of the ROA. Real-time, direct communication/surveillance and/or latent data transmission capability must be provided in the absence of failure.

(4) For operations in controlled airspace, direct communication with the FAA controlling agency must be incorporated into the ROA control station system design.

(5) If more than one ROA operation is occurring at the same time and the ROAs are being controlled from the same terminal, conduct an evaluation of the tasks required by the operator/pilot: determine if adequate controls and monitors exist; and that operator workload is such that control can be maintained to operate the simultaneous ROA operations. Considerations should be given to whether one or more of the ROAs are under autonomous control or manual control by the operator pilot.

(6) If an external operator pilot, (other than the operator in the control station) is used during the takeoff and landing phases of the flight, receives flight parameter information from the aircraft control station through an intercommunication system, the intercommunication system between the operator and the control station must be as reliable as conventional aircraft communication systems.

j. Flight Termination System. The ROA operator must have a means of safely terminating flight of the vehicle or aircraft in all phases of flight operations. The flight termination system must avoid the use of explosives to the maximum extent possible.

k. Airworthiness. A statement indicating compliance with the listed or otherwise identified sections in Attachment 3 or compliance with14 CFR Part 21.17 (b), as applicable, must be submitted by the ROA operator or manufacturer.

(1) An operator or manufacturer may substitute alternate data in place of the data listed in Attachment 3. The data must specifically address the substituted paragraph(s) and note the substitution in the compliance statement. The alternate data must also provide a level of safety at least

equivalent to the level of safety specified in Attachment 3, Table 1. All alternate data must be documented; a DOE Flight Readiness Review Board will make the final determination regarding the justification and merit of the proposed alternate data.

(2) FAA Advisory Circulars 43.13-1B and 43.13-2A, Change 2, must be used by repairmen or technicians in the fabrication, installation, and repair of the airframe and components.

7. Aviation safety documentation for each mission that has risks not normally accepted by the public must be developed. Risks not normally accepted by the public, is defined as an aircraft operation (other than aerial transportation of personnel and cargo, aerial patrols, aerial photography, aerial survey, rotorcraft external load operations, and aerial application) that is not regulated or cannot comply with the applicable parts of 14 CFR Chapter1, the Federal Aviation Regulations or 49 CFR Subchapter C.

8. Requirements for a vendor or contractor that provides CAS to comply with the civil standards (Title 14 CFR Chapter 1 and 49 CFR Chapter XII) applicable to the type of operations conducted while in service to the Department or its contractor.

9. A Federal Aviation Administration (FAA)-accepted or FAA-approved continued airworthiness maintenance and inspection program [Title 14 CFR, Chapter 1 Part 91.409 (g)], applicable to the type and model aircraft operated, if operating former military aircraft, other than (1) aircraft owned by the Armed Forces or operated on behalf of the U.S. Government by Armed Forces personnel as defined by United States Code (U.S.C.) Title 10 or (2) aircraft owned and operated by the National Guard.

10. Requirements for a passenger manifest be completed and maintained.

    a. That a copy of the manifest will be kept at the office of the responsible authority for 2 fiscal years following the year during which the flight occurred; and

    b. As a minimum, the manifest will consist of the full name of each passenger 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.

11. Requirements to perform weight and balance calculations for Federal and CAS providers to ensure that aircraft are within the 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.

12. CAS providers to be evaluated by a qualified aviation person or DOE designee before the initiation of flight operations. If a continuing need will exist, evaluations must be conducted every 24 months thereafter.

13. Accurate information be obtained to facilitate the reporting accountability to appropriate oversight entities. In addition, the information will be used by field office manager and the OAM to improve coordination and scheduling of programmatic research and development needs with available aviation assets.

    a. Each contractor operating, using, or sponsoring the use of Government aircraft must appoint a responsible individual to maintain the required records and reports of aircraft use and the other required reports established by this Order. The name of the responsible individual must be provided to field office manager or designee.

    b. Each contractor involved with research and development work requiring the use of an aircraft or ROA must file the mission profile in the Departmental Aircraft Coordination Database or with OAM before operations. The report must include the following information:

        (1) estimated payload requirements;

        (2) anticipated or desired altitudes of operations;

        (3) areas of operations;

        (4) any limitations as far as air or ground speeds during the test;

        (5) desired endurance (time aloft); and

        (6) anticipated dates or planned dates of deployments.

        At a minimum, items noted in paragraphs 143 (b) 1, 3 and 6 must be transmitted to the Departmental Aircraft Coordination Database or the OAM as soon as the program office sponsoring the aircraft operation(s) becomes aware of the need for aircraft.

    c. Each contractor that manages and operates Federal aircraft involved with research and development work, including a ROA, must provide the following information to the Departmental Aircraft Coordination Database or the Director, OAM, on a quarterly basis. The report must include the following information:

        (1) aircraft type(s);

(2) aircraft make(s) and model(s);

(3) date(s) aircraft is/are available;

(4) number of days aircraft is/are available; and

(5) any limitations, such as number of flight hours aircraft can be used, altitude restrictions, airspeed restrictions, or payload restrictions.

d. Each contractor is required quarterly reporting of flight hours, costs, and other relevant information to the Federal Aviation Interactive Reporting System as required by Federal Property Management Regulations or successor regulations promulgated by GSA. Accepted vendors must be reported to OAM or the DOE Aircraft Charter Database as soon as possible.

14. Requirements for employees or subcontract employees to obtain approval from the DOE Offices of General Counsel or Chief Counsel prior to traveling on-board Government aircraft, for other than mission requirements travel.

