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NASA Procedural Requirements

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COMPLIANCE IS MANDATORY

Aircraft Operations Management Manual

Responsible Office: Aircraft Management Division

Table of Contents

Preface

- P.1 Purpose
- P.2 Applicability
- P.3 Authority
- P.4 Applicable Documents
- P.5 Measurements/Verification
- P.6 Cancellation

Chapter 1. Flight Operations, General Overview

- 1.1 Concept of Operations
- 1.2 Assignment of Authority and Responsibility
- 1.3 Operational Use
- 1.4 International Aircraft Operations
- 1.5 Special Operational Requirements
- 1.6 Waivers

Chapter 2. Airworthiness and Maintenance

- 2.1 Purpose
- 2.2 Airworthiness General Requirements
- 2.3 Airworthiness Responsibilities
- 2.4 Airworthiness, Flight Readiness, and Safety Reviews
- 2.5 Staffing for Airworthiness Review Process
- 2.6 Maintenance Program

Chapter 3. Research and Program Support Operations

- 3.1 Operations
- 3.2 Assignment of Pilot in Command of NASA Aircraft
- 3.3 Documentation
- 3.4 Flightcrew Requirements and Currency
- 3.5 Ground Training
- 3.6 Readiness Reviews

Chapter 4. Mission Management Flight Operations

- 4.1 Purpose
- 4.2 Policy
- 4.3 Classification of Mission Management Flights
- 4.4 Approval of Flights
- 4.5 Responsibilities Associated with Mission Management Flight Operations
- 4.6 Reporting Requirements
- 4.7 Reimbursement for Nonofficial Travel Use
- 4.8 Operations
- 4.9 Use of NASA Aircraft for Mission Management Flight Purposes
- 4.10 Waivers and Supplements
- 4.11 Flightcrew Qualifications
- 4.12 Crewmember Training
- 4.13 Ground Training
- 4.14 Flight Training Phase
- 4.15 Overdue Training
- 4.16 Minimum Currency Requirements
- 4.17 Overdue Recent Experience
- 4.18 Evaluation Phase
- 4.19 Coordination and Scheduling
- 4.20 Crew Complement
- 4.21 Crew Duty Time
- 4.22 Crew Rest
- 4.23 Maximum Flight Time Limitations
- 4.24 Hazardous Cargo
- 4.25 Sterile Cockpit Procedures
- 4.26 Crew Briefings
- 4.27 Flight Planning Considerations
- 4.28 Takeoff and Departure Procedures
- 4.29 En Route Procedures
- 4.30 Arrival, Approach, and Landing Procedures
- 4.31 Post-flight Procedures
- 4.32 Specific Operational Restrictions

Chapter 5. Unmanned Aircraft Systems Operations

- 5.1 General
- 5.2 Planning
- 5.3 Preflight Operations
- 5.4 Flight Operations
- 5.5 Flight Crew Requirements
- 5.6 Airworthiness and Flight Safety Reviews

Chapter 6. Aviation Safety

- 6.1 Introduction
- 6.2 Aviation Safety Roles and Responsibilities
- 6.3 Center's Aviation Safety Program
- 6.4 Pre-Mishap Plan/Aircraft Incident Response Plan

Chapter 7. Aviation Medical Program

- 7.1 Introduction
- 7.2 Primary Aircrew Medical Requirements
- 7.3 Flight Physical Records
- 7.4 Review Boards
- 7.5 Waivers

Chapter 8. Aircraft Acquisitions and Dispositions

- 8.1 General
- 8.2 Aircraft Acquisition
- 8.3 Aircraft Materiel Acquisition Procedures
- 8.4 Aircraft Disposition
- 8.5 Aircraft Inventory

Chapter 9. Inter-Center Aircraft Operations Review Program

- 9.1 Purpose
- 9.2 Responsibilities
- 9.3 Procedures

Chapter 10.

Chapter 11. Flight Operations Performance Measurements and Reporting

- 11.1 Purpose
- 11.2 Responsibilities
- 11.3 Aircraft Data Reporting Requirements

Chapter 12. Assignment and Removal from Flight Status

- 12.1 Purpose
- 12.2 Assignment Procedures
- 12.3 Removal Procedures

Chapter 13. NASA Airfield Operations

- 13.1 General Requirements
- 13.2 Contents of Airfield Operations Manual
- 13.3 Safety and Emergency Requirements
- 13.4 Wildlife Hazard Management
- 13.5 Noncomplying Conditions
- 13.6 Deviations

Appendix A. Definitions

Appendix B. Acronyms

Appendix C. Flight on Public Aircraft

C-1 Flying on Public Aircraft (Crewmembers and Qualified Non-Crewmembers) C-2 Flying on Public Aircraft (Passengers)

Appendix D. Inter-Center Aircraft Operations Review Plan

Appendix E. NASA Inter-Center Aircraft Operations Program Review Sheet

Appendix F. Certificate of Airworthiness for Aircraft

Appendix G. NASA Aircraft Cost and Performance Worksheets

- G-1 NASA Aircraft Cost and Performance Worksheets
- G-2 NASA Aircraft Cost and Performance Worksheets
- G-3 NASA Aircraft Cost and Performance Worksheets
- G-4 NASA Aircraft Cost and Performance Worksheets
- G-5 NASA Aircraft Cost and Performance Worksheets

Appendix H. Sample Approval Request to Acquire/Transfer/Dispose of Aircraft

Appendix I. UAS Classification Matrix

Appendix J. UAS Pilot Matrix

Appendix K. Compliance Matrix

List of Tables

- Table 4-1 Mission Requirements
- Table 4-2 Minimum Currency Requirements for Pilots
- Table 4-3 Maximum Flight Time Limitations
- Table 4-4 Minimum Runway Length for Mission Management Operations
- Table 4-5 Wind Restrictions
- Table 4-6 Minimum Landing Fuel
- Table 13-1 Wildlife Hazard Assessment

List of Figures

- Figure 4-1 Mission Required Travel Where Passenger Transportation Is the Primary Purpose of the Flight
- Figure 4-2 Mission Required Travel Where Passenger Transportation Is Not the Primary Purpose of the Flight
- Figure 4-3 Approval Flow for Other Official Travel Without Senior Federal Officials, Families of Such Senior Federal Officials, or Non-Federal Travelers Aboard
- Figure 4-4 Approval Flow for Other Official Travel With Senior Federal Officials, Families of Such Senior Federal Officials, or Non-Federal Travelers Aboard

Preface

P.1 Purpose

This NASA Procedural Requirements (NPR) establishes requirements, responsibilities, and procedures that will assist NASA Centers and other locations operating NASA aircraft to create local policies and procedures for the management of NASA aircraft resources, flight operations, and related matters. This NPR provides a standard approach for the management and use of the NASA Aircraft Operations program. The purpose of the NASA Aircraft Operations program is to directly support the Agency's mission in aeronautical research and development, space science and applications, space flight, astronaut readiness training, and related activities by providing operational flights in both manned aircraft and unmanned aircraft systems (UASs). This NPR should be used in conjunction with other governing instructions, handbooks, and manuals.

P.2 Applicability

This NPR is applicable to NASA Headquarters (HQ) and NASA Centers, including Component Facilities and Technical and Service Support Centers, and contractors operating NASA aircraft/UASs. This NPR applies to the Jet Propulsion Laboratory (JPL), other contractors, or grant recipients only to the extent specified or referenced in the appropriate contracts, grants, or agreements.

A requirement in this NPR is identified by “shall,” a good practice by “should,” permission by “may” or “can,” expected outcome or action by “will,” and descriptive material by “is” or “are” (or another verb form of “to be”). All requirements are numbered consecutively in brackets at the end of the applicable sentence. Requirements are compiled as a Compliance Matrix in Appendix K.

Note: This NPR alone is not sufficient to stipulate requirements for the contractor or grant recipient. The contract, grant, or agreement must state the requirements(s) from NPR 7900.4 and this NPR.

P.3 Authority

- a. The National Aeronautics and Space Act of 1958, as amended, § 203(c)(1), 42 U.S.C. § 2473(a)(1 and 2), (c)(1).
- b. National Aeronautics and Space Administration; 14 C.F.R. § 1201.102, Functions.

P.4 Applicable Documents

- a. 5 U.S.C., Chapter 53, Pay Rates and Systems.
- b. 10 U.S.C., § 2648, Persons and Supplies: Transportation.
- c. 49 U.S.C. § 40102, Definitions.
- d. Public Law 106-181, Wendell H. Ford Aviation Investment and Reform Act for the 21st Century.
- e. 7 C.F.R. Chapter III, Animal and Plant Health Inspection Service.
- f. 9 C.F.R. Chapter I, Animal and Plant Health Inspection Service, United States Department of

Agriculture (USDA).

- g. 14 C.F.R. § 21, Certification Procedures for Products and Parts.
- h. 14 C.F.R. § 39, Airworthiness Directives.
- i. 14 C.F.R. § 43, Maintenance, Preventative Maintenance, Rebuilding, and Alteration.
- j. 14 C.F.R. § 61, Certification: Pilots, Flight Instructors, and Ground Instructors.
- k. 14 C.F.R., § 65 Certification: Airmen Other Than Flight Crewmembers.
- l. 14 C.F.R. § 91, General Operating and Flight Rules.
- m. 14 C.F.R. § 91.203, Civil Aircraft: Certifications Required, Subparts (a) and (b).
- n. 14 C.F.R. § 139, Certification of Airports.
- o. 14 C.F.R. § 142, Training Centers.
- p. 40 C.F.R. § 260, Hazardous Waste Management System: General.
- q. 40 C.F.R. § 261, Identification and Listing of Hazardous Waste.
- r. 40 C.F.R. § 262, Standards Applicable to Generators of Hazardous Waste.
- s. 40 C.F.R. § 263, Standards Applicable to Transporters of Hazardous Waste.
- t. 40 C.F.R. § 264, Standards for Owners and Operators of Hazardous Waste Treatment Storage and Disposal Facilities.
- u. 40 C.F.R. § 265, Interim Status Standards for Owners and Operators of Hazardous Waste Treatment Storage and Disposal Facilities.
- v. 41 C.F.R. § 101-37, Government Aviation Administration and Coordination.
- w. 41 C.F.R. § 102–2, Federal Management Regulation System.
- x. 41 C.F.R. § 102-33, Management of Government Aircraft.
- y. 41 C.F.R. § 102-39, Replacement of Personal Property Pursuant to the Exchange/Sale.
- z. 41 C.F.R. § 105.5, Definitions.
- aa. 41 C.F.R. § 300, Federal Travel Regulation System—General.
- bb. 41 C.F.R. § 301, Temporary Duty (TDY) Travel Allowance.
- cc. 49 C.F.R. § 175, Carriage by Aircraft.
- dd. OMB Circular A-11 (revised), Preparation, Submission, and Execution of the Budget, June 30, 2006.
- ee. OMB Circular A-76 (revised), Performance of Commercial Activities, May 29, 2003.
- ff. OMB Circular A-126 (revised), Improving the Management and Use of Government Aircraft, May 22, 1992.
- gg. NPD 1000.3, The NASA Organization.
- hh. NPD 4300.1, NASA Personal Property Disposal Policy.

- ii. NPD 7900.4, NASA Aircraft Operations Management.
- jj. NPR 1441.1, NASA Records Retention Schedules.
- kk. NPR 4100.1, NASA Materials Inventory Management Manual.
- ll. NPR 4200.1, NASA Equipment Management Procedural Requirements.
- mm. NPR 4300.1, NASA Personal Property Disposal Procedural Requirements.
- nn. NPR 4310.1, Identification and Disposition of NASA Artifacts.
- oo. NPR 8000.4, Agency Risk Management Procedural Requirements.
- pp. NPR 8621.1, NASA Procedural Requirements for Mishap and Close Call Reporting, Investigating, and Recordkeeping.
- qq. NPR 8715.1, NASA Occupational Safety and Health Programs.
- rr. NPR 8715.3, NASA General Safety Program Requirements.
- ss. NPR 8715.5, Range Safety Program.
- tt. NPR 9020.1, Definitions of Financial Management Terms.
- uu. NASA STD 8719.11, Safety Standard for Fire Protection.
- vv. NASA STD 8719.12, Safety Standard for Explosives, Propellants and Pyrotechnics.
- ww. NPR/NPD 9353-6 (RCS-10-0000-00271).
- xx. FAA Advisory Circular 20-142, CHG1, Eligibility and Evaluation of U.S. Military Surplus Flight Safety Critical Aircraft Parts, Engines, and Propellers.

P.5 Measurements/Verification

- a. Does the HQ Aircraft Division fulfill its responsibilities as specified within this NPR? To determine the compliance of the HQ Aircraft Division (AD) with the requirements contained in this NPR, internal and external auditors responsible for verifying HQ requirements and processes evaluate the HQ AD's performance against the requirements contained within this NPR.
- b. Are Centers following the content and process requirements of this NPR that are applicable to Centers for Center aircraft operations and commercial aircraft services in accordance with this NPR? To determine Center compliance with this NPR, Center Directors or designees determine and document compliance by applying a verification process that is tailored to meet the needs of the Center. The HQ AD, with the support of the Inter-Center Aircraft Operations Panel (IAOP), conducts biennial reviews of the Centers and spot checks to review Center documentation and implementation of Center-specific aircraft operations and commercial aircraft services activity.

P.6 Cancellation

NPR 7900.3B, Aircraft Operations Management, June 12, 2007; NM 7900-65, NASA Interim Directive (NID) for NPR 7900.3B, NASA Aircraft Operations Management, September 24, 2009; and NM 7900.83, NASA Interim Directive (NID): Unmanned Aircraft System (UAS) Policy Update, November 10, 2009.

/S/ Dr. Woodrow Whitlow, Jr. Associate Administrator Mission Support Directorate

Chapter 1. Flight Operations, General Overview

1.1 Concept of Operations

1.1.1 Where practical, NASA seeks to use aircraft/UAS that can support multiple mission requirements.

1.1.2 NASA uses its aircraft/UAS resources in an effective and efficient manner to conduct and support missions, approved/planned programs, and projects.

1.1.3 NASA maintains the level of airworthiness and aircraft/UAS operating standards that will ensure the safe operation of aircraft/UAS missions.

1.1.4 NASA controlled aircraft are subject to Federal Aviation Regulations with respect to the use of airspace, the control of air traffic, and aircraft registration. Aircraft on loan from the U.S. Armed Forces are not subject to civil registration. NASA aircraft pilots shall secure diplomatic clearance approval prior to entry into the airspace of a foreign country, except for brief use of foreign airspace adjoining the United States, as directed by air traffic control (ATC). [1]

1.1.5 NASA aircraft shall be operated in accordance with applicable provisions of the Federal Aviation Administration's (FAA) Federal Aviation Regulations (14 C.F.R., Aeronautics and Space) except:

a. Where this directive prescribes more stringent requirements.

b. Where deviations from the FAA regulations have been approved by the FAA, a Center airworthiness/flight readiness review board, or NASA policy. [2]

1.1.6 For each Center operating aircraft/UASs or procuring aircraft/UAS services, the Center Director shall maintain a program-independent Flight Operations Office, the specific purpose of which will be to plan, organize, direct, and control the operations, maintenance, modification, safety, and support of all Center-assigned or -contracted aircraft. [3]

1.1.6.1 The head of this office is responsible for all Center-assigned or -contracted aircraft. The head of this office shall be the senior line manager who is responsible for aviation activities at the Center. [4]

1.1.6.2 The Center Director shall assign the head of the Flight Operations Office the authority and responsibility and provide the resources necessary to manage and conduct safe, effective, and efficient operations in accordance with NASA directives, guidance, and other applicable Federal regulations. [5]

1.1.6.3 Prior to contract award, the head of the Flight Operations Office shall review and concur upon any Center contract or agreement that includes aviation operations. [6]

1.1.6.4 If a Center does not have a Flight Operations Department, the Center Director shall have another Center's Flight Operations Department review and concur on such contracts or agreements for them each time they procure aviation services. [7]

1.2 Assignment of Authority and Responsibility

1.2.1 The Assistant Administrator for the Office of Strategic Infrastructure shall designate aircraft classifications and assign aircraft to the appropriate Center after consultation with the affected Mission Directorates and Center Directors. [8]

1.2.1.1 Records created throughout flight operations management shall be maintained, managed, and disposed of by each Center's Flight Operations Office or designated office in accordance with NPR 1441.1, NASA Records Retention Schedules. [9]

1.2.2 Mission Directorate Associate Administrators shall:

1.2.2.1 Coordinate early with the Office of Strategic Infrastructure to establish program or project plans involving the requirement for acquisition or use of aircraft, including UASs. [10]

1.2.2.2 Comply with OMB Circulars A-76, Performance of Commercial Activities, and A-126, Improving the Management and Use of Government Aircraft, as they apply to the acquisition of aircraft/UASs and coordinate related documentation requirements with the Assistant Administrator for the Office of Strategic Infrastructure. [11]