DEFINITIONS

a. (Aircraft) Accident. An occurrence associated with the operation of an aircraft that takes place between the time any person boards the aircraft with the intention of flight and all such persons have disembarked and in which any person suffers death or serious injury or the aircraft receives substantial damage.

b. Approved Commercial Aviation Services. A commercial aircraft service provider that has been reviewed by representatives of the Department and found to meet the safety and operational standards established by the Department for aviation operations. A list of approved commercial aircraft service providers may be found in the "Aircraft Charter Database" maintained by OAM. DOE Federal aircraft are included in this database; however, regularly scheduled domestic airlines are not reviewed by the Department and are not included in the database.

c. 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. This person is also responsible for reviewing travel vouchers to ensure that the traveler performed the travel as authorized.

d. Aviation Implementation Plan (AIP). A written document prepared to identify the programs, management roles, responsibilities, and 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..

e. 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.

f. Commercial Aviation Services. Include the following:

(1) leased aircraft;

(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 Federal aircraft.

g. Company Aircraft. Any of the following: Corporate owned, privately owned, or aircraft owned by a non-profit organization or union that is not engaged in commercial purposes or for hire to the general public.

h. Crew Member. A person assigned to operate or assist in operating a Government aircraft during flight time. Crew members 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).

i. DOE Element. Any of the following: Program Secretarial Offices, Power Marketing Administrations, National Security Administration, Operations Offices, Special Projects Offices, National Laboratories, etc., that are part of the United States Department of Energy.

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

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

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

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

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

o. 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.

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

q. 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. Travel aboard Government aircraft for purposes of attending meetings, site visits, or conferences or making speeches are examples of travel that are not mission requirements travel.

r. Official Travel. Means (i) travel to meet mission requirements, (ii) required use travel, and (iii) other travel for the conduct of agency business.

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

t. Private Aircraft. Aircraft owned by an individual, corporation or company that is not engaged in commercial purposes or for hire to the general public.

u. Qualified Non-Crew Member. A person flying onboard a Government aircraft whose skills, duties or expertise are essential to performing or associated with performing the (non-travel related) 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.

v. 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.

w. Senior Federal Official. Are persons:

(1) employed at a rate of pay specified in or fixed according to subchapter II of chapter 53 of title 5 of the U.S. Code;

(2) employed in a position in an Executive Agency, including any independent agency, at a rate of pay payable for level I of the Executive Schedule or employed in the Executive Office of the President at a rate of pay payable for level II of the Executive Schedule;

(3) employed in a position in an Executive Agency that is not referred to in clause (i) (other than a position that is subject to pay adjustment under Section 1009 of Title 37 of the U.S. Code) and for which the basic rate of pay, exclusive of any locality-based pay adjustment under section 5304 of title 5 of the U.S. Code (or any comparable adjustment pursuant to interim authority of the President), is equal to or greater than the rate of basic pay payable for the Senior Executive Service under Section 5382 of title 5 of the U.S. Code; or

(4) appointed by the President to a position under section 105(a)(2)(A), (B), or (C) of title 3 of the U.S. Code or by the Vice President to a position under section 106(a) (1) (A), (B), or (C) of title 3 of the U.S. Code.

Generally, these are persons employed by the White House and executive agencies, including independent agencies, at a rate of pay equal to or greater than the minimum rate of basic pay for the Senior Executive Service. Exempted from this definition, for purposes of this order, are active duty military officers.

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

y. 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.

z. Remotely Operated Aircraft (ROA). For the Department of Energy, a ROA is a powered aircraft; with a 61-knot or less Vso stall speed as defined in Title 14 CFR Chapter 1, Part 23, Sec. 23.49; or is a rotorcraft with a 6-pound per square foot main rotor disc loading limitation, under sea level standard day conditions; has a vehicle gross weight of 500 pounds to 12,500 pounds; is capable of flight beyond visual line of sight under remote or autonomous control for civil (non-Department of Defense) purposes. An ROA is not operated for sport or hobby and does not transport passengers or crew.

REMOTELY OPERATED AIRCRAFT OPERATIONS AND AIRWORTHINESS

BACKGROUND

Starting in 1994, Department of Energy (DOE) Headquarters aviation personnel initiated a review of DOE policies and standards for Unmanned Air Vehicle (ROA) operations. Working with FAA Headquarters personnel, field, laboratory, and FAA field representatives DOE developed an interim ROA guidance that was implemented on December 22, 1994. That guidance is now codified within DOE O 440.2A, *Aviation Management and Safety*. This attachment provides more detailed information for the field to comply with the requirements of the Order regarding ROA operations and airworthiness.

Experience has been gained with ROAs operated by the Department of Defense (DoD) in Special Use Airspace. However, because civilian use of ROAs in the National Airspace System (NAS) is limited, there is a lack of civilian experience in ROA operations and a lack of data relating to ROA use in non-DoD operations.

ROAs incorporate state-of-the-art technologies that require more complex designs, fabrication techniques, and systems integration when compared to manned light aircraft. These include—

- Airframe structural design
- Design and testing practices
- Materials and components selection and applications
- Flight controls and programming
- Data communication/telemetry links
- Navigation systems
- Power management
- Configuration control
- Pilot and air crew training and procedures
- Flight testing programs definition and management
- ROA maintenance and inspection requirements
- Hazardous materials
- Operational hazards mitigation
- Ground-station operations and maintenance procedures

FINDINGS

1. ROAs conducting research missions cannot be expected to operate at an equivalent level of safety as certified, manned aircraft because there is nobody onboard the aircraft. In lieu of an onboard pilot, there is a multitude of complex onboard and ground systems between the pilot and the controls of the aircraft.

2. Since ROA systems are more complex, higher skill levels are needed to support ROA operations. Therefore, proficiency and currency are important requirements for the pilots/operators, maintenance technicians, and logistics personnel.

3. ROA mission safety has been achieved primarily through the reliability of system components (hardware/software) and the ability to design, test, install, operate and maintain them correctly.

4. ROA mission success depends heavily on the availability of several systems external to the aircraft such as satellites, ground control stations, and relay aircraft.

5. Given total system complexity, the checklists for the aircraft, payload, ground station, etc., are more complex, and pre-flight preparations are time consuming.

6. ROAs rely on radio communications and are susceptible to interference and jamming.

7. ROA operations and training are unique and require highly specialized pilots and other operational personnel.

8. Operators of ROAs should have a comparable level of training and aeronautical experience on the safe use of their specific ROA as a comparable type of manned aircraft.

9. The ROA pilot/operator should comply with the experience and proficiency requirements contained in FAR 61 with appropriate modifications recommended by the ROA manufacturer/owner and concurred with by the Flight Readiness Review Board. Also, a third-class medical certificate should be held by the ROA pilot.

10. The Title 14 CFR, Chapter 1, "Federal Aviation Regulations" (FAR) parts validation review substantiated the following:

    a. The use of applicable sections of Parts 21, 23, 33, 35, and 43 along with Part 91 and Advisory Circular 43.13-1B and 43.13-2A, change 2, do provide valid guidance and baseline reference material for evaluating ROAs until formal FAA standards are developed.

    b. When evaluating a new ROA design, the use of selected portions of FAR Part 23 for small fixed-wing aircraft in combination with subjective evaluations by Designated Engineering Representatives (DERs) and Designated Airworthiness Representatives (DARs) is recommended until FAA regulations are published. For other types of aircraft compliance with 14 CFR Part 21.17(b) in combination with subjective evaluations by DERs and DARs is recommended.

c. The ROA flight readiness review process adopted by DOE should incorporate the use of the FAR 23 checklist (see Table 1), developed as a guide to ensure compliance with DOE requirements.

d. The results of the 1994 review directed toward evaluating the completeness of DOE policy follows:

(1) Part 21. The ROA manufacturer/operator should install components, hardware, parts, avionics, and should use manufacturing processes that meet the intent of 14 CFR 21. A compliance statement by the manufacturer/operator should indicate that the ROA meets the design and construction requirements of applicable sections of 14 CFR 21. The manufacturer/operator should use FAA DERs in the areas of structures, powerplant, flight test, systems and equipment, and a DAR to validate that the proposed aircraft meets the requirements of DOE airworthiness interim guidance for ROAs until FAA procedures have been established and approved.

(2) Part 23. See Table 1.

(3) Part 33. It is recommended that DOE require a DER report from the manufacturer/operator stating that the engines meet an acceptable safety standard. This report should include the methods and results of the tests required by the 33.49 endurance test.

(4) Part 35. It is recommended that DOE require a DER (Powerplant/Propeller) report from the manufacturer/operator stating that the propeller(s) meet an acceptable safety standard.

(5) Part 43. Maintenance practices vary greatly with the design and construction of each ROA. Standard aircraft maintenance practices should be followed to the maximum extent possible. Information should be obtained from the manufacturer of the vehicle and should be used as a basis to establish inspection and repair programs. The remote piloted aspect of the ROA make it more difficult to evaluate inflight failures. A sound maintenance program is extremely vital to the safe operation of the ROA.Maintenance and repair of the ROA should follow the guidance in FAR 43.2 through 43.16. Personnel performing maintenance should be certificated in accordance with FAR 65. Maintenance of ground control equipment should be governed by manufacturers recommended inspection and overhaul periods.

(2) Requirements for the ROA total system (aircraft, control van, antennas, etc.) maintenance should be established and should require training prior to

performing any maintenance. This training should be developed and provided by the ROA manufacturer.

(3) The following inspections and procedures should be developed by the manufacturers and accomplished by the ROA operator:

(a) Pre-flight. The manufacturer should develop functional test to be performed prior to ROA dispatch.

(b) Post-flight inspection. These procedures should be developed by the manufacturer and should include functional test of systems following any flight to determine system performance and condition.

(c) Built-in test. Aircraft internal software procedures to determine the level of airworthiness established by predetermined critical system or components should be accomplished after each flight.

(1) Inspections. An inspection procedure should be established which would include a complete inspection of the aircraft within a 12-month period.

(2) Permanent aircraft maintenance records should be established for each ROA (aircraft). These records should contain aircraft total time, engine total time, and propeller total time. Any maintenance, repairs, preventive maintenance, or alterations performed to the aircraft should be entered in this record and signed by the person performing the work.

(6) Part 91. FAR Part 91, "General Operating and Flight Rules," should apply generally to include Subparts A, B, C, D, E and J. Each ROA manufacturer or operator should submit a complete set of operational manuals, checklists, etc., and maintenance procedure manuals, checklists, etc., to the FRRB for approval. In addition, each ROA manufacturer should obtain any waivers to Part 91 through the process in Subpart J, above. Other than operations within Class A airspace, restricted and warning areas will require a chase aircraft (FAA handbook 7610.4H) with direct communication with the controlling source facilities. Important planning and operational considerations are included below:

(a) Mission profiles with specific objectives should be prepared and briefed prior to conducting operations (i.e. training, flight test, engineering support, familiarization, etc.). Standard mission profiles should be developed for regularly scheduled/conducted

flights. Other special mission profiles should be constructed and briefed on a case-by-case basis.

(b) ROAs should avoid flying over populated areas to the maximum extent possible.

(c) FAA Part 91 weather minimums should be complied with for all flight operations. Pilots should maneuver the aircraft to remain clear of clouds during departure, en route, and recovery.

(d) Prior to conducting operational flights in a new location, a frequency request should be submitted and approved, to avoid inadvertent frequency interference and possible loss of aircraft control.

(e) When operating at an airfield with an operating control tower, standard FAA procedures should be observed. A memorandum of agreement should be signed between airfield operations and the operator ensuring applicable procedures will be complied with. Procedures listed in the Airman's Information Manual should be followed.

(f) Contractor Standard Operating Procedures manuals need to address peculiar malfunction/emergency handling of ROAs.

(g) NOTAMS should be used to block airspace and advise others of ROA limitations, etc.

(h) Mission Coordination considerations:

1 Certification of authorization (COA) for flight is required from the FAA for flights outside of airspace designated as restricted or warning areas. (Reference FAA Order 7610.4J, Chapter 12, Section 9)

2 Submission of request to nearest FAA facility for review and determination:

a 60 days in advance of planned operation.

b Define mission requirements (specific).

c Use FAA Form 7711.2 or 7711.1 (Reference FAA Order 7210.3S, Chapter 18, obtain forms from FSDO).

3 Flight notification (flight plan) required for all operations in controlled airspace.

4 Discrete transponder code required for ROA operations.

5 Communications between ROA operator and air traffic facility will be through normal ATC procedures unless advance coordination has been accomplished.