1.2.2.3 Annually review aircraft mission and program requirements, use, and associated costs, and project those requirements and costs over 5 years in an annual report to the HQ AD not later than September 30 of each year. [12]

1.2.2.4 Submit Exhibit 300 of OMB Circular A-11, Preparation, Submission, and Execution of the Budget, for aircraft and aircraft programs funded by their Directorate. These submissions shall be coordinated with the Office of Strategic Infrastructure and the Office of the Chief Financial Officer. [13]

1.2.3 Center Directors shall be responsible for: a. The airworthiness and flight safety of assigned aircraft, including UASs. [14]

b. Coordination with the Office of Strategic Infrastructure in establishing program or project plans involving the requirement, assignment, and operation of aircraft/UASs. [15]

c. Annually reviewing aircraft mission and program requirements (for those programs controlled/funded by their respective Center), use, and associated costs and for projecting those requirements and costs over 5 years in an annual report to the HQ AD not later than September 30 of each year. [16]

d. Ensuring compliance with the Financial Management Requirements (FMR) in the appropriate use and application of function codes that are used to account for, track, and report aircraft costs. [17]

e. Quarterly reporting of aircraft operations and costs to Headquarters, as stipulated in Chapter 11, and specific passenger transportation reporting requirements detailed in Chapter 4. [18]

f. Ensuring compliance with 41 C.F.R. §102-33, Management of Government Aircraft; 41 C.F.R. § 300, Federal Travel Regulation System—General; 41 C.F.R. § 301, Temporary Duty (TDY) Travel Allowance; and OMB Circular A-126, Improving the Management and Use of Government Aircraft. [19]

g. The budget for personnel and travel in support of the Inter-Center Aircraft Operations Panel (IAOP). [20]

h. Approving aircraft charters or leases for periods of 30 days or less with 7 days prior notice to the HQ AD. [21]

- i. The technical assessment, cost evaluation, acquisition, use, and disposition of all aircraft/UASs under their control. This includes acquisition of aircraft/UASs used solely in wind tunnels or other nonflyable test models. [22]
- j. Coordinating and submitting all aircraft acquisition and disposition proposals to the Assistant Administrator for the Office of Strategic Infrastructure for approval. [23]
- k. Reporting all acquisition and disposal actions to the HQ AD to comply with Federal aircraft data reporting requirements. [24]
- l. Ensuring that Center managers who acquire aircraft/UAS or aviation services coordinate those acquisitions with the Center's Flight Operations Department to ensure compliance with the NASA's Aviation Safety Program and aircraft management policies. [25] If the Center does not have an aircraft management office, prior coordination will be conducted with the HQ AD.

1.2.4 Program/project managers shall:

- a. Coordinate early with the Office of Strategic Infrastructure to establish program or project plans involving the requirement for acquisition or use of aircraft, including UASs. [26]
- b. Prepare a Business Case Analysis (BCA) in accordance with OMB Circulars A-11, A-76, and A-126 prior to the acquisition of aircraft/UASs and gain approval of the BCA by the cognizant Mission Directorate Associate Administrator and the Assistant Administrator for the Office of Strategic Infrastructure. [27]
- c. Annually review aircraft mission and program requirements, use, and associated costs, and project those requirements and costs over 5 years to support their Mission Directorate's annual report to the HQ AD, not later than September 30 of each year. [28]
- d. Submit OMB Circular A-11, Exhibit 300, as appropriate, for aircraft and aircraft programs funded by their Directorate. These submissions shall be coordinated with the appropriate Mission Directorate, the Office of Strategic Infrastructure, and the Office of the Chief Financial Officer. [29]

1.2.5 Center's Chief of Flight Operations

1.2.5.1 The Center's Chief of Flight Operations is the senior line manager with authority over flight activities operated or controlled by the Center and is directly responsible to the Center Director for the safe and effective conduct of those activities. The Center's Chief of Flight Operations shall hold the following qualifications for assignment to this position:

- a. A minimum of 10 years of relevant aviation-related experience, supervisory or managerial experience in aircraft operations similar to the primary aircraft type operated at the Center, and a high level of familiarity with the organization's aircraft operations. [30]
- b. Current or previously held qualifications as a NASA Pilot in Command (PIC), a military rating as an Aircraft Commander, or a FAA Airline Transport Pilot (ATP) certificate. [31]

1.2.5.2 The Center's Chief of Flight Operations is authorized to fly Center aircraft.

1.2.5.3 The Center's Chief of Flight Operations shall perform the following duties:

- a. Ensure the effective management of flight operations under that Center's cognizance, per NPD 7900.4, NASA Aircraft Operations Management. [32]
- b. Authorize personnel to operate and maintain aircraft under NASA's control. [33] The Center Flight Operations Office has the final operational flight release authority for any NASA aircraft operating from or under the cognizance of that Center.

- c. Determine the number of aircraft types in which an individual crewmember may maintain qualification at any given time and annually review that determination. [34]
- d. Recommend assignment of the Center Aviation Safety Officer (ASO), with the concurrence of the Center Chief, Safety and Mission Assurance, to the Center Director for approval. [35]
- e. Fly as a crewmember or observer on all assigned aircraft, where practicable and as necessary, to observe performance of assigned flightcrews. [36]

1.2.6 Center Aviation Safety Officers

- 1.2.6.1 The ASO shall manage the Center's aviation safety program as described in Chapter 6. [37]
- 1.2.6.2 The ASO shall be a civil servant assigned to the Flight Operations Department, serve as the Center's focal point for aviation safety, and act on behalf of the Center Director when discharging this responsibility. [38] The ASO will advise the Chief of Flight Operations regarding safety issues/concerns within the organization. Managers may use the advice of the ASO in formulating organizational decisions, but will not expect or rely on the ASO to make managerial decisions.
- 1.2.6.3 If a safety concern has not been dealt with sufficiently by the Flight Operations organization, the ASO may take the concern directly to the Center Director. In addition, the ASO may take the concern to the Chief, Safety and Mission Assurance or the Assistant Administrator for the Office of Strategic Infrastructure.

1.2.6.4 The ASO will meet NASA PIC qualifications and the requirements in paragraph 6.2.9.

1.2.7 Chief Pilot

1.2.7.1 To qualify for assignment, the Chief Pilot shall:

- a. Hold and maintain qualification as a NASA PIC. [39]
- b. Have at least 3 years experience within the past 6 years as PIC of an aircraft similar in category and class to at least one of the aircraft used in the types of operations being conducted at the Center. [40]
- c. Demonstrate satisfactory supervisory and managerial capabilities. [41]

1.2.7.2 Specific duties will be defined at the respective NASA Center.

1.2.8 A Chief of Maintenance shall be assigned to the Flight Operations Department and serve as the Chief of Flight Operations' focal point for all aircraft maintenance activities. [42]

1.2.8.1 To qualify for assignment, the Chief of Maintenance shall:

- a. Have had at least 3 years of experience within the past 6 years in aircraft maintenance in a similar-size operation maintaining aircraft similar to those used by the Center, with management experience such as supervisor or lead in aircraft maintenance. [43]
- b. Have held an FAA Airframe and Power Plant (A&P) Certification, have held an equivalent military designation, or demonstrate an equivalent level of qualifications and expertise. [44]

1.2.8.2 Duties will be defined at NASA Centers.

1.2.9 Chief of Quality Assurance

1.2.9.1 To qualify for assignment, the Chief of Quality Assurance shall:

- a. Hold a current FAA Inspection Authorization Certificate or have held an equivalent military designation, or demonstrate an equivalent level of qualifications and expertise. [45]
- b. Maintain a level of inspection expertise and activity needed to meet FAA Inspection Authorization Certificate renewal requirements or the military equivalent. [46]
- c. Have had at least 3 years of maintenance experience within the last 6 years, 1 year of which must have been as a maintenance inspector. [47]
- d. Have at least 1 year of experience in a supervisory capacity. [48]

1.2.9.2 Duties will be defined at NASA Centers.

1.2.10 The IAOP shall:

- a. Advise the Assistant Administrator for the Office of Strategic Infrastructure regarding operational, management, and safety policies for NASA aircraft. [49]
- b. Conduct periodic meetings with the HQ AD to review policies and procedures related to aircraft/UAS operational matters affecting all Centers and to make recommendations to the AD regarding policies, procedures, and guidelines that may be applicable to all Centers. [50]
- c. Conduct reviews of a special nature at the request of the Assistant Administrator for the Office of Strategic Infrastructure and conduct periodic reviews of all aspects of flight operations at NASA Centers, including compliance with applicable Federal regulations and Headquarters and Center policies and procedures. [51]

1.2.11 The HQ AD shall:

- a. Coordinate the formulation of Agency-wide policies, procedures, and guidelines concerning aircraft/UAS operation and ensure their effective and efficient communication to Centers and appropriate Headquarters offices. [52]
- b. Advise and assist the Assistant Administrator for the Office of Strategic Infrastructure, the Mission Directorates, and the Center Directors concerning the acquisition/disposition process. [53]
- c. Advise the Assistant Administrator for the Office of Strategic Infrastructure regarding the establishment of policy for the use of NASA aircraft/UASs. [54]
- d. Coordinate the findings and recommendations of IAOP reviews dealing with institutional management issues with the appropriate institutional Associate Administrator. [55]
- e. Maintain liaison with other Government agencies and the private sector on matters pertaining to flight operations, maintenance, and management practices common to all Centers. [56]
- f. Provide coordination and other assistance in the assignment of IAOP teams as they review and evaluate the adequacy of Center organizations, facilities, and procedures for flight operations. [57]
- g. Provide inter-Center and interagency coordination for logistics support to Centers, as necessary. [58]
- h. Collect, collate, and report Agency aircraft data (e.g., Federal Aviation Interactive Reporting System (FAIRS) data) to other Federal agencies. [59]

1.2.12 The Chief, Safety and Mission Assurance shall provide leadership, policy direction, functional oversight, assessment, standards, and coordination for safety and mission assurance affecting NASA's aviation operations. [60]

1.3 Operational Use

1.3.1 NASA's aircraft are generally used for research and development, program support, and passenger transportation, and many NASA aircraft fly multiple missions. NASA maintains only the number of aircraft to enable the Agency to meet its mission requirements that are linked to the Strategic Plan.

1.3.2 NASA's aircraft perform missions that include, but are not limited to:

- a. Research and Development (R&D). R&D operations are a means for NASA's Mission Directorates to conduct research at various altitudes and atmospheric conditions. R&D operations are flown to advance aeronautics research, to expand human knowledge of Earth and space science, and to support the Vision for Space Exploration.
- b. Program Support (PS). PS operations enable the accomplishment of NASA's program objectives. Such use includes, but is not limited to, astronaut training, safety chase, photo chase, cargo transport, flightcrew training, range surveillance, launch security, launch and landing weather reconnaissance, contingency support, and command and control.
- c. Passenger Transportation. Use of NASA aircraft for passenger transportation allows NASA personnel to meet mission-required travel needs, as defined in OMB Circular A 126 and this NPR. Passenger transportation flights (referred to as mission management flights throughout this NPR) may be classified as "Mission Required" only when failure to use a NASA aircraft would have a clear, negative impact on a NASA operational mission, prevent timely response to an aircraft or spacecraft accident, or threaten the health and safety of NASA personnel, and only when such travel could not be conducted using commercial airlines, charter aircraft service, or ground transportation to fulfill that mission need.

1.4 International Aircraft Operations

1.4.1 All flight crews conducting international, reduced vertical separation minimum (RVSM), minimum navigation performance specifications (MNPS), random area navigation (RNAV), or required navigation performance (RNP) shall complete (as appropriate to the operation) airspace operations training and shall be authorized to operate in such airspace in accordance with the FAA regulations (14 C.F.R., Aeronautics and Space). [61]

1.4.2 While conducting operations in foreign countries or international airspace, all NASA flights will be conducted as state aircraft under a diplomatic clearance. Center Flight Operations shall utilize DOD 4500.54-M (DoD Foreign Clearance Guide) and DoD Flight Information Publications for proper international operations coordination. [62]

1.4.3 The Center Director shall be responsible for identifying and complying with all national and local environmental laws and requirements for the proper handling and disposal of international garbage on NASA aircraft. [63] Each Center will have a documented procedure for handling international garbage on NASA aircraft. In accordance with 7 C.F.R. Chapter III and 9 C.F.R. Chapter I, the Animal Health Protection Act (AHPA) and the Plant Protection Act, the United States Department of Agriculture's (USDA) Animal and Plant Health Inspection Service (APHIS) has the authority to regulate the handling and movement of certain foreign waste products to prevent the spread of foreign plant pests and livestock or poultry diseases. This waste is typically referred to as "regulated garbage." Violations to either of these two laws are potentially punishable by both prison time and fines.

1.5 Special Operational Requirements

1.5.1 Each NASA aircraft shall be operated in accordance with an aircraft manual providing standard operating procedures. [64] These manuals (or checklists) shall be accessed electronically or carried onboard all NASA aircraft. [65] For UAS, manuals shall be immediately accessible to the pilots. [66]

1.5.2 All NASA Flight Operations flight planning libraries shall have available the necessary Flight Information Publications for U.S. and international operations. [67]

1.5.3 Each Center shall have a program for their aircrews to maintain a level of proficiency that will ensure their ability to safely operate an aircraft within governing regulations to include abnormal and emergency situations. [68] Each Center shall establish and maintain a training program using check flights to assess its adequacy and ensure that personnel are competent to perform their assigned duties. [69]

1.6 Waivers

1.6.1 When deviations from this NPR are necessary, Center Directors or Associate Administrators shall submit requests for waivers to the Assistant Administrator for the Office of Strategic Infrastructure via HQ AD. [70]

1.6.1.1 Prior written approval from the Assistant Administrator for the Office of Strategic Infrastructure shall be obtained before implementing procedures that are less restrictive than those contained in this NPR. [71]

1.6.2 Only the Administrator or Assistant Administrator for the Office of Strategic Infrastructure, who is responsible for this NPR, or delegated authority may waive requirements contained in this NPR.

1.6.3 A waiver may be approved only if it meets all of the following criteria:

- a. It is not prohibited by Federal policy.
- b. It would not present an undue risk to public health, safety, the environment, or personnel.
- c. It is justified under the particular circumstances.

1.6.4 The waiver approval authority shall approve waivers only for a specific event, period, or duration and shall specify the boundaries of the requirements being waived. [72]

1.6.5 The waiver approval authority shall notify all who have current waivers against this NPR when this NPR is updated and request verification of continued validity. [73]

1.6.6 NASA officials who request waivers shall document the following in the request for waiver:

- a. Identification of the directive and specific requirement(s) for which the waiver is requested.
- b. Scope (e.g., site, facility, operation, or activity) and duration of the waiver request.
- c. Justification for the waiver, including:
 - (1) Purpose/rationale for requesting the waiver.
 - (2) Whether application of the requirement in the particular circumstances would conflict with

another requirement.

(3) Whether application of the requirement in the particular circumstances would not achieve, or is not necessary to achieve, the underlying purpose of the requirement.

(4) Any other pertinent data or information related to the waiver request (e.g., cost or schedule considerations).

(5) Identification and justification of the acceptance of any additional risk that will be incurred if the waiver is granted.

(6) A description of any special circumstances that warrant granting the waiver, including whether:

a. Application of the requirement in the particular circumstances would not be justified by any safety and health reason.

b. The waiver would result in a health and safety improvement that compensates for any detriment that would result from granting the waiver.

c. There exists any other material circumstances that were not considered when the requirement was adopted, for which it is in the public interest to grant a waiver.

(7) A description of any alternative or mitigating action that will be taken to ensure adequate safety and health and protection of the public, the workers, and the environment for the effective period of the waiver. [74]

Chapter 2. Airworthiness and Maintenance

2.1 Purpose

2.1.1 This chapter establishes policy to ensure the airworthiness and maintenance of NASA aircraft/UASs that use aerodynamic lift for flight, operate in the Earth's atmosphere where aeronautical flight can occur, and are used to perform NASA missions. It also establishes policy for safety and flight readiness reviews performed in conjunction with the acceptance or modification of aircraft.

2.2 Airworthiness General Requirements

2.2.1 NASA aircraft shall be operated in an airworthy condition as certified by a formal NASA airworthiness review board (ARB), under the authority of a NASA Center Director, using a NASA Certificate of Airworthiness process. [75]

2.2.1.1 All NASA aircraft shall possess and maintain a NASA Certificate of Airworthiness (Appendix F) approved by the Center Director. [76] For all NASA aircraft other than NASA-owned aircraft, the certificate shall state the duration of applicability, as well as any limitations of that certificate. [77] A NASA Certificate of Airworthiness is valid only when conducting a NASA mission.