6 Loss of communications will terminate mission:

a ROA operator to ROA.

b ROA operator to ATC.

7 Detailed procedures will be developed to cover real-time emergencies/loss of communications link.

8 Military facilities (ATC) are expected to coordinate with appropriate FAA facility.

9 FAA response (Certificate of Authorization) may contain special provisions (exceptions) for operations.

SUMMARY

The information in Attachment 3 supersedes all previous guidance and places determination of airworthiness requirements with the manufacturer/operator of the ROA in accordance with the requirements in Attachment 3 or under the provisions of 14 CFR 21.17(b). Until FAA guidance in the form of Advisory Circulars and/or regulations is published concerning the certification and operation of ROAs, use of the DOE ROA policy and standards, as detailed in DOE O 440.2A and Attachment 3, represents a rational means to obtain a level of safety for ROAs conducting operations in the National Airspace System.

FAR 23 CHECKLIST

ROA GENERAL TABLE 1

FAR Section and Title	Recommend Compliance	Yes/No	Alternate Data	Comments
Subpart A-General				
23.3 Airplane categories	YES			Informational, defines category differences Normal category definition is useful reference throughout Part 23
Subpart B-Flight General				
23.21 Proof of Compliance	YES			Establishes weight & balance requirements / tolerances for all of subpart B Entire paragraph applicable to ROAs
23.23 Load distribution limits	YES			Establishes requirement for load distribution limits Applies to ROAs
23.25 Weight Limits	YES			Requirement to establish maximum & minimum weights Entire paragraph applicable to ROAs
23.29 Empty weight and corresponding center of gravity	YES			Requirement to establish empty weight and corresponding C.G. Applies to ROAs
23.31 Removable ballast	YES			Allows use of removable ballast during testing Applies to ROAs
23.33 Propeller speed and pitch limits	YES			Requirement to establish propeller speed and pitch limits Appropriate to the type propeller being considered
Performance				
23.45 General	YES			Details atmospheric parameters and engine power requirement to be used when determining aircraft performance Applies to ROAs
23.49 Stalling Speed	YES			Defines VS0 and VS1: Stalling speeds Entire paragraph applicable to ROAs
23.51 Takeoff	YES			Establishes requirement to determine the distance to takeoff and climb to 50’ Applicable to ROAs
23.75 Landing	YES			Establishes requirements to determine landing distances from 50 ft. Applicable to ROAs

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ROA GENERAL TABLE 1

FAR Section and Title	Recommend Compliance	Yes/No	Alternate Data	Comments
23.77 Balked Landing	YES			Establishes balked landing climb requirement. Applicable to ROAs, (Required performance standard)
Flight Characteristics				
23.141 General	YES			Informational, addresses normal operating conditions and pilot capabilities
Subpart C-Structure General				
23.301 Loads	YES			General structural design criteria Applies to ROAs
23.302 Canard or tandem wing configurations	YES			Canard structural requirement Possible ROA application
23.303 Factor of safety	YES			Design requirement Applies to ROAs
23.305 Strength and deformation	YES			Structural requirements Applies to ROAs
23.307 Proof of structure	YES			Structural test requirements Applies to ROAs
Flight Loads				
23.321 General	YES			General compliance requirements Applies to ROAs
23.331 Symmetrical flight conditions	YES			Horizontal tail and wing load requirements Applies to ROAs
23.333 Flight envelope	YES			Requirement for design envelope Applies to ROAs
23.335 Design airspeeds	YES			Requirements for VA, VB, VC and VD Applies to ROAs
23.337 Limit maneuvering load factors	YES			Requirements for + / - n Applies to ROAs
23.341 Gust load factors	YES			Canard Requirements Applies to ROAs
23.345 High lift devices	YES			Flaps design requirements Applies to ROAs

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ROA GENERAL TABLE 1

FAR Section and Title	Recommend Compliance	Yes/No	Alternate Data	Comments
23.347 Unsymmetrical flight conditions	YES			Unbalanced moments requirement Applies to ROAs
23.349 Rolling conditions	YES			Wing loading conditions Applies to ROAs
23.351 Yawing conditions	YES			Vertical surface load requirement Applies to ROAs
23.361 Engine torque	YES			Engine mount design requirements Applies to ROAs
23.363 Side load on engine mount	YES			Engine mount design requirement Applies to ROAs
23.365 Pressurized cabin loads	YES			Pressure vessel design requirement Applies to ROAs
23.367 Unsymmetrical loads due to engine failure	YES			Multi-engine design requirement Applies to ROAs
23.369 Rear lift truss	YES			Special design requirement Applies to ROAs
23.371 Gyroscopic and aerodynamic loads	YES			Turbine engine mount requirements Applies to ROAs
23.373 Speed control devices	YES			Spoiler design requirement Applies to ROAs
Control Surface and System Loads				
23.391 Control surface loads	YES			General requirements Applies to ROAs
23.395 Control system loads	YES			Design requirements Applies to ROAs
23.397 Limit control forces and torques	YES			Control forces limitations ROA application using actuator forces
23.399 Dual control system	NO			Two pilot force limitations Not applicable to ROAs
23.405 Secondary control system	YES			General design requirements ROA application using actuator forces
23.407 Trim tab effects	YES			General design requirements

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ROA GENERAL TABLE 1

FAR Section and Title	Recommend Compliance	Yes/No	Alternate Data	Comments
				ROA application using actuator forces
23.409 Tabs	YES			Design requirements Applies to ROAs
23.415 Ground gust conditions	YES			Control system requirement Applies to ROAs
Horizontal Tail Surfaces				
23.421 Balancing loads	YES			General design requirement Applies to ROAs
23.423 Maneuvering loads	YES			Design requirements Applies to ROAs
23.425 Gust Loads	YES			Design requirements Applies to ROAs
23.427 Unsymmetrical loads	YES			Design requirements Applies to ROAs
Vertical Tail Surfaces				
23.441 Maneuvering loads	YES			Design requirements Applies to ROAs
23.443 Gust loads	YES			Design requirements Applies to ROAs
23.445 Outboard fins	YES			Design requirements Applies to ROAs
Ailerons, Wing Flaps, and Special Devices				
23.455 Ailerons	YES			Design requirements Applies to ROAs
23.457 Wing flaps	YES			Design requirements Applies to ROAs
23.459 Special Devices	YES			Spoiler test requirements Applies to ROAs
Ground Loads				
23.471 General	YES			General design requirements Applies to ROAs
23.473 Ground load conditions and	YES			Design Specifications

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ROA GENERAL TABLE 1

FAR Section and Title	Recommend Compliance	Yes/No	Alternate Data	Comments
assumptions				Applies to ROAs
23.477 Landing gear arrangement	YES			General definitions Applies to ROAs
23.479 Level landing conditions	YES			Design requirements Applies to ROAs
23.481 Tail down landing conditions	YES			Design requirements Applies to ROAs
23.483 One-wheel landing conditions	YES			Design requirements Applies to ROAs
23.485 Side load conditions	YES			Design requirements Applies to ROAs
23.493 Braked roll conditions	YES			Design requirements Applies to ROAs
23.497 Supplementary conditions for tail wheels	YES			Design requirements Possible ROA application
23.499 Supplementary conditions for nose wheels	YES			Design requirements Applies to ROAs
23.505 Supplementary conditions for skiplanes	YES			Special design requirements Possible ROA application
23.507 Jacking loads	YES			Design requirements Applies to ROAs
23.509 Towing loads	YES			Design requirements Applies to ROAs
23.511 Ground load; unsymmetrical loads on multiple wheel units	YES			Design requirements Applies to ROAs
Water Loads				
23.521 Water load conditions	YES			General seaplane / amphibian requirements Possible ROA application
23.523 Design weight and C. G. positions	YES			Water load requirements Possible ROA application
23.525 Application of loads	YES			Seaplane / Amphibian design requirements Possible ROA application

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ROA GENERAL TABLE 1

FAR Section and Title	Recommend Compliance	Yes/No	Alternate Data	Comments
23.527 Hull and main float load factors	YES			Design requirements Possible ROA application
23.529 Hull and main float landing conditions	YES			Design requirements Possible ROA application
23.531 Hull and main float takeoff condition	YES			Design requirements Possible ROA application
23.533 Hull and main float bottom pressures	YES			Design specifications Possible ROA application
23.535 Auxiliary float loads	YES			Design requirements Possible ROA application
23.537 Seawing loads	YES			Design requirements Possible ROA application
Fatigue Evaluation				
23.571 Pressurized Cabin	YES			Evaluation specifications Possible ROA application
23.572 Wing, empennage, and associated structures	YES			Evaluation specifications Applies to ROAs
25.573 Damage tolerance and fatigue evaluation	YES			Evaluation specifications Applies to ROAs
Subpart D-Design and Construction				
23.601 General	YES			General requirements Applies to ROAs
23.603 Materials and workmanship	YES			Specific requirements Applies to ROAs
23.605 Fabrication methods	YES			Specific requirements Applies to ROAs
23.607 Self locking nuts	YES			Specific requirements Applies to ROAs
23.609 Protection of structure	YES			Specific requirements Applies to ROAs
23.611 Accessibility	YES			Specific requirements Applies to ROAs

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ROA GENERAL TABLE 1

FAR Section and Title	Recommend Compliance	Yes/No	Alternate Data	Comments
23.613 Material strength properties and design values	YES			Specific requirements Applies to ROAs
23.619 Special factors	YES			Safety factor requirements Applies to ROAs
23.621 Casting factors	YES			Design requirements Applies to ROAs
23.623 Bearing factors	YES			Design requirements Applies to ROAs
23.625 Fitting factors	YES			Design requirements Applies to ROAs
23.627 Fatigue strength	YES			Design requirements Applies to ROAs
23.629 Flutter	YES			Analytical and test methods Entire paragraph as applies to ROAs
Wings				
23.641 Proof of strength	YES			General requirements Applies to ROAs
Control Surfaces				
23.651 Proof of strength	YES			Test requirements Applies to ROAs
23.655 Installation	YES			Design requirements Applies to ROAs
23.657 Hinges	YES			Design requirements Applies to ROAs
23.659 Mass balance	YES			Design requirements Applies to ROAs
Control Systems				
23.671 General	YES			General requirements Applies to ROAs
23.672 Stability augmentation and automatic systems	YES			Design requirements Applies to ROAs
23.673 Primary flight				Design requirements

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ROA GENERAL TABLE 1

FAR Section and Title	Recommend Compliance	Yes/No	Alternate Data	Comments
controls	YES			Applies to ROAs
23.675 Stops	YES			Design requirements Applies to ROAs
23.677 Trim systems	YES			Design requirements Applies to ROAs
23.679 Control system locks	YES			Design requirements Applies to ROAs
23.681 Limit load static tests	YES			Design requirements Applies to ROAs
23.683 Operation tests	YES			Test requirements Include entire paragraph as applicable to ROAs
23.685 Control system details	YES			Design requirements Applies to ROAs
23.687 Spring devices	YES			Design requirements Applies to ROAs
23.689 Cable systems	YES			Design requirements Applies to ROAs
23.693 Joints	YES			Design requirements Applies to ROAs
23.697 Wing flap controls	YES			Design requirements Apples to ROAs
23.699 Wing flap position indicator	YES			Design requirements Applies to ROAs
23.701 Flap interconnection	YES			Design requirements Applies to ROAs
Landing Gear				
23.723 Shock absorption tests	YES			Test requirements Applies to ROAs
23.725 Limit drop tests	YES			Test requirements Applies to ROAs
23.726 Ground load dynamic tests	YES			Test requirements Applies to ROAs