2.2.1.2 All aircraft used for passenger transportation purposes shall possess a "Normal" or "Transport" category FAA Certificate of Airworthiness. [78]

2.2.1.3 When NASA aircraft are transferred between Centers, a new NASA Certificate of Airworthiness approved by the receiving Center Director shall be obtained prior to commencing flight. [79]

2.2.2 Airworthiness, flight safety, and mission readiness reviews, including configuration control, shall be conducted for all aircraft modifications, with the exception of those noted in section 2.4.2.4 that are cleared through an airworthiness review process (ARP) or configuration control process. [80] These review processes are to clear unique or nonstandard internal or external payloads or stores configurations for flight and to review nonstandard flight operations—those other than normal aircraft operations for the specific aircraft. The purpose of these reviews is to identify hazards so as to minimize risks to persons and property and to enhance the likelihood of mission and program success. Formal review requirements will be appropriate for the types of modifications incorporated, the specific mission or project requirements, and the operational risks involved.

2.2.3 The ARP may include several levels of review. Each Center shall clearly identify the appropriate airworthiness review process for experimental, research, and operational configurations and nonstandard ground or flight operations for all aircraft operated by the Center. [81]

2.3 Airworthiness Responsibilities

2.3.1 The Chief, Safety and Mission Assurance formulates NASA safety policy and provides independent oversight of NASA aviation safety and safety procedures or guidelines.

2.3.2 Center Directors shall establish airworthiness, flight safety, mission readiness, and configuration control review processes and procedures to identify any hazards, to manage the risks

associated with flight programs, to ensure safe flight operations, to manage and thoroughly document aircraft configurations, and to ensure that flight objectives satisfy programmatic requirements. [82] Center Directors shall ensure that these review processes and procedures are incorporated into the contracts of those who operate and maintain NASA aircraft. [83]

2.4 Airworthiness, Flight Readiness, and Safety Reviews

2.4.1 Center Directors shall establish procedures to ensure that airworthiness and safety reviews are conducted for flight operations or missions. [84]

2.4.1.1 Reviews shall ensure that hazards associated with aircraft experimental modifications, research, or unique internal or external payloads and nonstandard operations are identified and that risks are adequately managed to enhance the likelihood of mission and program success for all aircraft missions or operations and to minimize the risks to persons or property. [85]

2.4.1.2 Program managers shall review flight programs early in the development cycle to identify the need and schedule for additional safety-related resources, procedures, or reviews. [86]

2.4.1.3 Managers shall ensure that aircraft modifications are accomplished with sufficient time for engineers and technicians to safely complete required tasks. [87]

2.4.1.4 Center Directors shall establish configuration control procedures to ensure that the configuration of each NASA aircraft is fully documented and reviewed. [88] Waivers to a minimum equipment list (MEL) may be granted by the Chief of Flight Operations but may not be delegated to a lower office/position.

2.4.1.5 Center Directors shall establish a MEL for all non-test-related equipment for all aircraft operations. [89] Waivers to a MEL may be granted by the Chief of Flight Operations but may not be delegated to a lower office/position.

2.4.1.6 Test-related equipment will be handled through the flight test planning process. If test equipment remains on the aircraft for non-test-related missions, then such equipment shall be addressed in the aircraft MEL. [90] Waivers to a MEL may be granted by the Chief of Flight Operations.

2.4.2 The ARP is the process by which engineering and safety analyses are reviewed to determine that an aviation system or its component parts meets minimum design criteria, standards, and configuration for the conduct of safe flight operations. The ARP also includes a review of the operations of NASA aircraft when those operations are nonstandard for that aircraft type, place the aircraft into a more hazardous environment than normal, or involve experimental internal or external payloads, configurations, or noncertified external stores, including the dropping of uncertified stores, which may affect the airworthiness of the aircraft.

2.4.2.1 An ARP is required prior to an aircraft commencing its first or subsequent test or research flights in nonstandard configurations or operating envelopes. An ARP approval is valid only for the specific configurations and flight envelopes and operations specified in the approval. Any change to the specified configuration or flight operation requires issuance of a separate or amended ARP approval per individual Center procedures.

2.4.2.2 Examples of configuration and envelope changes requiring an ARP approval include, but are not limited to:

a. Structural and material changes that alter the basic aircraft design configuration.

- b. Modification of the exterior contour or mold line of the aircraft to an experimental configuration (e.g., addition/removal of wing fence, ventral fin, vortex generator, air induction system, auxiliary inlets, and nonstandard antenna configurations or locations).
- c. Modification to the flight control system, including software revisions, to nonstandard configurations.
- d. A new or modified propulsion system or its control system, including software revisions, that is nonstandard for the aircraft.
- e. Modification of the displays or annunciation affecting critical information presented to the aircrew (e.g., situational awareness, aircraft control, air vehicle launch) that are nonstandard for the aircraft.
- f. Modification of any subsystem interfacing with and affecting flight or propulsion systems (e.g., mission computer, navigation, and warning and caution systems) that are nonstandard.
- g. Modification of the aircrew life support systems to nonstandard configurations.
- h. Evaluation of crosswind landing or wet runway landing limits, emergency procedures, structural or flight control limits, wind envelopes, or helicopter external lift, cargo hook system, or tow limits that are outside the normal limits for the aircraft.
- i. Flight test instrumentation that interfaces with normal aircraft systems or that may affect the operation of those systems.
- j. Intentional operation in a degraded mode for test purposes (e.g., simulation of partial loss or malfunction of flight control system, engine, and avionics).
- k. Dropping of uncertified stores or objects.
- l. Any other modifications, payloads, or operations that are nonstandard according to established flight manuals, procedures, or FAA certification requirements (if operated under an FAA airworthiness certificate).

2.4.2.3 Minor aircraft system modifications that do not interface with or affect the standard operation of aircraft systems or alter aircraft aerodynamic characteristics may be reviewed through a configuration control process. Examples of modifications that might fall into this category include such systems as:

- a. Additions of C-band tracking beacons.
- b. Addition of onboard video-recording equipment.
- c. Addition of global positioning system (GPS) recording or tracking systems.

2.4.2.4 The following aircraft modifications may not require airworthiness certification, flight safety, or mission readiness reviews:

- a. Airworthiness Directives, commonly issued by FAA.
- b. Maintenance Advisories, which are issued by multiple sources, such as the U.S. Navy, the U.S. Air Force, and manufacturers.
- c. One Time Inspections (OTI), which may be issued by multiple sources.
- d. Service Bulletins/Service Instructions (SB/SI), which may be issued by manufacturers.
- e. Service Information Letters, which may be issued by multiple sources.

- f. Time Compliant Technical Orders (TCTO), issued by the U.S. Air Force.
- g. Technical Orders (TO).
- h. Technical Directives (TD), issued by the U.S. Navy.
- i. Power Plant Bulletins/Power Plant Changes (PPB/PPC).
- j. Supplemental Type Certificates (STC) issued by the FAA.

2.4.2.5 Modifications to aircraft, such as avionics upgrades, that meet FAA certification requirements, according to applicable FAA regulations, may be handled through a configuration control process.

2.5 Staffing for Airworthiness Review Process

2.5.1 Each Center Director shall ensure that the ARP is staffed with personnel possessing the appropriate scientific, engineering, operational, maintenance, and managerial expertise, including at least one NASA pilot and the ASO. [91]

2.5.1.1 The process reviews project or mission hazards, aircraft modifications, project processes, and procedures related to safety and mission assurance. In addition, the process approves appropriate risk mitigation procedures/techniques and provides oversight for all planned operations.

2.5.1.2 Each Center Director is responsible for establishing a list of senior managers and/or senior engineers who are responsible for conducting the ARP and approving projects or missions for flight, including appointing personnel responsible for managing and executing the Center ARP review board and maintaining records of airworthiness approvals.

2.5.2 The ARP review board may be broken down into several subpanels to facilitate the overall review process. For instance, separate reviews of technical issues and safety hazards may facilitate a detailed review of specific aspects of the project or mission by discipline experts, who then advise the Center review board. Any cockpit or cabin modifications that might interfere with aircrew egress shall be reviewed by a subpanel, including aircrew and life support personnel. [92]

2.5.3 The ARP approval for flight may be for an entire test or research program or be restricted to a certain number of flights or missions and require additional review once defined project or mission goals are achieved.

2.5.4 The ARP shall be continual throughout the course of a project. [93] The Center Director may establish periodic reviews to review project progress subsequent to defined project events (including successes or failures) or at other points in the project to review the overall airworthiness of the aircraft for the intended mission, as well as the progress of the project.

2.5.5 Each Center shall establish the content of the ARP based on the aircraft mission, complexity of the modifications, and the inherent hazards associated with the operation. [94]

2.5.5.1 Content for ARP approvals shall be documented in Center-level ARP procedures. [95] The following are typical of the information required for an ARP to approve an aircraft modification or flight operation for a specific aircraft configuration:

- a. A description of the aircraft modifications, including aircraft configuration, loads, flight envelope, aircraft weight and balance data, reference to applicable mechanical and electrical design documents, reference to applicable software version description documents, and a listing of

associated computer software configuration. The ARP reviews each of these items as applicable for the specific aircraft or subsystems under review.

b. Applicable engineering analyses that describe design criteria, aircraft loads and safety limits, external pod loads, electrical or mechanical system vibrations, aero-elastic vibrations (flutter), aero-servo-elastic effects, thermal loads, electrical system loads, and other abnormal environmental conditions and their effects on aircraft performance, stability, and control or aircraft systems operation. The results of tests conducted to verify the engineering analyses also shall be considered. [96]

c. A description of the required flight operations, including operating procedures, test conditions, maneuvers, required instrumentation, mission control operations, mission rules and flight limitations, nonstandard operation or inspection criteria, and associated checklists. Actions to be taken in the event of in-flight malfunctions or emergency conditions associated with the aircraft modifications or nonstandard operations also shall be described. [97]

d. A safety hazard analysis of systems and operations, including risk assessment and risk reduction actions and the methodology used to reduce the risks to acceptable levels (design, safety devices, warnings, procedure or training, or other methods).

2.5.6 ARP approval is based on the results of Center-approved engineering and safety analyses. The final approval shall contain a description of the configuration of the aircraft, operating instructions and procedures, operating limitations and restrictions, and specific maneuvers or operations for which the aircraft is cleared. [98]

2.6 Maintenance Program

2.6.1 The objective of an effective maintenance program is to ensure that assigned aircraft are serviceable (safe and operable) and properly configured to meet mission requirements in the most cost-effective manner. This is accomplished by performing maintenance, inspection, repair, overhaul, modification, preservation, testing, and condition or performance analyses. Emphasis is placed on processes that reduce the risk of a maintenance failure and the associated impact on operations. The Chief of Flight Operations is responsible for maintaining the airworthiness of aircraft assigned to the Center. The airworthiness of the aircraft includes airframes, engines, propellers, rotors, appliances, and parts. All maintenance and inspections shall be performed in accordance with this chapter and the applicable manufacturers' manuals as appropriate.[99] The Center's Chief of Maintenance is the focal point for all Center aircraft maintenance activities and will ensure that discrepancies between required inspections are corrected to maintain continued airworthiness.

2.6.2 NASA aircraft shall be maintained in accordance with an established and documented Center maintenance program, using standards of quality in workmanship, materials, and support equipment that will ensure airworthiness of aircraft for safety of flight. [100] All NASA aircraft shall be maintained in a condition for safe operation and meet their respective type designs or properly altered condition. [101] It is essential that the continued airworthiness of NASA aircraft be consistent with the terms of the Airworthiness Certificate. A maintenance program shall meet FAA regulations for any passenger-seating capacity for an aircraft that is used for passenger transportation. [102] Documentation is an essential part of maintenance with the objective of providing timely, accurate, and complete information to the Chief of Flight Operations. Use of the NASA standard maintenance application, NASA Aircraft Management Information System (NAMIS) is mandatory.

2.6.3 Depot-Level or Major Aircraft Modifications

2.6.3.1 Center Flight Operations shall maintain continuous onsite oversight of vendors and facilities performing aircraft depot-level overhauls or major aircraft modifications to ensure quality of workmanship, adherence to NASA standards, schedule, and cost control. [103] This oversight function may be performed only by NASA employees or contractors that are independent of the vendor facility to reduce any conflict of interest.

2.6.3.2 Individuals assigned onsite responsibilities shall have expertise and experience in aircraft airworthiness standards and requirements. [104]

2.6.3.3 For maintenance performed outside of NASA, the Chief of Maintenance shall ensure that:

- a. The person(s) performing the maintenance, preventive maintenance, or alteration is properly certificated and qualified to perform the assigned function. [105]
- b. The work performed is done in accordance with the NASA-approved continuous airworthiness program and/or FARs. [106]
- c. A record is made in the aircraft log book of the description of work performed, the date, certificate number, and type of certificate held by the person performing the work. [107]

2.6.4 The NASA process for a continuous airworthiness maintenance program is a compilation of the individual maintenance and inspection functions. These specifications prescribe the scope of the program, including limitations, and the reference manuals and other technical data as supplements to these specifications. The following are the basic elements of a continuous airworthiness maintenance program:

- a. Aircraft Inspection: This element deals with the routine inspections, servicing, and tests performed on the aircraft at prescribed intervals. It includes detailed instructions and standards (or references thereto) by work forms, job cards, and similar documents, which also serve to control the activity and to record and account for the tasks that comprise this element.
- b. Scheduled Maintenance: This element concerns maintenance tasks performed at prescribed intervals. Some are accomplished concurrently with inspection tasks that are part of the inspection element and may be included on the same form. Other tasks are accomplished independently. The scheduled tasks include replacement of life-limited items, components requiring replacement for periodic overhaul, nondestructive inspections, checks or tests for on-condition items, lubrications, and similar activities.
- c. Unscheduled Maintenance: This element provides procedures, instructions, and standards for accomplishing maintenance tasks generated by the inspection and scheduled maintenance elements, pilot reports, failure analyses, or other indications of a need for maintenance.
- d. Engine, Propeller, and Appliance Repair and Overhaul: This element concerns shop operations, which, although they encompass scheduled and unscheduled tasks, are remote from maintenance performed to the aircraft as a unit. Appropriate life-limited parts replacement requirements are included in this element.
- e. Structural Inspection Program/Airframe Overhaul: This element concerns the structural inspections identified as the C and D check level by the manufacturer, airframe major overhaul, major corrosion inspections, Programmed Depot Maintenance (PDM), and Scheduled Depot Level Maintenance (SDLM) or similar inspections. In addition to structural inspection, major airframe overhaul programs require extensive maintenance scheduling.
- f. Required Inspection Items: This element concerns maintenance work items, which, if improperly done or for which improper parts are used, could endanger the safe operation of the aircraft.

Required inspection items appear in all elements of the operator's continuous airworthiness maintenance program.

2.6.5 Each Center shall develop written maintenance procedures and practices in a Center's maintenance manual that supports the aircraft-specific (manufacturer, NASA, or DoD) maintenance programs. [108] While this maintenance program may be completed by contractor maintenance, the contractor is required to follow the Center maintenance manual whose accuracy and currency shall be the responsibility of the Chief of Maintenance.[109]

2.6.5.1 The Center's maintenance manual serves to define the continuous airworthiness maintenance program and to provide procedures and instructions for its use. A comprehensive maintenance plan will be detailed in the Center's maintenance manual and include a list of specific maintenance processes. At a minimum, the following shall be included:

a. A description of how aircraft log books and associated records for assigned aircraft and components are maintained. [110] Maintenance of aircraft log books is essential to ensure the airworthiness of aircraft. Aircraft log books, whether electronic or on paper, provide a history of maintenance, operation, and configuration control of aircraft. Persons signing entries in the aircraft log book and/or entries on serviceable parts tags shall:

(1) Be authorized in accordance with NASA requirements and applicable Federal Aviation Regulations (FARs) and have satisfactorily completed maintenance training or possess the equivalent current experience on the applicable type appliance, aircraft, engine, or propeller. [111] The equivalent experience will be documented on the individual's training record, which is filed in the maintenance organization.

(2) Understand and have knowledge of FARs and the applicable types of maintenance or overhaul manuals and follow the applicable procedures set forth in this manual. [112]

(3) Meet Center-defined certification processes. [113]

b. A documented aircraft release procedure that ensures that all maintenance release authorities are designated in writing. [114] Additionally, there shall be a documented aircraft release process for aircraft that are deployed from the Center. [115] If required, the Chief of Maintenance will designate the maintenance release authority in writing for aircraft deployed from the Center.