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ROA GENERAL TABLE 1

FAR Section and Title	Recommend Compliance	Yes/No	Alternate Data	Comments
23.727 Reserve energy absorption drop test	YES			Test requirements Applies to ROAs
23.729 Landing gear extension and retraction system	YES			Design requirements Applies to ROAs
23.731 Wheels	YES			Design requirements Concur - applicable to ROAs
23.733 Tires	YES			Design requirements Include entire paragraph as applicable to ROAs
23.735 Brakes	YES			Design requirements Entire paragraph applies to ROAs
23.737 Skis	YES			Design requirements Possible ROA application
Floats and Hulls				
23.751 Main float buoyancy	YES			Design requirements Possible ROA application
23.753 Main float design	YES			Design requirements Possible ROA application
23.755 Hulls	YES			Design requirements Possible ROA application
23.757 Auxiliary floats	YES			Design requirements Possible ROA application
Personnel and Cargo Accommodations				
23.777 Cockpit controls	YES			Design requirements Applicable to ground station
23.779 Motion and effect of cockpit controls	YES			Design requirements Applicable to ground station
23.781 Cockpit control knob shape	YES			Design requirements Applicable to ground station
Pressurization				
23.841 Pressurized cabins	YES			Design requirements Possible ROA application
23.843 Pressurization tests	YES			Test requirements

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ROA GENERAL TABLE 1

FAR Section and Title	Recommend Compliance	Yes/No	Alternate Data	Comments
				Possible ROA application
23.863 Flammable fluid fire protection	YES			Design requirements Applies to ROAs
23.865 Fire protection of flight controls and other flight structure	YES			Design requirements Applies to ROAs
Lightning Protection				
23.867 Lightning protection of structure	YES			Design requirements Applies to ROAs
Miscellaneous				
23.871 Leveling means	YES			Design requirements Applies to ROAs
Subpart E-Powerplant General				
23.901 Installation	YES			Defines powerplant installation and provides operating and maintenance requirements Entire paragraph applies to ROAs
23.903 Engines	YES			Establishes engine / installation requirements Include entire paragraph as applicable to ROAs
23.904 Automatic Power Reserve System	YES			APR system, if installed, must comply with appendix H of Part 23 Possible ROA application
23.905 Propellers	YES			Introduces propeller requirements Include entire paragraph as applicable to ROAs
23.907 Propeller Vibration	YES			Requires measurement of vibration stresses Include entire paragraph as applicable to ROAs
23.909 Turbocharger Systems	YES			Establishes turbocharger requirements Include entire paragraph as applicable to ROAs
23.925 Propeller Clearance	YES			Establishes clearance requirements Include entire paragraph as applicable to ROAs
23.929 Engine installation	YES			Requires icing protection if icing approval is

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ROA GENERAL TABLE 1

FAR Section and Title	Recommend Compliance	Yes/No	Alternate Data	Comments
ice protection				requested Applies if, icing approval is requested for ROA
23.937 Turbopropeller-drag limiting systems	YES			Addresses system failure requirements Applies, to turboprop ROA's
23.939 Powerplant operating characteristics	YES			Addresses adverse operating characteristics Entire paragraph applies to ROAs
23.943 Negative acceleration	YES			Requires safe operation during negative 'G' flight Applies to ROAs
		Fuel System		
23.951 General	YES			Establishes general system requirements Entire paragraph applies to ROAs
23.953 Fuel system independence	YES			Establishes multi-engine fuel system / tank requirements Applies to ROAs
23.954 Fuel system lightning protection	YES			Requirement to prevent fuel vapor ignition by lightning Applies to ROAs
23.955 Fuel flow	YES			Requirements for different types of fuel systems Entire paragraph applies to ROAs
23.957 Flow between interconnected tanks	YES			Fuel flow requirements between tanks Applies to ROAs
23.959 Unusable fuel supply	YES			Unusable fuel requirement for each tank Applies to ROAs
23.961 Fuel system hot weather operation	YES			Requirement to test for vapor lock Applies to ROAs
23.963 Fuel tanks: general	YES			Includes multiple design requirements Applies to ROAs
23.965 Fuel tank tests	YES			Defines ground test requirements Applies to ROAs
23.967 Fuel tank installation	YES			Defines installation requirements Entire paragraph applies to ROAs
23.969 Fuel tank expansion	YES			Establishes requirement

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ROA GENERAL TABLE 1

FAR Section and Title	Recommend Compliance	Yes/No	Alternate Data	Comments
space				Applies to ROAs
23.971 Fuel tank sump	YES			Details sump requirements Applies to ROAs
23.973 Fuel tank filler connection	YES			Details filler requirements Entire paragraph applies to ROAs
23.975 Fuel tank vents and carburetor vapor vents	YES			Details vent requirements Applies to ROAs
23.977 Fuel tank outlet	YES			Details fuel strainer requirements Entire paragraph applies to ROAs
23.979 Pressure fueling systems	YES			Details system requirements Possible ROA application
Fuel System Components				
23.991 Fuel Pumps	YES			Establishes pump requirements Entire paragraph applies to ROAs
23.993 Fuel system lines and fittings	YES			Establishes requirements Applies to ROAs
23.995 Fuel valves and controls	YES			Establishes requirements Entire paragraph applies to ROAs
23.997 Fuel strainer or filter	YES			Establishes filter requirements Entire paragraph for consistent format
23.999 Fuel system drains	YES			Establishes requirement for drain(s) Applies to ROAs
Oil System				
23.1011 General	YES			Establishes general system requirements Entire paragraph for consistent format
23.1013 Oil tanks	YES			Establishes design and installation requirements Applies to ROAs
23.1015 Oil tank tests	YES			Details testing requirements Applies to ROAs
23.1017 Oil lines and fittings	YES			System requirements for lines and breather lines Applies to ROAs