(1) Any individual with maintenance release authority shall have at least six months experience during the preceding 24 months in the inspection, servicing, or maintenance of an aircraft or system, in accordance with Center maintenance procedures. [116]

c. Written ground handling procedures that may be accomplished only by qualified ground handling personnel to perform fire guard, application of external electrical power, towing, engine run, and taxi operations that document aircraft-specific training and designate those qualified in writing. [117]

d. A documented Metrology and Calibration (METCAL) program that establishes policy, responsibilities, and requirements to ensure that calibrated and tested tools/special equipment performance is compared to referenced calibration standards (CALSTDs) of known and sufficiently greater accuracy. [118] Calibration ensures that only currently calibrated and tested tools/special equipment operating within established tolerance limits are used to perform maintenance on an aircraft.

e. A documented foreign object damage (FOD) control program that addresses the periodicity and inspection criteria and effectively reduces the risk of FOD both during maintenance and flight operations. [119] The FOD Prevention Program establishes policy, responsibilities, and

requirements to prevent damage to aircraft, engines, ground support equipment (GSE), and other aeronautical equipment and provides uniform FOD reporting procedures. All flight operations personnel and employees shall be constantly on lookout for material that could be ingested into engines, struck by propeller blades, and/or blown by the exhaust of engines or propellers, causing injury to personnel or damage to aircraft. [120] Maintenance personnel shall be assigned to perform a general inspection of hangar and ramp areas for FOD on a weekly basis at a minimum. [121]

f. A documented tool control program (TCP) that ensures the accuracy of tool inventories at specific intervals, contains a lost tool process, and prohibits aircraft from flying until all tools used on an aircraft have been accounted for. [122] The TCP establishes policy and responsibilities for implementing, maintaining, controlling, storing, replacing, and inventorying common hand tools. The TCP is applicable to all NASA activities performing or supporting aircraft maintenance. The TCP shall apply to all commercial and Government activities performing contract maintenance, production, or other support functions on NASA aircraft. [123] This program shall provide instant inventory capability. [124] The primary objectives of the TCP are enhancing safety by eliminating accidents and equipment damage attributed to uncontrolled tools and minimizing tool replacement costs. An effective TCP is the responsibility of all maintenance personnel and all levels of the chain of command.

g. A documented process to ensure that all GSE used on aircraft are safe and operable. [125] GSE shall be maintained per written requirements that document how to identify and remove equipment that is unserviceable. [126] GSE includes all equipment used to make an aeronautical system or end item operational in its intended environment. GSE shall be maintained and documented under an aviation maintenance system or other NASA-approved system. [127]

h. Maintenance procedures and technical standards for Aviation Survival Equipment (including life support and ejection seats) for the equipment being flown, which are an integrated function of aircraft maintenance. [128] If the Center maintains explosive devices (propellant actuated devices (PADs)/cartridge-actuated devices (CADs)), the Center maintenance manual shall document the program for personnel training and qualifications. [129] All tools shall be accounted for after the repack and inspection of each item. For example, parachutes and floatation equipment, since these items cannot be functionally checked prior to use. [130]

i. A documented confined space program that defines all aircraft confined spaces and ensures safety in these spaces prior to entry per NPR 8715.3, NASA's General Safety Program Requirements. [131] The objective of the Aircraft Confined Space Program is to ensure that a safe environment is maintained when working on aircraft fuel cells, tanks, and service areas.

j. A documented program that ensures that aircraft maintenance complies with Center Electromagnetic Interference (EMI)/Electrostatic Discharge (ESD) programs. [132] The EMI/ESD control program establishes policy, responsibilities, and requirements for EMI prevention and reporting and the handling, transportation, storage, and maintenance of ESD-sensitive devices/components. Improper handling, transportation, and storage techniques can cause electrostatic-sensitive devices and components to fail. The insidious nature of ESD-induced failures requires ESD control protection measures to be integral parts of aviation maintenance and supply disciplines. All solid state electronic components and assemblies containing such components are considered ESD-sensitive items, unless otherwise directed by higher authority. These items include printed circuit board assemblies, line replaceable units (LRUs), individual components, and integrated circuits.

k. A Fuel Surveillance Program that ensures that fuel is free of contaminants prior to fuel entering any Center aircraft. [133] The Fuel Surveillance Program establishes policy, responsibilities, and requirements for implementing procedures to maintain aircraft and engine fuel systems' purity. The

Fuel Surveillance Program applies to all NASA aircraft, engines, and test cells to include outside vendor-supplied fuel.

l. A documented program that ensures aircraft maintenance is conducted in compliance with the Center Hazardous Material Program and the Protection of the Environment Act, 40 C.F.R. § 260, Hazardous Waste Management System: General; 40 C.F.R. § 261, Identification and Listing of Hazardous Waste; 40 C.F.R. § 262, Standards Applicable to Generators of Hazardous Waste; 40 C.F.R. § 263, Standards Applicable to Transporters of Hazardous Waste; 40 C.F.R. § 264, Standards for Owners and Operators of Hazardous Waste Treatment Storage and Disposal Facilities; and 40 C.F.R. § 265, Interim Status Standards for Owners and Operators of Hazardous Waste Treatment Storage and Disposal Facilities, which shall include use, disposal, and both long-term and worksite storage of hazardous materials. [134]

m. An oil analysis program, per original equipment manufacturer (OEM) and/or DoD maintenance instructions, to identify mechanical breakdown precursors that exist prior to catastrophic failure. The program shall be specific to the type of engine installed and provide trend analysis, immediate feedback, and recommended actions to the Center's Chief of Maintenance. [135]

n. A documented Weight and Balance (W&B) Program for each aircraft in compliance with any existing Center program. [136] The W&B Program provides the means to ensure that aircraft weight and center of gravity remain within established limits. The program will establish and maintain a master file for each aircraft's weight and balance, schedule aircraft for periodic weighing, and provide procedures for the accountability of basic empty weight and balance during the period between weighing.

o. A configuration control process (CCP) established to determine applicability and ensure compliance with Product Improvement Publications (PIP), which are defined as airworthiness directives, technical orders, service and safety bulletins, or other pertinent requirements, including those from FAA, DoD, or OEMs. [137] The process will allow for documentation of alternate procedures or inspections if they are substituted. It shall provide a complete audit trail of decisions and design modifications. [138] A CCP includes three basic elements: configuration identification, configuration control, and configuration status accounting.

p. An Aviation Material Management process to ensure that aircraft and aircraft parts are inventoried and property accountability records are properly documented per NPR 4100.1, NASA Materials Inventory Management Manual, and Center procedures. [139]

q. General housekeeping to ensure that aviation facilities are maintained by NASA standards for hangars, shops, and ramps. [140]

r. Explosives-laden aircraft shall be parked in designated aircraft parking areas that meet airfield criteria and afford appropriate quantity distance criteria to eliminate hazards to personnel and resources per NASA STD 8719.12, paragraph 5.15.13. [141]

s. A documented aircraft component inspection program to determine the serviceability, authenticity, traceability, and airworthiness of parts, components, accessories, and assemblies by subjecting them to inspections, tests, or operational checks. [142] This program will ensure that aviation parts are segregated from nonaircraft parts.

(1) Organizations providing maintenance support to the Center shall have a procurement program to prevent the purchase of unapproved parts and material in type certificated products. [143]

(2) The Center-approved parts program shall include, at a minimum, methods to establish qualified suppliers who are authorized to manufacture or distribute parts they supply and criteria to identify and screen potential unapproved parts suppliers. [144]

2.6.6 Training

2.6.6.1 A documented training program shall be defined in the Center's maintenance manual that ensures that maintenance personnel and QA inspectors are trained and qualified prior to being assigned. [145] The program shall document the Center-defined recurrent and proficiency training requirements to ensure that maintenance personnel and QA inspectors attend refresher training that addresses changes to aircraft systems, test equipment, or critical troubleshooting and repair techniques at least every 24 months. [146]

2.6.6.2 All maintenance personnel that are qualified to perform servicing, inspections, and functional tests shall have completed the required training program, which shall be documented in their individual training records. [147]

2.6.6.3 The training program shall include all Center safety program training requirements, including training on fire protection equipment, medical stations, and hazardous materials. [148]

2.6.6.4 Within the training program, all required support functions shall be addressed. These include computer training, logistics training, and operator training for facilities and ground support equipment such as hoists, tow tractors, and lifts. [149]

2.6.6.5 Qualification records shall be kept up to date by the Chief of Maintenance or Center Training Officer to reflect both resident and onsite training. [150]

2.6.7 NASA Aircraft Management Information System (NAMIS)

2.6.7.1 NAMIS consists of eight separate but integrated modules. NAMIS shall be utilized to track servicing, inspections, and METCAL compliance. [151]

2.6.7.2 The following NAMIS modules are mandatory for active NASA-owned or -bailed aircraft: Flight Records/Currency, Flight Data Capture, Aircraft Maintenance, Flight Scheduling Application (FSA), and Aircraft Logistics' Spares Inventory.

2.6.7.3 The remaining NAMIS modules are optional, but NAMIS can be used to track demands (i.e., requisitions) and shall be used to track receipts and issues, regardless of how or who requisitioned the item. [152]

2.6.8 Quality Assurance (QA)

2.6.8.1 A comprehensive aircraft maintenance QA program is critical to flight safety. Each NASA Center that is responsible for the maintenance of NASA aircraft shall ensure that QA is integrated into every aspect of aircraft maintenance and that only fully qualified personnel are assigned as QA inspectors. [153] The Center shall operate a program to provide for analysis and surveillance of its continuous airworthiness maintenance program, including work performed according to Center requirements by a non-NASA entity. [154]

2.6.8.2 Special skills and experience not normally possessed by maintenance personnel are required of a staff of trained QA personnel for analysis of data and supervision of QA. Only fully qualified personnel are assigned as QA inspectors. Maintenance personnel assigned to QA are assigned as a collateral duty with limited authority, as determined by the QA Chief.

2.6.8.3 Each Center shall develop a written QA plan or quality management system (QMS) that covers all aspects of maintenance, material acceptance, documentation review, maintenance instruction applicability, and currency. [155] QA shall ensure that aircraft configuration and aircraft components have been properly maintained and that all requirements have been properly documented. [156] QA shall provide trend analysis and investigation of recurring discrepancies,

high-failure-rate components, and high-usage materials to identify underlying causes for poor quality. [157]

2.6.8.4 The terms inspection, QA, and audit have separate and distinct meanings and should be used accordingly.

- a. Inspection is the examination/testing of supplies (including raw materials, documents, data, components, and assemblies) and services to determine if they conform to technical requirements.
- b. QA is the planned and systematic pattern of actions necessary to provide adequate confidence that maintenance will be performed satisfactorily for in-service maintenance and that monitoring, surveillance, and analysis of data will be carried out to verify the validity of work completed, maintenance processes, and procedures.
- c. Audit, as it applies to QA, is a periodic or special evaluation of details, plans, policies, procedures, products, directives, and records.

2.6.8.5 QA responsibilities shall be performed to:

- a. Establish qualification requirements for QA personnel and collateral duty personnel. Centers shall maintain a list of all personnel qualified and authorized to conduct inspections. [158]
- b. Provide a continuous training program in techniques and procedures pertaining to aircraft maintenance QA, per paragraph 2.6.4, and the conduct of inspections. [159]
- c. Ensure that established standard procedures are observed for conducting scheduled and unscheduled inspections, ground tests, and bench check of components, including engines. [160]
- d. Ensure that the configuration of aircraft and components is correct and all essential modifications have been incorporated. [161]
- e. Ensure that an inspection is conducted on all equipment received for use, returned for repair, or held awaiting repair to verify satisfactory material condition, identification, packaging, preservation, and configuration and, when applicable, that shelf-life limits are not exceeded. [162]
- f. Ensure that check pilots and aircrew are briefed before postmaintenance functional check flights (FCF) so that the purpose and objectives of the flight are clearly understood. After completion of the FCF, debrief the check pilots, aircrew, maintenance control representative, and applicable work center representatives to determine compliance with objectives outlined on the FCF checklist and clarify noted discrepancies. [163]
- g. Review all incoming technical publications and directives to determine their applicability to Center-maintained aircraft. [164]
- h. Conduct Parts and Hardware Certification of all items procured. All incoming serviceable aircraft material, parts, or components will be placed in a secured area and inspected by a QA inspector or designee. Ensure that the part or material is in good condition and conforms to specifications and standards. Ensure that certification paperwork or data is correct for applicability and acceptance requirements. [165]
- i. Ensure that personnel are trained in the Government-Industry Data Exchange Program (GIDEP) and FAA Suspected Unapproved Parts (SUP) Program and coordinate all actions with the Center's GIDEP office, HQ AD, and the Inspector General (IG), as appropriate. [166]
- j. Monitor weight and balance of all Center aircraft, in accordance with Center guidelines. [167]
- k. Validate all work orders (excluding minor aircraft write-ups/gripes) and oversee the installation of

all work orders on aircraft. [168]

l. Assist the ASO in the impounding of Center aircraft involved in a mishap or when directed by ASO. [169]

m. Monitor maintenance using a program to develop trend analysis of processes. This program analyzes all reports of findings and/or actions taken during aircraft and component maintenance. [170]

2.6.8.6 QA Inspection Requirements.

a. Mechanic and QA signatures are required for the following maintenance actions: down discrepancy and special preflight--FCF, special configuration, and special flight purpose.

b. Mechanic and QA signatures are required for all back shop repairs.

2.6.8.7 Surveillance or monitoring programs use product or process surveillance based on an effective audit program and an objective statistical history. Sampling and surveillance verifications shall be used independently, or in combination, to accomplish the verification function of all QA processes. [171]

2.6.9 Technical Publications Library

2.6.9.1 The Technical Publications Library provides a central source of up-to-date information for use by all personnel in performing their work and is the source of reference information to facilitate personnel training and individual improvement.

2.6.9.2 The Technical Publications Library's function includes: determining which technical manuals are required to support maintenance of aircraft, their major components, and ground support equipment in the NASA inventory; receipt and distribution control of these manuals; and responsibility for ensuring manual updating throughout the maintenance organization. All manuals shall be maintained in accordance with the original manufacturers' updates or revisions (or DoD updates or revisions for DoD aircraft) as modified with NASA- or FAA-approved data. [172] Centers shall maintain documentation to confirm that periodic revision status audits of the technical library have been conducted. [173] Exceptions to this policy, including additional changes to documents, shall be approved by the Chief of Flight Operations. [174]

2.6.9.3 For remote sites, the Technical Publications Librarian is responsible for the distribution of manuals and inspections of remote libraries.

Chapter 3. Research and Program Support Operations

This chapter applies to NASA-piloted aircraft used for research and program support operations.

3.1 Operations

3.1.1 Flight Authorization

3.1.1.1 Center's Chiefs of Flight Operations shall establish procedures to ensure that all flights of NASA aircraft are properly approved and documented, allowing for all contingencies such as deployed aircraft and aircraft ferry approvals. [175]

3.1.1.2 Emergency lifesaving, humanitarian operations, and Homeland Security missions, as pre-approved by the Center Director, may be carried out in any NASA aircraft designated. The circumstances shall be documented and reported to the Assistant Administrator for the Office of Strategic Infrastructure within 30 days of action.[176]

3.1.2 Stabilized Approach

3.1.2.1 All NASA aircraft operations shall establish applicable stabilized-approach criteria suited to their particular flight operation. [177] The optimum stabilized approach is defined as a flight on the glide path (visual or electronic) at a steady rate of descent, on the target approach speed, in the landing configuration, in trim, and with the proper thrust/torque setting. The dynamics of flight often dictate that flight parameters will vary from the optimum.

3.1.2.2 In the absence of flight manual or aircraft directive guidance, a stabilized approach shall be established by minimum descent altitude or 100 feet above precision minimums in instrument meteorological conditions (IMC), by 500 feet above airport elevation in visual meteorological conditions (VMC), and by 300 feet above airport elevation for a circling approach or overhead patterns. [178]

3.1.2.3 In the event that a stabilized approach is not established by the altitudes required in paragraph 3.1.2.2, a missed approach shall be executed. [179]

3.1.3 TCAS and TAWS Systems

3.1.3.1 Inherent to flying aircraft, there are two specific risks while conducting aircraft operations: midair collisions and controlled flight into terrain (CFIT). Industry and the Government are continually looking at ways to control these two specific risks through avionics improvements and Federal regulations. As part of the Agency's continuous risk management process, all NASA flight operations shall manage these risks in accordance with the specific provisions of this NPR and NPR 8000.4, Agency Risk Management Procedural Requirements. [180]

3.1.3.2 All manned NASA aircraft shall be configured with FAA-approved TCAS and TAWS for the specific type model aircraft. [181]

3.1.3.3 As part of the Agency's continuous risk management process, all NASA flight operations shall develop a TCAS/TAWS Risk Management Plan for all manned aircraft in a Center's inventory not configured with these two systems. [182] The plan will identify the RAC associated with these risks, the abatement plan to control these risks, and the funding priority that has been assigned to

close these risks. NPR 8715.1, NASA Safety and Health Occupational Safety and Health Programs, and Appendix B. NASA Form 1584-Safety and Health Hazard Abatement Plan, contain guidance for abatement activity.

3.1.3.4 The order of preference for risk controls is: a) engineering (design, material, or substitution), b) administrative (signage/notices, standard operating procedures (SOPs), training, or limiting exposure), and c) Personnel Protective Equipment.

3.1.3.5 The TCAS/TAWS Risk Management Plan will be updated annually.

3.1.3.6 All manned NASA aircraft contracted through commercial vendors shall be configured with FAA-approved TCAS and TAWS systems for the specific type of model aircraft. [183]

3.1.4 All flight deck crew members of large or turbojet aircraft shall communicate through a boom or throat microphones below the transition level/altitude. [184]

3.1.5 Conduct of flight crew training for simulated emergencies, or for abnormal situations with passengers on board, is prohibited.

3.2 Assignment of Pilot in Command of NASA Aircraft

3.2.1 The PIC of a NASA aircraft shall be a designated NASA pilot. [185] Designated NASA pilots are those who perform piloting duties as a part of their official position description, fulfill NASA contract requirements, or fly in accordance with an interagency agreement, such as a military pilot on loan to NASA. Center's Chiefs of Flight Operations, with the concurrence of the Center Director, may designate as a PIC, on a temporary basis, individuals possessing required aeronautical qualifications to support NASA's requirements.

3.2.2 The PIC of a NASA aircraft is responsible, at all times, for the safe operation of the aircraft and the safety of its occupants and is the final authority as to whether a flight will occur. The PIC is the final authority as to whether a flight will be delayed or diverted for reasons of weather, aircraft conditions, or other safety-related considerations.

3.2.3 The PIC of a NASA aircraft shall ensure that the crew is briefed on the mission plan, safety procedures, and emergency information, including emergency egress. [186]

3.2.4 Center's Chiefs of Flight Operations shall have a process to train, designate, and document individuals authorized to pilot Functional Check Flight operations. [187]

3.2.5 All NASA PICs shall be trained on the operating rules and procedures of the FAA FARs and the ICAO Rules of the Air when operating in international airspace. [188]

3.2.6 The duties and responsibilities of the PIC shall be specified in the Center's policy, in accordance with Agency standards of practice. [189]

3.2.7 The PIC of any NASA aircraft entering a foreign country shall be responsible for the custody and care of disembarking passengers and crewmembers from the time they leave the aircraft until they are accepted for examination for entry into a State. [190]

3.2.8 A pilot flying as second-in-command (SIC) on a NASA aircraft, when required, reports to the PIC and will carry out any delegated duties.

3.3 Documentation

3.3.1 All flight crew currency documentation shall be recorded in the NASA standard application, NAMIS. [191]

3.3.2 NASA UAS flight time shall be kept separate from NASA manned aircraft flight time, by type, in NAMIS. [192]

3.3.3 Each Center shall establish a means to document that flight critical information has been passed to all flightcrews. [193]

3.3.4 Records pertaining to NASA's flight activities shall include, at a minimum, the following:

- a. Approval of mission.
- b. Name and duty status of all on board.
- c. Purpose of the flight.
- d. Routing or flight events and takeoff /landing times. [194]

3.4 Flightcrew Requirements and Currency

3.4.1 NASA flightcrews shall be qualified in accordance with written standards set forth in Center-developed criteria. [195]

3.4.1.1 Records of qualification and flight evaluation are required and shall be maintained in aircrew training records. [196]

3.4.1.2 A review of pilot and crew qualifications shall be made prior to flight assignment to ensure that prerequisites for the intended mission are met. [197]

3.4.1.3 The Center's Chief of Flight Operations shall designate the crewmembers for aircraft that are under the Center's purview. [198]

3.4.2 NASA flightcrews will be medically certified using NASA medical qualifications, per Chapter 7.

3.4.3 A comprehensive pilot proficiency program is critical to flight safety for pilots flying research and program support missions. Such programs are specific to the assigned missions and reflect an in-depth evaluation of pilot proficiency and capability. Elements of pilot proficiency programs include the following:

3.4.3.1 Center Flight Operations shall impose sufficient proficiency requirements or flight time/sortie requirements on flightcrews to meet mission needs. [199] Private pilot time shall not be recorded in NAMIS or utilized to meet any proficiency requirements. [200]

3.4.3.2 Each Center shall develop a written flightcrew training plan which, at a minimum, shall meet the following requirements:

- a. Annual night flying requirements.
- b. Landings in category (fixed-wing/rotorcraft).
- c. Six instrument approaches under actual or simulated conditions within 6 calendar months
- d. Completing 100 hours of flight time, per fiscal year, in any aircraft or flight simulator approved by the Center's Chief of Flight Operations, or 80 hours of flight time and 100 sorties if all are flown in the same model, design, and series of aircraft or flight simulator. [201]

3.4.3.3 Center directives shall establish separate aircrew qualification and currency requirements for unique aircraft (e.g., project, military, experimental) in which the aircrew cannot meet the above requirements. [202].

3.4.3.4 Lapse in Qualification. Crewmembers overdue the annual flight time requirement are disqualified for assignment as PIC or SIC. The Center's Chief of Flight Operations shall document the method to regain qualification in the flightcrew training plan and notify the Assistant Administrator for the Office of Strategic Infrastructure, via HQ AD, of this action in a letter from the Center's Director. [203] At a minimum, it will include a dedicated training flight or training in a simulator and a formal flight evaluation by an instructor pilot prior to further mission assignments. The Center's Chief of Flight Operations shall establish requalification procedures for pilots not meeting any of the remaining requirements above. [204]

3.4.4 Flight proficiency shall be evaluated at least annually by a NASA or NASA-designated pilot, who is an instructor or examiner pilot, in the aircraft used for the evaluation. [205] When available, a suitable simulator, or its equivalent, may be used for this purpose at the discretion of the Center's Chief of Flight Operations. Evaluations conducted by 14 C.F.R § 142, Training Centers, also may be used to satisfy pilot annual evaluations, at the discretion of the Center's Chief of Flight Operations.

3.4.5 Pilot Instrument Evaluations. Instrument flying proficiency shall be evaluated at least annually using professional aeronautical standards such as FAA Instrument Practical Test Standards. [206] The instrument evaluation may be combined with the annual proficiency evaluation or completed separately. The instrument proficiency check may be accomplished in a simulator approved by the Center's Chief of Flight Operations.

3.4.6 Simulations. Annual flight simulator training in each aircraft category (fixed-wing/rotorcraft) is required, if available. If there is no specific simulator for the aircraft type, a simulator of the same category aircraft should be used. Realistic, mission-oriented scenarios may be used to complement the annual proficiency and instrument check requirements.

3.4.7 Tests. Written tests shall be administered and reviewed annually by a check pilot to ensure current pilot knowledge of air traffic control procedures, aircraft systems, and normal and emergency operating procedures, Agency and local instructions, and other pertinent regulations and procedures. [207] Centers co-located with military organizations who conduct "instrument schools" may substitute such training for the above ATC procedural testing.

3.4.8 Reviews. Pilot annual flight evaluations shall be reviewed by the Center's Chief of Flight Operations. [208]

3.4.9 Guest Pilots/Researchers. Each Center's Chief of Flight Operations shall establish local instructions regarding training and currency requirements that must be met for a guest pilot/researcher. [209]

3.4.10 Media Flights. The Center shall establish policies for flying media representatives. [210]

3.4.11 Flight Engineers shall possess an FAA Flight Engineer Certificate appropriate for the aircraft category or equivalent military certification. [211]

3.4.11.1 Centers shall develop alternate training programs to satisfy this requirement should these personnel not be available. [212]

3.4.12 Qualified non-crewmembers shall be authorized by the Chief of Flight Operations to participate in flight operations to support mission requirements. [213]

3.4.12.1 Qualified non-crewmembers shall be trained and will maintain qualification (in accordance

with local Center policies and procedures), which shall include, at a minimum, cabin emergency, egress procedures and medical clearances. [214]

3.4.12.2 Qualified non-crewmembers are not passengers. Their presence on a flight is in direct support of, or associated with, the flight or mission that the flight is supporting. Examples of qualified non-crewmembers include, but are not limited to, media representatives observing the mission, scientists conducting in-flight experiments, and mission managers supporting the mission or flight on the ground.

3.5 Ground Training

Each primary crewmember must receive ground training, as specified in paragraph 4.13, with a refresher training every 12 months for pilots. [215]

3.6 Readiness Reviews

3.6.1 There are two categories of readiness reviews, which may be applied to both piloted aircraft and UASs:

- a) Flight Readiness Review (FRR)/Operations Readiness Review (ORR) focuses on flight operational safety.
- b) Mission Readiness Review (MRR) focuses on mission operational safety using multiple aircraft and multiple activities to ensure mission success.

3.6.1.1 Program managers shall conduct an MRR when multiple aircraft operations are to be conducted. [216]

3.6.1.2 Prior to conducting an FRR/ORR, each individual aircraft involved in the flight or campaign shall have an approved Certificate of Airworthiness. [217]

3.6.2 Personnel who should attend these reviews include the Safety and Mission Assurance Office, the mission manager and/or Principal Investigator, the Range Safety personnel, the Flight Operations personnel, the ASO, and, in the case of UAS operations, the UAS operator. The Chair of the Center Airworthiness Process Program or a representative shall attend all readiness reviews. [218]

3.6.3 An FRR/ORR reviews the operational requirements for a specific flight or campaign. A supervisory Flight Operations pilot or other Flight Operations supervisory personnel shall chair and approve the FRR/ORR flight authorization. [219] Areas of consideration will include:

- a. Science mission requirements.
- b. Flight operations procedures.
- c. Operational Go/No-Go criteria.
- d. Pilot qualifications, flight operations training, and flight manuals.
- e. UAS operations requirements.
- f. Aircraft configuration.
- g. Aircraft maintenance.
- h. Science payload and operations.

- i. Payload combination.
- j. Status of reviews.
- k. Special weather conditions.
- l. Science functional flight test plan.
- m. Pre-accident and/or incident plan.

3.6.4 An MRR reviews the mission interoperability of multiple aircraft from multiple activities to ensure mission success for a specific flight event or campaign. Activities may be different Centers, other Federal agencies, military services, commercial vendors, or non-NASA aircraft. Prior to conducting an MRR, each aircraft involved in the flight or campaign shall have an approved FRR/ORR. [220]

3.6.4.1 The program/project management of the flight/campaign event shall assign an individual who has authorization to proceed with the flight program to chair and make the MRR evaluation. [221]

3.6.4.2 The focus of this review is to ensure that the Principal Investigators and the flightcrews or UAS operators have made the coordination and arrangements required to maximize operational safety and ensure mission success. The MRR shall consider the following:

- a. Flight experiment and science flight requirements.
- b. Organizational and functional chart.
- c. Payload status.
- d. Flight operations procedures.
- e. Aircraft separation/coordination.
- f. Communication plan.
- g. Inter-Center/interagency communication/coordination plan.
- h. Ground operations procedures dealing with hazardous systems.
- i. Schedule timeline.
- j. Roles and responsibilities.
- k. Science coordination requirements.
- l. Program/Project Mishap Preparedness and Contingency Plan.
- m. Liability coverage.
- n. Deployment.
- o. Logistics.
- p. Public affairs/outreach.
- q. Mission assurance. [222]

3.6.5 Centers, Component Facilities, and contractors that do not have an aircraft operations department and operate NASA aircraft/UASs shall coordinate with an alternate NASA Center

aircraft operations department for FRR/ORR and MRR services and support. [223]

Chapter 4. Mission Management Flight Operations

4.1 Purpose

4.1.1 This chapter establishes policies and procedures for management, use, operation, and control of Government aircraft when used or controlled by NASA to transport passengers or cargo. The definition of passengers does not include crewmembers or qualified non-crewmembers who are directly associated with the conduct or purpose of the flight. For example, researchers conducting or observing their experiments aboard the DC-8 are qualified non-crewmembers. A media representative aboard a Space Shuttle training aircraft observing NASA's flight operations for public affairs purposes would also be a qualified non-crewmember. NASA aircraft are defined, herein, as aircraft owned, leased, chartered, or rented by NASA, in accordance with NPD 7900.4 and OMB Circular A-126. Mission management flight operations are defined as the use of NASA aircraft to transport passengers or cargo.

4.2 Policy

4.2.1 In compliance with OMB Circular A-126, NASA will not own aircraft exceeding the number, size, and capacity necessary to meet documented mission requirements. NASA aircraft are public aircraft, as defined by 49 U.S.C. § 40102, Definitions, but are operated as civil aircraft when carrying passengers. NASA aircraft are prohibited from carrying passengers when operating as public aircraft.

4.2.1.1 When operated as civil aircraft, maintenance and aircrew standards shall meet the requirements for retention of FAA airworthiness certification and operation. [224] Those requirements must be followed for any NASA mission management flight that carries passengers.

4.2.1.2 The Certificate of Airworthiness shall be displayed, per 14 C.F.R § 91.203, Civil Aircraft: Certifications Required, Subparts (a) and (b). [225]

4.2.1.3 Mission management flights shall be operated and maintained in accordance with 14 C.F.R. § 21, Certification Procedures for Products and Parts; 14 C.F.R. § 21, Certification Procedures for Products and Parts; § 39, Airworthiness Directives; § 43, Maintenance, Preventative Maintenance, Rebuilding, and Alteration; § 61, Certification: Pilots, Flight Instructors, and Ground Instructors; § 65 Certification: Airmen Other Than Flight Crewmembers; and § 91, General Operating and Flight Rules. [226]

4.2.1.4 Centers shall develop policies/procedures to operate mission management flights in accordance with the procedures specified in OMB Circular A-126 and 41 C.F.R., Chapter 101-37, Government Aviation Administration and Coordination, as well as the provisions of this chapter. [227] Procedures of the International Civil Aviation Organization (ICAO)

apply, in lieu of 14 C.F.R. § 91, General Operating and Flight Rules, on international flights.

4.2.2 Mission management flights shall be conducted only in support of activities that constitute the discharge of NASA's official responsibilities and only when the aircraft is not otherwise scheduled for Mission Required or Required Use flight operations. [228]

4.2.2.1 NASA employees shall not use mission management flights if commercial airlines, charter aircraft services, or ground transportation are reasonably available to meet the mission need, unless the flight is cost justified in accordance with OMB Circular A-126 and this chapter. [229]

4.2.2.2 Mission management flights may be conducted for the transportation of authorized personnel on official Government business, in accordance with OMB Circular A-126. Such travel may be approved only after following all requirements of this chapter.

4.2.3 Flights that require excessive deadheading or involve long, unproductive layovers shall be avoided, absent special emergency situations. [230]

4.2.4 Whenever practicable, inter-Center airlift requirements shall be combined. [231]

4.2.5 Each passenger traveling aboard NASA mission management flights shall be a U.S. Government employee or contractor on official U.S. Government business and have either an approved NASA travel authorization, in accordance with NASA directives, or a travel authorization approved by another Federal agency or Congressional committee. [232] Travel authorized by another Federal agency or Congressional committee also shall be approved by an Official-in-Charge of a Headquarters Office or a NASA Center Director. [233]

4.2.5.1 Flight crewmembers on mission management flights may be considered as passengers for cost-justification purposes when they have either an approved NASA travel authorization, in accordance with NASA directives, or a travel authorization approved by another Federal agency or Congressional committee for purposes or activities beyond their crew flight duties.

4.2.5.2 The names of the passengers and purpose of travel for such passengers shall be documented in the mission management flight request form. [234] Per 41 C.F.R., § 300, Federal Travel Regulation System--General, contractors working under a contract with an executive agency are considered Federal travelers and may travel on a Government aircraft.

4.2.5.3 In special emergency situations that are approved by the Assistant Administrator for the Office of Strategic Infrastructure or at the Center Director level, other persons may be permitted to travel aboard NASA mission management flights for emergency or humanitarian purposes or on a space available and cost-reimbursable basis. Reimbursement by nonofficial travelers shall comply with paragraph 4.7. [235]

4.2.6 All passengers shall be manifested on NASA Form 1269, Flight Itinerary and Passenger Manifest. [236]

4.2.6.1 Prior to departure of any mission management flight, the PIC shall certify the accuracy of the manifest and file a copy with a responsible ground agency such as a military, civil, or NASA operations office. [237]

4.2.6.2 The PIC is relieved of the requirement to provide the manifest if a NASA official has been designated as the ground coordinator for the flight with responsibility for maintaining the manifest.