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ROA GENERAL TABLE 1

FAR Section and Title	Recommend Compliance	Yes/No	Alternate Data	Comments
23.1019 Oil strainer or filter	YES			Requirements for both turbine & reciprocating engines Applies to ROAs
23.1021 Oil system drains	YES			Establishes drain requirement Applies to ROAs
23.1023 Oil radiators	YES			Establishes radiator requirements Possible application to ROAs
23.1027 Propeller feathering system	YES			Addresses systems that use engine oil Possible application to ROAs
Cooling				
23.1041 General	YES			General system requirements Applies to ROAs
23.1043 Cooling tests	YES			Introduces ground & flight test conditions Applies to ROAs
23.1045 Cooling test procedures for turbine engine powered airplanes	YES			Details test conditions Applies to ROAs
23.1047 Cooling test procedures for reciprocating engine powered airplanes	YES			Details test conditions Applies to ROAs
Liquid Cooling				
23.1061 Installation	YES			Details installation requirements Applies to ROAs
23.1063 Coolant tank tests	YES			Details test requirements Applies to ROAs
Induction System				
23.1091 Air induction system	YES			Establishes general system requirements Include entire paragraph as applicable to ROAs
23.1093 Induction system icing protection	YES			Requirement to prevent & eliminate icing Applies to ROAs
23.1101 Induction air preheater design	YES			Specifies design requirements Applies to ROAs
23.1103 Induction system	YES			Details system requirements

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ROA GENERAL TABLE 1

FAR Section and Title	Recommend Compliance	Yes/No	Alternate Data	Comments
ducts				Applies to ROAs
23.1105 Induction system screens	YES			Lists screen requirements Applies to ROAs
23.1107 Induction system filters	YES			Lists filter requirements Applies to ROAs
23.1111 Turbine engine bleed air system	YES			Bleed air system requirements Possible ROA application
Exhaust System				
23.1121 General	YES			Establishes general system requirements Entire paragraph applies to ROAs
23.1123 Exhaust system	YES			Details system requirements Applies to ROAs
23.1125 Exhaust heat exchangers	YES			Details system requirements Entire paragraph Applies to ROAs
Powerplant Controls and Accessories				
23.1141 Powerplant controls: general	YES			Details general requirements Entire paragraph applies to ROAs
23.1143 Engine controls	YES			Details control requirements Entire paragraph applies to ROAs
23.1145 Ignition switches	YES			Details switch requirements Entire paragraph applies to ROAs
23.1147 Mixture controls	YES			Details control requirements Applies to ROAs
23.1149 Propeller speed and pitch controls	YES			Details control requirements Entire paragraph applies to ROAs
23.1153 Propeller feathering controls	YES			Details control requirements Applies to ROAs
23.1157 Carburetor air temperature controls	YES			Requirement for each engine Applies to ROAs
23.1163 Powerplant accessories	YES			Lists accessories requirements Entire paragraph applies to ROAs

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ROA GENERAL TABLE 1

FAR Section and Title	Recommend Compliance	Yes/No	Alternate Data	Comments
23.1165 Engine ignition systems	YES			Details systems requirements Entire paragraph applies to ROAs
Powerplant Fire Protection				
231181 Designated fire zones; regions included	YES			Defines fire zones Applies to ROAs
23.1182 Nacelle areas behind firewalls	YES			Defines environmental temperature requirement Applies to ROAs
23.1183 Lines, fittings, and components	YES			Fire resistant requirements Applies to ROAs
23.1189 Shutoff means	YES			Multi-engine shutoff requirement Possible ROA application
23.1191 Firewalls	YES			Details firewall requirement Applies to ROAs
23.1193 Cowling and nacelle	YES			Lists design requirements Include entire paragraph as applicable to ROAs
23.1203 Fire detector system	YES			Lists system requirements Applies to ROAs
Subpart F-Equipment General				
23.1301 Function and installation	YES			General requirements Entire paragraph applies to ROAs
23.1303 Flight and navigation instruments	YES			Cockpit instrument requirements Entire paragraph applies to ROAs
23.1305 Powerplant instruments	YES			Cockpit instrument requirements Entire paragraph applies to ROAs
23.1307 Miscellaneous equipment	YES			Other equipment requirements Entire paragraph applies to ROA
23.1309 Equipment, systems, and installations	YES			System requirements Applies to ROAs
Instruments: Installation				
23.1311 Electronic display instrument	YES			Electronic instrument requirements

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ROA GENERAL TABLE 1

FAR Section and Title		Recommend Compliance	Yes/No	Alternate Data	Comments
	systems				Applies to ROAs
23.1321	Arrangement and visibility	YES			Instrument requirements Applies to ROAs
23.1322	Warning, caution, and advisory lights	YES			Light requirements Applies to ROAs
23.1323	Airspeed indicating system	YES			System calibration requirements Applies to ROAs
23.1325	Static pressure system	YES			System requirements Applies to ROAs
23.1329	Automatic pilot system	YES			System requirements Applies to ROAs
23.1331	Instruments using a power source	YES			Power failure requirements Applies to ROAs
23.1335	Flight director systems	YES			System requirements Applies to ROAs
23.1337	Powerplant instruments	YES			System requirements Applies to ROAs
		Electrical Systems and Equipment			
23.1351	General	YES			General systems requirements Applies to ROAs
23.1353	Storage battery design and installation	YES			System requirements Applies to ROAs
23.1357	Circuit protective devices	YES			Fuse/circuit breaker requirements Applies to ROAs
23.1361	Master switch arrangement	YES			Electrical system requirements Applies to ROAs
23.1365	Electric cables and equipment	YES			Cable requirements Applies to ROAs
23.1367	Switches	YES			Switch requirements Applies to ROAs
		Lights			
23.1381	Instrument lights	YES			Illumination requirements

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ROA GENERAL TABLE 1

FAR Section and Title		Recommend Compliance	Yes/No	Alternate Data	Comments
					Applies to ROAs
23.1383	Landing lights	YES			Visibility requirements Applies to ROAs
23.1385	Position light system installation	YES			Color requirements Applies to ROAs
23.1387	Position light system dihedral angles	YES			System lighting requirements Applies to ROAs
23.1389	Position light distribution and intensities	YES			Lighting requirements Applies to ROAs
23.1391	Minimum intensities in the horizontal plane of position lights	YES			Intensity specifications Applies to ROAs
23.1393	Minimum intensities in any vertical plane of position lights	YES			Intensity specifications Applies to ROAs
23.1395	Maximum intensities in overlapping beams of position lights	YES			Intensity specifications Applies to ROAs
23.1397	Color specifications	YES			Illumination specifications Applies to ROAs
23.1399	Riding light	YES			Seaplane requirements Possible ROA application
23.1401	Anticollision light system	YES			Required for night operations Applies to ROAs
		Miscellaneous Equipment			
23.1431	Electronic Equipment	YES			EMI/EMF requirements Applies to ROAs
23.1435	Hydraulic systems	YES			Design specifications Applies to ROAs
23.1437	Accessories for multiengine airplanes	YES			Multi-engine requirements Applies to ROAs
23.1438	Pressurization and pneumatic	YES			System requirements