4.2.7 NASA mission management flight operations shall be conducted under the cognizance of the Assistant Administrator for the Office of Strategic Infrastructure. [238]

4.3 Classification of Mission Management Flights

4.3.1 Required Use. Mission management flights may be classified as Required Use only if the use of Government aircraft is required because of bona fide communications or security needs or exceptional scheduling requirements. Required Use designation shall be controlled solely by the NASA Administrator and approved in accordance with paragraph 4.4.2 of this chapter. [239]

4.3.2 Mission Required. Mission management flights may be classified as Mission Required only when failure to use a NASA aircraft would have a clear, negative impact on a NASA operational mission, prevent timely response to an aircraft or spacecraft accident, or threaten the health and safety of NASA personnel, and only when such travel could not be conducted using commercial airlines, charter aircraft service, or ground transportation to fulfill that mission need. All passenger travel that can reasonably be performed using commercial airlines, charter aircraft service, or ground transportation to meet the mission need may not be designated as Mission Required. Classification of a mission management (passenger or cargo) flight as Mission Required requires approval from the Assistant Administrator for the Office of Strategic Infrastructure before the flight and shall be coordinated with the HQ AD. [240] Refer to paragraph 4.4 of this chapter for approval procedures. Mission management flights also may be designated as Mission Required for nontravel activities that support NASA's official responsibilities. Such activities include, but are not limited to, training, evacuation (including medical evacuation), search and rescue, aeronautical research, space and science applications, and other such non-travel activities as cited in OMB Circular A-126. Mission Required use maynot include official travel to give speeches, attend conferences or meetings, or make routine site visits. Cost justification in accordance with OMB Circular A-126 is not required for Mission Required flights.

4.3.2.1 Flights can only be designated as Mission Required if such travel cannot be conducted using commercial airlines, charter aircraft services, or ground transportation to fulfill that mission need. Examples of Mission Required mission management flights include, but are not limited, to the following:

Table 4-1 Mission Requirements

International Space Station Program
a. Return International Space Station crews after landing.
b. Provide transportation for emergency response to in-space operations problems and unexpected events.

Space Shuttle Program

c. Provide emergency transportation capability for KSC Shuttle launch/landing rapid response team for each Shuttle launch.
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d. Provide transportation capability for initial response to space vehicle post-mishap investigations.
--

e. Needed for emergency response to in-space operations and unexpected events. (unscheduled and time-critical events)

f. Provide transportation of the dependent families of the astronaut crewmembers to and from launches and landings.

g. Provide transportation for prime flight crewmembers to/from launch site during pre-launch countdown and post-launch activities.
--

Science Programs

h. Transport emergency response teams and equipment to flight research mishaps or aircraft grounded off station due to maintenance problems.
--

i. Return hardware and data from the landing site of remotely operated space probes.
--

j. Transport equipment to support flight research for unscheduled and time-critical events to accommodate tight launch schedules.

k. Provide contingency, fast-response capability for launch and search and recovery operations for sounding rockets launched from the Wallops Island range.

Natural Disaster Response

l. Hurricane and other natural disaster evacuation and response to protect NASA personnel and property.

4.3.3 NASA mission management flights that are not classified as Required Use or Mission Required are classified as Other Official Travel. Agency official travel will normally be accomplished using commercial airlines or available means of ground transportation. Travel on mission management flights that are designated as Other Official Travel shall be authorized in advance on a trip-by-trip basis as detailed in Section 4.4. [241] NASA employees shall not use mission management flights for Other Official Travel if commercial airline, charter aircraft services, or ground transportation is reasonably available, unless the flight is cost justified in accordance with OMB Circular A-126 and this chapter. [242]

4.3.4 Examples of Other Official Travel include, but are not limited to, the following:

a. Travel to give speeches.

b. Travel to accept awards.

c. Travel to make routine site visits.

d. Travel to attend NASA-sponsored meetings, including meetings for Flight Readiness Reviews, Launch Minus-2, Launch Minus-1, launch or landing activities, launches of other NASA-related payloads, launch recovery operations, Soyuz launch and recovery operations, NASA advisory committees, council and board meetings, professional conferences, or contractor conferences.

4.3.5 Other Official Travel that is not Required Use or Mission Required, as defined in paragraph 4.3.3, shall be authorized only when either:

a. No commercial airline or aircraft (including charter) service is reasonably available (i.e., able to meet the traveler's departure or arrival requirements within a 24-hour period), unless extraordinary circumstances require a shorter period to effectively fulfill Agency requirements. (When using "no commercial airline or aircraft service is reasonably available" to justify the use of mission management flights, actual airline schedule information shall be provided as part of, and attached to, the aircraft request) OR

b. The actual cost of using a Government aircraft is not more than the cost of using commercial airline or aircraft (including charter service). [243]

4.3.5.1 Such cost justification shall be computed consistent with paragraph 4.4.5.a. [244]

4.3.6 Mission Required or Required Use flights (certified under the terms of paragraph 4.4) may transport passengers on Other Official Travel when space is available and such travel is approved in strict compliance with this chapter. Under these circumstances, such mission management flight use may be presumed to result in cost savings to the U.S. Government, and a cost justification is not required and should not be completed on NASA Form 1653 for the flight.

4.3.7 Use of NASA aircraft for passenger transportation purposes, regardless of travel classification category, shall follow the same requirements as used for all other mission management flights, including compliance with 41 C.F.R. 101-37, Government Aviation Administration and Coordination, and OMB Circular A-126, flight request and approval using NASA Form 1653, cost justification on NASA Form 1653 as required, and obtaining travel authorization approvals. [245]

4.3.7.1 When operated as civil aircraft, maintenance and aircrew standards shall meet those required for retention of FAA airworthiness certification and operation and shall be followed for any NASA mission management flight that carries passengers. [246]

4.3.7.2 The Certificate of Airworthiness shall be displayed, per FAR 91.203 (a) and (b). [247]

4.3.7.3 Centers shall exercise caution to ensure that aircraft are returned to their FAA-certificated configuration after being modified for program support or research purposes. [248] Refer to Section 4.9 for specific policies and procedures for flying passengers on research or program support aircraft.

4.3.8 Nonofficial travel on NASA mission management flights is the use of remaining aircraft seating capacity for nonofficial purposes on a flight that is scheduled for official Government business. Nonofficial travel on NASA mission management flights shall be

authorized only when all the following conditions are met:

- a. The aircraft is already scheduled for use for an official purpose.
- b. Such nonofficial travel use does not require a larger aircraft than needed or alteration of flight itinerary for the official purpose.
- c. Nonofficial travel use results only in minor additional cost to the Government. [249]

4.3.8.1 All nonofficial travelers shall reimburse the U.S. Treasury, in accordance with Section 4.7. [250]

4.3.9 The Center Director shall certify, in writing, that nonofficial travel on a scheduled flight has met the above conditions. [251]

4.3.9.1 The Center shall retain this certification for a minimum of 2 years. [252]

4.3.9.2 In an emergency situation, prior verbal approval by the Center Director, with an after-the-fact written certification, is permitted.

4.4 Approval of Flights

4.4.1 All flights with passengers aboard NASA aircraft assigned to a Center shall be reviewed by the Center's Chief Counsel for compliance with 41 C.F.R., § 101-37, Government Aviation Administration and Coordination, and OMB Circular A 126, and approved in advance by the Center Director. [253]

4.4.1.1 In the case of aircraft assigned to HQ, those flights shall be reviewed by the General Counsel or Deputy General Counsel and approved in advance by the Assistant Administrator for the Office of Strategic Infrastructure. [254]

4.4.1.2 All flights classified as Other Official Travel that have Senior Federal Officials aboard shall be reviewed by the General Counsel and approved in advance by the appropriate NASA HQ or Center approval authority. [255] This review and approval authority may not be delegated.

4.4.2 Mission management flights also shall be approved in advance, in writing, and generally on a trip-by-trip basis. [256]

4.4.2.1 The Administrator shall in each instance determine the appropriateness of Required Use flights following a finding of compliance with OMB Circular A-126 requirements by the General Counsel. [257]

4.4.2.2 While the Administrator may make a blanket determination that all use of NASA aircraft by certain employees, or travel in specified categories, qualifies as Required Use travel, such determinations shall likewise be in writing, be determined to be compliant with OMB Circular A-126 requirements by the General Counsel, and set forth the justification for that determination. [258]

4.4.2.3 The Center Director shall complete the following when a member of the flightcrew also is considered a passenger:

- a. The justification shall be annotated in the remarks section of NASA Form 1653. [259]
- b. The flightcrew member shall have either a NASA travel authorization approved in accordance with NASA directives or a travel authorization approved by another Federal agency or Congressional committee for purposes or activities beyond their crew flight duties. [260]
- c. The flightcrew member shall be listed as a passenger on Form 1653. [261]
- d. If the flightcrew member is a Senior Federal Official, a family member of such Senior Federal Official, or a non-Federal traveler, the flight request shall be reviewed by the General Counsel. [262]

4.4.3 Flights classified as Mission Required, where NASA personnel are traveling to meet mission requirements, also shall be reviewed by the General Counsel and approved in advance by the Assistant Administrator for the Office of Strategic Infrastructure. [263] Refer to Figure 4-1 for the approval process flow chart. The Assistant Administrator for the Office of Strategic Infrastructure shall ascertain, prior to authorizing the flight, that the purpose of the trip is for Mission Required travel, as described in paragraph 4.3.2. [264] Should special emergency situations preclude preflight review and approval, immediate action to review and approve the flight shall be taken as soon as practicable, following the flight. [265]

4.4.3.1 Flights classified as Mission Required conducted on research or program support aircraft, where passengers are aboard, but the primary purpose of the flight is not passenger transport, may be approved at the Center Director's level with Center Counsel's review. General Counsel shall review the flight in advance if a Senior Federal Official, families of such Senior Federal Officials, or non-Federal travelers are passengers. [266] Refer to Figure 4-2 for the approval process flow chart (Figure 4-4, if a Senior Federal Official is a passenger). Cost justification is not required. Authorization shall be coordinated with the HQ AD. [267] An example of such a flight would be a program support flight to provide photographic chase on a research object, or aircrew training to meet minimum proficiency standards. In this example, the primary purpose of the flight is not passenger transport. However, in addition to the crewmembers and qualified non-crewmembers directly involved with the flight's primary mission, support personnel, or other official travelers, may be carried as passengers providing that all other applicable provisions of this chapter have been met. A Mission Management Flight Request (NASA Form 1653) is required, and the passenger manifest (NASA Form 1269) shall clearly distinguish aircrew from passengers. [268] The remarks section of the NASA Form 1653 shall indicate what training and for whom the flight is being conducted. [269] NOTE: If minimum aircrew currency requirements have been met prior to the commencement of the flight for all of the aircrew assigned to a flight, aircrew training cannot be the primary purpose of a flight when carrying passengers.


**Figure 4-1 Mission Required Travel Where Passenger Transportation
Is the Primary Purpose of the Flight**


**Figure 4-2 Mission Required Travel Where Passenger Transportation
Is Not the Primary Purpose of the Flight**

4.4.4 For the approval process for Other Official Travel, refer to Figures 4-3 and 4-4. Travel by the following categories of people shall be authorized in advance, and in writing, when traveling aboard mission management flights on Other Official Travel, [270] and their status shall be annotated on the flight request and manifest:

- a. Senior Federal Officials.
- b. Members and families of such Senior Federal Officials.
- c. Non-Federal travelers. [271]

4.4.4.1 Senior Federal Officials are persons who meet one of the following definitions:

- a. Employed at a rate of pay specified in or fixed, according to 5 U.S.C., Chapter 53, Pay Rates and Systems.
- b. Employed in a position in an executive agency, including any independent agency, at a rate of pay for Level I of the executive schedule or employed in the Executive Office of the President (EOP) at a rate of pay for Level II of the executive schedule.
- c. Employed in a position in an executive agency that is not referred to in (a) above (other than a position that is subject to pay adjustment under Section 5.e of OMB Circular A-126, Improving the Management and Use of Government Aircraft) 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 for the senior executive service (SES) under Section 5382 of Title 5 of the U.S. Code.
- d. 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.
- e. Generally, these officials 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 SES. Active duty military officers are exempted from this definition.

4.4.4.2 Authorizations for Other Official Travel flights with Senior Federal Officials, families of such Senior Federal Officials, and non-Federal travelers aboard shall be:

- a. Reviewed in advance on a trip-by-trip basis by the Center's Chief Counsel. [272]
- b. Approved by the Center Director. [273]
- c. Reviewed by the NASA General Counsel. [274]

4.4.4.3 At NASA HQ, all flights shall be reviewed by the General Counsel and approved in advance by the Assistant Administrator for the Office of Strategic Infrastructure. [275] In special emergency situations, an after-the-fact written certification is permitted.

4.4.4.4 Other Official Travel flights on Center-assigned aircraft with no Senior Federal Officials aboard shall be reviewed by the Center's Chief Counsel and approved by the

Center Director without HQ review. [276]

☒

Figure 4-3 Approval Flow for Other Official Travel Without Senior Federal Officials, Families of Such Senior Federal Officials, or Non-Federal Travelers Aboard

☒

Figure 4-4 Approval Flow for Other Official Travel With Senior Federal Officials, Families of Such Senior Federal Officials, or Non-Federal Travelers Aboard

4.4.5 When a mission management flight is for Other Official Travel, the approving official shall determine that one of the following criteria has been satisfied:

- a. No commercial aircraft or airline service is reasonably available in accordance with paragraph 4.3.5a OR
- b. The actual cost of mission management flights does not exceed the cost of using commercial airlines or aircraft (including charter service). For such cost-justified flights, the cost of using commercial airline or aircraft services for justifying the use of Government aircraft shall:
 - (1) Be the current Government contract fare or price or the lowest fare or price known to be available for the trip(s) in question.
 - (2) Include any differences in the costs of any additional ground or air travel, per diem and miscellaneous travel (e.g., taxis, parking), and lost employee work time (computed at gross hourly costs to the Government, including benefits) between commercial air, charter air service, and Government aircraft. To capture the cost, including fringe benefits, of the employee's lost work time, a multiplier of 1.3285 must be applied to the locality-adjusted hourly salaries of the individual travelers for the additional travel time. The hourly salaries of the travelers are determined by dividing the applicable current average annual salaries, that are provided by the NASA Workforce Web site, by 2,087. Selecting the "Average Salaries by Occupation and Center (table)" view will provide access to the necessary data to determine average salaries by occupation and grade for each Center. While Federal salary data can be found at many other locations, the NASA Workforce Web site is the official NASA source. Travel time is defined as the time required to travel from the office or home until arrival at the business location or hotel, whichever is earliest. [277]

4.5 Responsibilities Associated with Mission Management Flight Operations

4.5.1 The Assistant Administrator for the Office of Strategic Infrastructure shall have the following responsibilities:

- a. Approving policies and other matters involving NASA mission management flights (except those specifically outlined above) and ensuring that the number of NASA-owned aircraft and their capacity to carry passengers and cargo does not exceed the level necessary to meet NASA's mission requirements. [278]
- b. Coordinating acquisition, assignment, or disposition of aircraft whose primary purpose is

the conduct of mission management flights with the appropriate Associate Administrators and Center Directors, in accordance with OMB Circular A-76, Performance of Commercial Activities. [279]

c. Annually reviewing mission management flight requirements, use, and associated costs, including variable cost rates for each aircraft used to conduct mission management flights. [280]

d. Periodically reviewing the need for all NASA aircraft whose primary purpose is mission management flight operations, and the cost effectiveness of NASA mission management flight operations, in accordance with the requirements of OMB Circular A-76. Each such review of NASA-owned aircraft whose primary purpose is mission management flight operations shall be submitted to GSA when completed and to OMB with NASA's next budget submission. [281]

e. Ensuring that current (by fiscal year) variable cost rate for each aircraft utilized to conduct mission management flights is used by all NASA officials who operate and account for NASA mission management flights to calculate the flight-by-flight cost justification required by OMB Circular A-126. [282]

4.5.2 Center Directors are responsible for the safe and efficient operation of mission management flights conducted by their assigned aircraft. Specifically, Center Directors shall:

a. Ensure that aircraft are used properly and that the functions, including contract functions, performed by their aircraft comply, at a minimum, with NASA, FAA, OMB, and other Federal requirements, policies, and procedures. [283] Center Directors may establish more restrictive local standards, where circumstances warrant, following coordination with the Assistant Administrator for the Office of Strategic Infrastructure.

b. Ensure compliance with 41 C.F.R., Part 101-37, and OMB Circular A-126. [284]

c. Approve the use of their assigned aircraft to conduct mission management flights where passenger transport is not the primary mission. [285]

d. Designate aircrew to conduct mission management flights and ensuring continuing compliance with all governing regulations. [286]

e. Establish variable cost rates for aircraft under their control that are, or may be, used for passenger transportation. The rate will be developed using OMB Circular A-126, Attachments A and B, incorporating the most recent 12 months of historical cost data available, and shall be used to determine the cost justification for mission management flight requests. The rate shall be reported to the HQ AD, not later than September 15 of each year, and cannot be used until approved by that office. [287]

f. Annually review and document the Center's continuing need for aircraft, whose primary purpose is the transport of passengers, and the cost-effectiveness of such aircraft operations, as required by OMB Circular A-126 and reflected in the NASA Financial Management Requirements and guidance from the HQ AD. Content of this review must include, in narrative format, a comparison of the past years' use with future requirements. Upon completion of the annual review, a copy shall be forwarded to the HQ AD, not later than October 31 of each year. [288] When Government ownership of an aircraft is no longer

justified, Center Directors shall identify such aircraft to the Assistant Administrator for the Office of Strategic Infrastructure for reassignment or disposal. [289]

g. Submit a monthly report of mission management flight data to the HQ AD to arrive not later than the 20th of the next month. This data must include all available mission management flight, request records for NASA aircraft under the control of the Center Director, and must reflect every flight flown by aircraft that has been, or may be, approved to transport passengers, regardless of whether the passengers were aboard that flight. At a minimum, the following shall be provided:

- (1) NASA Form 1653, Mission Management Flight Request.
- (2) NASA Form 1269, Flight Itinerary and Manifest.
- (3) Cost Calculation Spreadsheet.
- (4) NAMIS Form 1672, Aircraft Log. [290]

h. Certification documentation, demonstrating compliance with paragraph 4.3.5 for any nonofficial travel use and documentation of the required reimbursement described in paragraph 4.7, shall be included in the monthly mission management flight data submission. This responsibility may be delegated. [291]

4.5.3 The Director of the HQ AD is responsible for the following:

- a. Providing oversight, functional management, and direct staff support to the Administrator concerning Agency-wide policies, procedures, and guidelines for the management and conduct of mission management flights and Center compliance with NASA and OMB requirements.
- b. Developing and coordinating plans for the acquisition, assignment, and disposition of NASA aircraft whose primary purpose is passenger transport.
- c. Developing standard Agency-wide maintenance and operating requirements and policies, including minimum training and qualification requirements for aircrew and maintenance personnel.
- d. Coordinating periodic meetings with Center Aircraft Operations Chiefs and Maintenance Chiefs to review and update Agency-wide operations and maintenance requirements, policies, and procedures.
- e. In conjunction with the chair, IAOP, coordinating and participating in the conduct of operational reviews to ensure the adequacy and standardization of procedures, aircrew training and qualification programs, and aircraft maintenance and inspection programs at Centers operating mission management flights.
- f. Evaluating cost and utilization data for NASA aircraft used to conduct passenger transport.
- g. Providing an annual summary analysis of all cost and utilization data for mission management flight operations to the Assistant Administrator for the Office of Strategic Infrastructure.
- h. Providing Centers with guidance and assistance in the development of aircraft variable

cost rates for use in accomplishing cost comparisons.

- i. Reviewing and approving Center-derived variable cost rates for mission management flights.
- j. Maintaining a centralized database of mission management flight operations documentation to monitor usage, aircraft costs, and compliance with NASA and OMB requirements.
- k. Providing an annual report to the Assistant Administrator for the Office of Strategic Infrastructure on the quality of Agency-wide compliance with NASA and OMB requirements for mission management flight operations, no later than November 15 of each year.
- l. Conducting annual audits of Center mission management flight operations documentation.

4.5.4 The Inter-Center Aircraft Operations Panel

4.5.4.1 The IAOP performs Agency-wide coordination and communication to recommend requirements, policies, and operational improvements that can be used by the NASA Centers to improve local operations policies and procedures and, by the HQ AD, to improve Agency policies, procedures, and guidelines.

4.5.4.2 For each aircraft type used to conduct mission management flights, the IAOP chairperson may establish operations and maintenance subpanels with responsibility for standardizing aircrew and maintenance procedures, establishing aircrew and maintenance training/qualification standards, and conducting airworthiness reviews. For subpanels, the IAOP chairperson shall ensure the following:

- a. Subpanel members are Chiefs of Aircraft Operations and Chiefs of Aircraft Maintenance or their designees, as well as a representative from the HQ AD who shall act as permanent Executive Secretary. [292]
- b. Subpanels will be convened at least annually in formal meetings; however, the subpanels shall act as standing committees subject to call by the chairperson to review urgent business. Informal meetings may be conducted by teleconference. [293]
- c. Subpanels, with the IAOP chairperson's concurrence, will forward their recommendations through the HQ AD to the Assistant Administrator for the Office of Strategic Infrastructure for final approval.
- d. Headquarters-approved recommendations will be considered directive in nature and be reflected in NASA policy documents.

4.5.5 Flightcrew members

4.5.5.1 Maintaining the highest standards of safety is the primary concern of all crewmembers. Other concerns, such as passenger service, courtesy, promptness, and reliability are important, but must always be secondary to safety. All crewmembers shall comply with the provisions set forth in this NPR, and with FAA and OEM publications, for their aircraft and other applicable directives, regulations, and instructions. [294]

4.5.6 Pilot in Command. A fully qualified pilot shall be designated as PIC and charged with the responsibility of conducting each NASA mission management flight. [295]

4.5.6.1 The PIC is responsible for exercising complete authority, without limitation, over the command and supervision of assigned crewmembers during flight and crew duty time.

4.5.6.2 The PIC is solely responsible for accomplishing the mission assigned to the aircraft, for all facets of its operations, and for exercising final authority over the safety of the aircraft and its passengers. The PIC will make the decision to delay or divert a flight for operational reasons such as weather, aircraft conditions, or pilot fatigue. The PIC will not be overruled by other persons embarked. A decision by the PIC to delay or divert a flight for the above reasons or based on safety concerns will not be the basis for disciplinary action.

4.5.7 Second in Command (SIC). The pilot assigned to duty as SIC during flight shall be qualified as either a PIC or SIC, as specified in paragraph 4.11.4. [296] It is the SIC's responsibility to assist the PIC and to be able to assume command in the event of the PIC's absence or incapacitation.

4.5.7.1 A SIC may, at the discretion of the PIC, fly from the left seat or right seat on missions (such as ferry or training missions) when no passengers are on board. A SIC will not make takeoffs or landings from either seat with passengers on board. However, Center's Chiefs of Flight Operations may grant, in writing, authority for a PIC to allow a SIC to execute landings with passengers aboard. The final approval authority for such operations remains with the PIC for each flight.

4.6 Reporting Requirements

4.6.1 The HQ AD will ensure strict compliance with the following reporting requirements:

4.6.1.1 NASA's aircraft programs shall be included in NASA's Management Control Plan and comply with the internal control requirements of OMB Circular A-123. [297] Any material weaknesses found shall be reported in the next annual internal controls report to the President and Congress. [298]

4.6.1.2 OMB Circular A-76 reviews will be completed when required and submitted to GSA and OMB with the Agency's next budget submission. These reports will include plans for disposition of any aircraft not justified in the review or the identification of such additional aircraft, as may be required.

4.6.1.3 On a semiannual basis, NASA reports to GSA on each mission management flight for "Other Official Travel" by Senior Federal Officials, staff of the Executive Office of the President, members of the families of such officials, and any non-Federal travelers. Such reports will be in a format as specified by GSA and list all such travel conducted during the preceding 6-month period. The report must include, at a minimum:

- a. The name of each such traveler.
- b. The official purpose of the trip.
- c. Destination(s).

d. For travel in which the report stated that a mission management flight would be less expensive than a commercial carrier, the allocated share of the full operating cost of each trip and the corresponding commercial cost for the trip. (Reports on classified trips will not be reported to GSA, but must be maintained by the Agency (using the mission management flights) and must be available for review as authorized.)

4.6.1.4 Records of all mission management flight operations shall be retained for at least 2 years and must include, at a minimum:

- a. The tail number of the plane used.
- b. The date(s) used.
- c. The name(s) of the pilot(s) and flightcrew.
- d. The purpose(s) of the flight.
- e. The route(s) flown.
- f. The names and status of all passengers on all legs of the mission. [299]

4.6.1.5 When mission management flights are used to support Other Official Travel, evidence that the applicable provisions of OMB Circular A-126 have been satisfied is required.

4.6.2 Center Directors shall ensure strict compliance with the following reporting requirements:

- a. Monthly submission of mission management flight data to the HQ AD, as required in paragraph 4.5.2.7. [300]
- b. Annually reviewing and documenting the Center's continuing need for aircraft, whose primary purpose is the transport of passengers, and the cost-effectiveness of such aircraft operations, as required by OMB Circular A-126 and reflected in the NASA FMR and guidance from the HQ AD. Content of this review is to include, in narrative format, a comparison of the past years' use with future requirements. Upon completion of the annual review, a copy will be forwarded to the HQ AD, not later than October 31 of each year. [301]
- c. Establishing variable cost rates for each fiscal year for aircraft under their control that are, or may be, used for passenger transportation. This rate is to be used to determine cost justification for mission management flight requests and shall be reported to the HQ AD, not later than September 15 of each year. [302]
- d. The variable rate will be developed per OMB Circular A-126, Attachments A and B, using the most recent 12 months of historical cost data available. The Center variable rate shall be approved by HQ AD prior to being applied at the beginning of each FY. [303] If, during the fiscal year, a Center needs to adjust the variable rate, substantiation shall be submitted and approved prior to being applied. [304]

4.7 Reimbursement for Nonofficial Travel Use

4.7.1 Reimbursement for nonofficial travel use shall be made in advance of the flight for travel on FAA aircraft, consistent with current FAA procedures. [305]

4.7.2 Reimbursement for nonofficial travel use of NASA-owned or -controlled aircraft shall be made in advance of the flight. [306] Travelers aboard such flights must reimburse the Agency at the full commercial coach fare for the most direct route possible between the origin and destination, except: (a) as authorized under 10 U.S.C., § 2648, Persons and Supplies: Transportation, and regulations implementing the statute and (b) by civilian personnel and their dependents in remote locations (i.e., locations not reasonably accessible to regularly scheduled commercial airline services).

4.7.3 Reimbursement will consist of a noncash payment by personal check made payable to NASA for the amount as determined by the local NASA Travel Office. The check will be submitted to the Customer Payment Processor in the Center's Accounts Receivable Office. Receipt of the reimbursement will be fully documented and attached to the Mission Management Flight Request, NF 1653. Any flight involving nonofficial travelers shall require notification to the HQ AD, prior to the flight, to ensure application of the Agency-wide procedures for reimbursement. [307]

4.8 Operations

4.8.1 NASA mission management flights are public aircraft, as defined by 49 U.S.C. § 40102, Definitions, but are operated as civil aircraft when carrying passengers.

4.8.2 NASA aircraft used to conduct mission management flights shall meet the FAA certification standards required of mission management flights. [308]

4.8.3 Airworthiness of NASA mission management flights shall, at a minimum, meet the standards set forth in the Federal Aviation Regulations for similar business-type aircraft. [309] Aircraft whose primary or secondary purpose is the transport of passengers shall be maintained, as required, for retention of FAA airworthiness certification. [310]

4.8.4 The cost of operation and the utilization of mission management flights shall be reported in accordance with Financial Management Manual 9353-6 (RCS-10-0000-00271) and OMB Circular A-126. [311]

4.9 Use of NASA Aircraft for Mission Management Flight Purposes

4.9.1 NASA-owned and -controlled aircraft, including lease and charter, whose primary purpose is to meet other mission requirements of research or program support, are public aircraft and are not authorized to carry passengers (even if the classification of the flight is Mission Required) without written approval from the Assistant Administrator for the Office of Strategic Infrastructure prior to such use. Approval shall be coordinated with the HQ AD. [312] Once approval for such use has been obtained, Center Directors may approve Mission Required flights on those specifically authorized aircraft, subject to the reporting procedures

of this chapter and the letter of authorization. Absent such specific authorization, personnel aboard aircraft operated as public aircraft is limited to crewmembers or qualified non-crewmembers. The use of a NASA aircraft to provide passenger transportation shall be restricted to circumstances where such use does not conflict with program support or research operations. [313] Strict compliance with this chapter and with OMB Circular A-126 is mandatory. Such use will only be approved subject to the following:

- a. When using a NASA aircraft for mission management flights, the aircraft must be in a valid FAA-certificated configuration.
- b. When mission management flights are not readily available or when such use would be impractical; e.g., when using an available mission management flight would create excessive empty flights--deadheading--or would exceed crew duty restrictions.
- c. The same cost comparisons required for mission management flights, as required by paragraphs 4.1 through 4.4.
- d. When such use has been approved by the Center Director and the Assistant Administrator for the Office of Strategic Infrastructure.

4.9.1.1 Centers shall document the justification for and approval of each flight used for mission management purposes and retain the documentation for 2 years. [314] Additionally, every flight in such aircraft, including flights without passengers, must be accounted for in monthly documentation provided to the HQ AD as described in paragraph 4.6.2a.

4.10 Waivers and Supplements

4.10.1 Waivers. When deviations from this NPR are necessary, Center Directors shall submit requests for deviations or waivers to the Assistant Administrator for the Office of Strategic Infrastructure. [315] Written approval is required before implementing procedures that are less restrictive than those contained in this NPR.

4.11 Flightcrew Qualifications

4.11.1 Designation. Prior to assigning personnel to flightcrew duties on NASA mission management flights, the requirements contained in this chapter must be met. The crewmember must be designated, in writing, to the respective crew position, and required training must be completed and documented in the individual's training file.

4.11.2 Training File. A training file shall be maintained for each flightcrew member. [316] This file must contain all documentation pertaining to crew qualification and training. The documents may be retained by the crewmember upon termination of the crewmember's assignment. At a minimum, the file will contain the following documentation:

- a. Copies of certificates of professional and medical qualifications; e.g., copies of pilot's, flight engineer's, or mechanic's licenses and a copy of the letter designating the individual to the current crew position.
- b. A list of ground training accomplishments (including simulator training) indicating dates,

location, and amount of training. A record of refresher training must be maintained for the past 2 calendar years.

c. A list of flight training accomplishments and flight evaluations for the past 2 calendar years.

4.11.3 Medical Prerequisites. Pilots of aircraft used for mission management flights shall possess a current FAA First Class Medical Certificate. [318] Flight Maintenance Technicians shall possess a valid FAA Third Class Medical Certificate or NASA medical certificate issued within the past 12 months by a NASA-approved medical examiner. [317] Examinations conducted by non-NASA Aircrew Medical Examiners (AME) will require a records review by a NASA Occupational Health Clinic physician prior to recommendation to the Center Director.

4.11.4 PICs/SICs shall possess an FAA Airline Transport Pilot (ATP) Certificate with appropriate category, class, and type rating in the aircraft assigned. [319] To be designated an aircraft commander, the pilot shall meet the following minimum flight experience requirements:

- a. 2,500 pilot hours (500 hours multi-engine).
- b. 100 pilot hours in type. [320]

4.11.5 Instructor pilots shall be selected by the Center's Chief of Flight Operations from highly qualified PICs who have demonstrated the skill, maturity, and temperament to perform instructor duties. [321] Instructor pilots will conduct all pilot flight checks unless the Center designates flight examiners for that purpose.

4.11.6 Flight Examiner Pilots/Flight Examiner Maintenance Technicians. Centers may designate highly qualified instructor pilots and flight maintenance technicians as flight examiners to fulfill Center evaluation requirements.

4.11.7 Flight maintenance technicians shall possess an FAA A&P Certificate. [322]

4.12 Crewmember Training

4.12.1 The mission management training program is established to ensure that each crewmember is adequately trained to perform assigned duties safely and proficiently. To the extent practical, procedures training should be standardized for each type of mission management flight.

4.13 Ground Training

4.13.1 Survival Training. Each primary crewmember shall receive basic survival training on a one-time basis. [323] Additional survival training shall be required by appropriate Center management for those crewmembers engaged in frequent over-water or remote-area flights. [324] Training received prior to NASA employment, such as military survival training courses, may be credited for this requirement. Newly assigned personnel with no previous survival training shall complete this requirement within 12 months of being assigned to

flightcrew duties. [325] Pilots shall not be assigned as PICs until this requirement has been met. [326]

4.13.2 Physiological Training. Prior to initial designation, primary crewmembers shall receive instruction in the physiological aspects of high-altitude flight, including altitude chamber indoctrination or recognized equivalent training; i.e., Reduced Oxygen Breathing Device training. [327] Altitude chamber training received prior to initial designation meets this requirement. Refresher training academics shall be accomplished every 5 years. [328] Refresher altitude chamber training is optional for primary crewmembers not conducting pressure suit operations.

4.13.3 Emergency Egress Training. Prior to initial designation and annually thereafter, each crewmember shall receive emergency egress training on each type of aircraft assigned. [329] Training shall include instructions on the location and operation of normal and emergency exits and cabin emergency equipment, such as fire extinguishers and life vests. [330]

4.13.4 Aircraft Initial Training. Each primary crewmember shall complete an approved formal course of instruction in the type aircraft to be flown, including a study of the systems and procedures applicable to the individual's crew position. [331] The term "formal course" is defined as one that is provided by a manufacturer, a commercial activity specializing in pilot training (14 C.F.R § 142, Training Centers), or other entity approved by the Center's Chief of Flight Operations.