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ROA GENERAL TABLE 1

FAR Section and Title		Recommend Compliance	Yes/No	Alternate Data	Comments
	systems				Possible ROA application
23.1459	Flight recorders	YES			On board recorder requirements Possible ROA application
23.1461	Equipment containing high energy rotors	YES			Rotor failure requirements Possible ROA application
		Subpart G-Operating Limitations and Information			
23.1501	General	YES			Requirement to establish limits and provide information Applies to ROAs
23.1505	Airspeed limitations	YES			Requirement to establish limits Applies to ROAs
23.1507	Operating Maneuvering speed	YES			Requirement to establish limits Applies to ROAs
23.1511	Flap extended speed	YES			Requirement to establish speed Applies to ROAs
23.1513	Minimum control speed	YES			Requirement for multi engine airplanes Applies to ROAs
23.1519	Weight and center of gravity	YES			Requirement to establish limits Applies to ROAs
23.1521	Powerplant limitations	YES			Requirement to establish limits and provide information Applies to ROAs
23.1523	Minimum flight crew	YES			Requirement based on crew workload Applies to ROAs
23.1525	Kinds of operation	YES			Requirement to establish operational environment Applies to ROAs
23.1527	Maximum operating altitude	YES			Requirement to establish limits Applies to ROAs
23.1529	Instructions for Continued Air worthiness	YES			Requirement to prepare instructions Applies to ROAs
		Markings and Placards			
23.1541	General	YES			General requirements Applies to ROAs
23.1543	Instrument	YES			General requirements

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ROA GENERAL TABLE 1

FAR Section and Title		Recommend Compliance	Yes/No	Alternate Data	Comments
	markings: general				Applies to ROAs
23.1545	Airspeed indicator	YES			Specific requirements Applies to ROAs
23.1549	Powerplant and APU instruments	YES			Specific requirements Applies to ROAs
23.1551	Oil quantity indicator	YES			Specific requirements Applies to ROAs
23.1553	Fuel quantity indicator	YES			Specific requirements Applies to ROAs
23.1553	Fuel quantity indicator	YES			Specific requirements Applies to ROAs
23.1555	Control markings	YES			Specific requirements Applies to ROAs
23.1557	Miscellaneous markings and placards	YES			Marking requirements Applies to ROAs
23.1559	Operating limitations placard	YES			Placard requirements Applies to ROAs
23.1563	Airspeed placards	YES			Placard requirements Applies to ROAs
Airplane Flight Manual and Approved Manual Material					
23.1581	General	YES			General manual requirements Applies to ROAs
23.1583	Operating limitations	YES			Specific requirements Applies to ROAs
23.1585	Operating procedures	YES			Procedures requirements Applies to ROAs
23.1587	Performance information	YES			Data requirements Applies to ROAs
23.1589	Loading information	YES			Loading instructions Applies to ROAs

Table 2. Operations

Title 14 CFR Chapter 1 References	Compliance Required	FRRB Controls
Part 91 General Operating and Flight Rules		
Sec. 91.1, Applicability		
Sec. 91.3, Responsibility of PIC		
Sec. 91.11, Interfering with crew		
Sec. 91.13, Careless or reckless operations		
Sec. 91.101, Aircraft within 12 miles of coastline		
Sec. 91.103, Preflight actions		
Sec. 91.105, Flight crew at station		
Sec. 91.111, Operating near other aircraft		
Sec. 91.113, Right of way		
Sec. 91.115, Right of way		
Sec. 91.117, Aircraft speed		
Sec. 91.119, Minimum altitudes		
Sec. 91.121, Altimeter settings		
Sec. 91.123, Compliance with ATC		
Sec. 91.125, Light signals		
Sec. 91.126, Operating in airspace G		
Sec. 91.127, Operating in airspace E		
Sec. 91.129, Operating in airspace D		
Sec. 91.130, Operating in airspace C		
Sec. 91.131, Operating in airspace B		
Sec. 91.135, Operating in airspace A		
Sec. 91.137, Temporary flight restrictions		
Sec. 91.138, Temporary flight restrictions		
Sec. 91.139, Emergency ATC rules		
Sec. 91.141, Flight restrictions near President		
Sec. 91.144, Temp. flight restrictions/high barometer		

Table 2. Operations

Title 14 CFR Chapter 1 References	Compliance Required	FRRB Controls
Part 91 General Operating and Flight Rules, continued		
Sec. 91.151, Fuel-VFR		
Sec. 91.153, VFR flight plan		
Sec. 91.155, VFR weather		
Sec. 91.159, VFR cruise altitudes		
Sec. 91.169, IFR flight plan		
Sec. 91.173, ATC clearance/flight plan required		
Sec. 91.175, Take and landing IFR		
Sec. 91.177, Minimum altitude IFR		
Sec. 91.179, IFR cruise altitude		
Sec. 91.181, Course to be flown/IFR		
Sec. 91.183, IFR commo		
Sec. 91.185, IFR commo failure		
Sec. 91.187, IFR malfunction reports		
Sec. 91.191, Cat II manual		
Part 91.193, Cat II authorization		
Part 91.205, Equipment required		
Part 91.209, Aircraft lights		
Part 91.213, Inop equipment		
Part 91.215, ATC use		
Part 91.217, Data correspondence		
Part 91.219, Altitude alert		
Part 91.221, Traffic alert		
Part 91.303, Aerobatic flight		
Part 91.305, Flight test areas		