4.13.5 Refresher Training. A formal systems training course shall be required every 6 months for pilots and every 18 months for flight maintenance technicians. [332] The course must consist of a minimum of 7 hours of academic training. At the discretion of the Center's Chief of Flight Operations, a 7-hour local refresher ground training course may be substituted for one of the two annual formal systems training courses for highly experienced pilots who are qualified in multiple aircraft and attend multiple emergency procedure training sessions annually or who are single-aircraft qualified and have at least 3 years and 300 hours of experience in the specific aircraft type.

4.13.6 Maintenance Technicians shall attend refresher training that addresses changes to aircraft systems, test equipment, or critical troubleshooting and repair techniques every 24 months. [333]

4.14 Flight Training Phase

4.14.1 Flight training is designed to provide crewmembers with hands-on experience under controlled conditions. Flight training shall be conducted under the supervision of a NASA-designated flight instructor pilot or an FAA-certified flight instructor, either in an approved simulator or in an aircraft. [334] Flight training, except that which is associated with transportation procedures, will not be conducted while passengers are on board.

4.14.2 Initial Pilot Training. Prior to initial designation, each pilot shall receive a minimum of 10 hours of flight training, 8 hours of which may be conducted in a simulator. [335]

4.14.3 Refresher Pilot Training. In each 6-month period, pilots shall receive a minimum of 6 hours of flight or simulator training. [336] At least one-half of this training must be

completed in the pilot's (left seat) position. Because of the safety and efficiency provided by modern visual simulators, maximum use should be made of these facilities to meet this training requirement. With the approval of the Center's Chief of Flight Operations, one of the semiannual flight or simulator training requirements may be waived for pilots with 3 years and 300 hours of experience in type and for temporary pilots serving in SIC capacity. This can be done only after all other applicable requirements of this NPR have been met and the temporary pilot successfully completes a proficiency and instrument proficiency check in type given by a designated NASA flight instructor.

4.14.4 Flight Maintenance Technician Training. Maintenance technicians perform in-flight duties involving passenger safety aboard certain NASA aircraft, such as Gulfstream aircraft. Prior to initial designation, each maintenance technician shall receive training in such areas as traffic awareness and "see-and-avoid" techniques, aircraft servicing, weight and balance, and passenger care. [337] This training may be conducted on a regular passenger mission under the supervision of a fully qualified flight maintenance technician or aircraft commander. Initial training will consist of at least two passenger missions. One mission must include an overnight stop away from the home duty station.

4.15 Overdue Training

4.15.1 With the exception of systems and simulator training, which have a 2-month grace period, refresher flight training will be considered overdue if not completed by the end of the month in which it is due. Only crewmembers who have completed their required training shall be used as required crewmembers on any passenger missions. [338]

4.16 Minimum Currency Requirements

4.16.1 All flight crew currency documentation shall be recorded in the NASA standard application, NASA Aircraft Management Information System (NAMIS). [339]

4.16.2 Minimum Requirements. In the interest of flight safety and to ensure that all crewmembers have the opportunity to exercise their aeronautical skills and, thereby, maintain the proficiency level for which they have been trained, the following minimum currency requirements shall be met: [340]

4.16.2.1 Pilots. Table 4-2 sets forth the minimum currency requirements for pilots:

Table 4-2 Minimum Currency Requirements for Pilots

Minimum Currency Requirements for All Pilots in the Preceding 90 Days		
	All Types	In Type
Flight Hours	25	
Takeoffs and Landings (Total)	6	3

Takeoffs and Landings (Night)	3	1
Approaches	6	3
Notes:		
<ol style="list-style-type: none"> 1. Requirements under All Types are not limited to mission management flights. 2. Total Flight Hours may include simulator hours. 3. Instrument hours, approaches, takeoffs, and landings (including night takeoffs and landings) may be accomplished in an FAA- or military-approved (Level C/D) simulator. Approaches must include both precision and nonprecision types. 		

a. Pilots with current qualifications in a NASA aircraft that is also FAA-certified for mission management use, but that is infrequently used for that purpose, may perform the duties of PIC and SIC on that aircraft if they meet the stated currency. At Centers that operate multiple higher performance aircraft than those used for mission management and where such aircraft have annual or semiannual simulator and other similar requirements (night landings, approaches, and hours), pilots will be considered to have met the recent experience requirements.

b. Total pilot/copilot hours may include simulator hours.

c. Instrument hours, approaches, and landings (including night landings) may be accomplished in an approved visual, motion simulator. Approaches should be evenly balanced between precision and nonprecision.

d. Private pilot time shall not be recorded in NASA information systems or utilized to meet any of the above currency requirements. [341]

4.16.2.2 Flight Maintenance Technicians. To maintain currency, flight maintenance technicians shall have flown at least three passenger missions each calendar quarter, or they must be accompanied by a current flight maintenance technician. [342]

4.17 Overdue Recent Experience

4.17.1 The following apply to pilots overdue for the recent experience provisions of Table 4-2:

4.17.1.1 Increased Minimums. A pilot at the controls who does not meet the 90-day total hour requirements, but is otherwise current, shall increase all instrument approach minimums by 200 feet and one half mile visibility (or the Runway Visual Range equivalent). [343] In no case may the resulting minimums be less than a 400-foot ceiling and 1-mile visibility.

4.17.1.2 Step-Down Qualifications. PICs who are otherwise current but fail to meet the requirements outlined in Table 4-2 may revert to SIC status (if they are current in their respective positions) until the recent-experience provisions for aircraft commander are satisfied.

4.17.1.3 Multiple Currency. At the discretion of the Chief Pilot, pilots flying multiple types of aircraft who have met the all-types requirements may satisfy the in-type currency requirement by flying a training flight with a flight instructor. This training flight shall include a minimum of two instrument approaches, three takeoffs, and three landings. [344]

4.17.1.4 Night Landing Currency. Pilots not meeting the night-landing currency requirements of Table 4-2 cannot conduct night landings with passengers on board, but may be otherwise utilized until the night-landing requirements are satisfied. Night-landing requirements may be accomplished in an approved visual simulator.

4.17.1.5 Lapse in Qualification. Crewmembers overdue in any recent-experience requirement, except as modified above, are disqualified for assignment as PIC or SIC on passenger flights. A lapse in qualification of up to 90 days requires requalification in items that are deficient or require a proficiency flight check with an instructor pilot. Lapse in qualification greater than 90 days shall require retraining of at least 6 hours of dedicated flight or simulator training as determined by the Center's Chief of Flight Operations and requires a formal flight evaluation by an instructor pilot. [345]

4.18 Evaluation Phase

4.18.1 Evaluations. The intent of the NASA flightcrew evaluation program is to objectively evaluate aircrew performance and, thereby, measure the effectiveness of the training program. Designated instructor pilots (IPs) shall administer all flight checks. [346] An IP shall be designated for all flights in which instruction or evaluation is planned. [347]

4.18.2 Annual Proficiency Check. Prior to being designated in their crew position, and annually thereafter, pilots shall complete a proficiency evaluation flight conducted by a NASA-designated IP or an FAA-designated flight IP. [348] When maintaining qualifications in more than one type of aircraft, an annual proficiency evaluation flight in each aircraft is required. Except for the initial check, proficiency checks may be accomplished in an approved simulator by a NASA IP or an FAA-designated examiner. Flight checks are considered overdue if not completed by the end of the month in which they are due. Pilots with overdue proficiency checks shall be scheduled only on training flights (i.e., non-passenger flights) with an instructor pilot. [349]

4.18.3 Line Checks. Prior to being designated an aircraft commander, and annually thereafter, pilots shall complete a line evaluation flight conducted by an IP. [350] When maintaining qualification in more than one type of aircraft used for mission management flights, a line evaluation in each aircraft is required annually. The annual line check requirement may be conducted on typical passenger missions or in a Line Oriented Flight Training (LOFT) program in an approved simulator. Pilots with overdue line checks shall not be scheduled as a PIC until a check is completed. [351]

4.18.4 Documentation. Flight checks conducted by a NASA IP shall be recorded on NASA Form 1615 or Center equivalent, reviewed by the Center's Chief of Flight Operations, and filed in the individual's training file. [352] All items indicated on the Form 1615 or Center equivalent will be evaluated during the flight checks. Flight instructors are urged to include meaningful remarks and recommendations on the check ride form. This will aid in focusing

future training.

4.19 Coordination and Scheduling

4.19.1 In addition to approving the use of mission management flights, the Assistant Administrator for the Office of Strategic Infrastructure and the Center Directors shall:

- a. Ensure that the most cost-effective aircraft is used to satisfy approved requirements. Exceptions to this usage shall be documented in writing. [353]
- b. Coordinate trip itineraries and requirements with other NASA activities that could benefit from the use of available seats on each trip. [354]

4.20 Crew Complement

4.20.1 General. All personnel scheduled as primary flight crewmembers on NASA mission management flights shall be trained and qualified in accordance with this chapter. [355] Crew assignment, including identification of a PIC, shall be designated in writing for each flight. [356]

4.20.2 Basic Crew. No aircraft carrying passengers shall be operated with less than the minimum basic crew specified below. [357] Exception: G-II/III aircraft may be operated with three pilots, one of whom functions as the Flight Maintenance Technician, or the flight may be operated without a flight maintenance technician at the direction of the Center's Chief of Flight Operations.

- a. Gulfstream II/III – PIC and SIC. Flight Maintenance Technician (optional).
- b. King Air B200 – PIC and SIC.

4.21 Crew Duty Time

4.21.1 Crew duty time is the total time a crew is on duty before the final termination of a flight. Crew duty time accrues consecutively and begins when a crew reports to a designated place of duty to start preparation for a flight and ends when the engines are cut at the end of the flight or series of flights. Using personnel as crewmembers who commenced other duties before reporting for a flight is not precluded. However, in this case, the crew duty time for the entire crew begins when those other duties commenced.

4.21.2 Duty Time Limitations. Basic crew duty time shall not be scheduled to exceed 14 consecutive hours, except as set forth below. [358]

4.21.2.1 The Center's Chief of Flight Operations may, for a particular flight, extend the basic crew duty time to 16 hours if the total time of crew duty is confined to the period between 4 a.m. and midnight (local time at departure point). The aircraft must be pressurized and have a functional autopilot.

4.21.2.2 Augmented crews will be used only as a last resort when all other options, such as

rescheduling or pre-positioning other crews, are not possible. Consideration must be given to limiting passenger load to ensure that an adequate crew rest capability is available.

Augmented crew duty time shall not be scheduled to exceed 18 consecutive hours. [359] The aircraft must be pressurized and have a functional autopilot. Flights requiring augmentation shall be approved by the Center's Chief of Flight Operations and documented and maintained on file for a period of 12 months. [360]

4.21.2.3 Relief crews shall be pre-positioned if the mission schedule cannot be supported within the duty time limitations specified for a single or augmented crew. [361]

4.22 Crew Rest

4.22.1 Crew Rest Definition. Crew rest includes crew transportation prior to participating in flightcrew duties and will be provided prior to departure from the home station as well as at en route stops when mission schedule or crew duty limitations prevent the aircraft from returning to the home station.

4.22.2 Crew Rest Limitations

4.22.2.1 Crew rest shall normally provide at least 10 consecutive hours free of all official duties. [362]

4.22.2.2 At en route stops, crew rest shall not commence until 1 hour after termination of the mission in order to allow for necessary post-flight duties. [363]

4.22.2.3 The crew rest period shall end 1 hour prior to the crew beginning official duties in preparation for departure, normally at least 1 hour prior to scheduled takeoff time. [364]

4.22.2.4 The Center's Chief of Flight Operations may approve a reduced crew rest of no less than 8 hours total ground time, provided this time is confined to between the hours of 8 p.m. and 8 a.m. local time. Approvals for reduced crew rest shall be limited to one occurrence per crewmember during any 7-day period. [365] Such approvals shall be documented and maintained on file for a period of 12 months. [366]

4.22.2.5 Time accrued by any flightcrew member traveling as a passenger on an aircraft may not be credited to meet any of the crew rest requirements of this chapter.

4.23 Maximum Flight Time Limitations

4.23.1 Flightcrew members shall not be scheduled, nor permitted, to function as members of mission management flightcrews, if their total professional flying time exceeds the following flight hours in Table 4-3: [367]

Table 4-3 Maximum Flight Time Limitations

Period	Flight Hours
7 consecutive days	35 hours

30 consecutive days	100 hours
90 consecutive days	300 hours
365 consecutive days	1,000 hours

4.24 Hazardous Cargo

4.24.1 Hazardous material, as defined in 41 C.F.R § 105.5, Definitions, shall not be transported aboard mission management flights. [368] Cargo to be shipped shall be routed through the Center's transportation office before acceptance or, if en route, cargo normally only shall be accepted from a certified shipper or freight-forwarding agency. [369] Unaccompanied baggage will be treated as cargo.

4.25 Sterile Cockpit Procedures

4.25.1 During all critical flight operations, cockpit activities and conversation shall be limited to those involved with the direct operation of the aircraft. [370] This Sterile Cockpit environment must be maintained when below 10,000 feet above ground level (AGL) during approach and departure, except during prolonged cruise at an altitude below 10,000 feet AGL.

4.26 Crew Briefings

4.26.1 Before departure, the PIC shall brief the crew on all essential information concerning the flight, including weather, restrictions, and the duties and responsibilities of each flightcrew member. [371]

4.27 Flight Planning Considerations

4.27.1 Passenger Loading. Normally, all engines and propellers will be completely stopped when loading and unloading passengers or cargo from mission management flights. In those instances when, in the determination of the PIC, an extenuating circumstance requires loading or unloading passengers or cargo with an engine running, the following minimum precautions shall be followed:

- a. Only the engine on the opposite side of the aircraft from the loading door shall be operating and shall be operated at as low a power setting as practical. [372]
- b. A flightcrew member shall be positioned on the ground to ensure that passengers do not approach close to an operating engine or windmilling propeller. [373]

4.27.2 Passenger Briefings. The PIC shall ensure that all passengers have been briefed on the Disclosure for Persons Flying Aboard Federal Government Aircraft (see Appendix C-2). [374] In addition, the briefing will include the no smoking policy, use of seat belts, location

and operation of emergency and survival equipment, operation of doors and exits, and any other Federally required information. This information will be supplemented by printed passenger information cards. Prerecorded passenger briefings may be used, provided the sound reproduction is of high quality and a crewmember is present in the cabin during the briefing to answer passenger questions.

4.27.3 Flight Planning. Thorough flight planning is essential to the safe and efficient conduct of mission management passenger flights. A flight plan shall be filed for each flight. [375] Passenger flights shall be operated under instrument flight rules and, to the maximum extent possible, in controlled airspace. However, daylight flights of less than 100 nautical miles may be operated under visual flight rules if weather conditions permit. [376] These flights should utilize radar advisory service to the maximum extent possible.

4.27.4 Fuel Planning. Considering weather forecasts and any known en route delays, the minimum amount of useable fuel required at takeoff shall be sufficient to do the following:

- a. Complete the flight to the destination airport.
- b. Fly from that airport to the alternate airport, if required.
- c. Fly after that for one additional hour using cruise fuel consumption at 10,000 feet mean sea level (MSL). [377]

4.27.5 Weather Planning. Prior to takeoff, the PIC shall receive a thorough weather briefing concerning current weather and forecasts for the proposed route, destination, and alternate destination. [378]

4.27.5.1 Departure Weather. Weather minimums for takeoffs shall be not less than landing minimums unless a takeoff alternate is available. [379] A takeoff may be made when the weather is below landing minimums but not less than 1/8-mile visibility or Runway Visual Range (RVR) of 800 feet and provided a suitable departure alternate is available within 30-minutes flight time with an engine inoperative. The weather reported at the departure alternate must be above landing minimums and forecast to remain so for at least 2 hours after takeoff, per the following:

- a. Precision Approach available: 200-foot ceiling and 1/2-statute mile (SM) visibility added to the published Precision Approach minimums.
- b. Non-Precision Approach (only) available: 300-foot ceiling and 1-SM visibility added to the published Non-Precision Approach minimums.

4.27.5.2 En Route Weather. The following requirements with regard to en route weather are to be met:

- a. The PIC of a mission management flight shall not file a flight plan requesting clearance into areas of reported or a forecast of severe icing conditions. [380]
- b. Airborne radar shall be operative for any flight into areas where current weather reports or forecasts indicate that thunderstorms may reasonably be expected, and flight under daylight visual meteorological conditions is not possible. [381]
- c. All flights shall be planned to circumnavigate areas of thunderstorm activity. [382]

4.27.5.3 Destination Weather. The PIC of a mission management flight may file for a destination that forecasts prevailing visibility equal to or greater than published landing minimums appropriate to the aircraft equipment, but not less than 1/2-mile or an RVR of 1,800 feet for time of arrival. Also:

- a. If the destination weather is reported and forecast to be less than a 2,000-foot ceiling or less than 3-mile visibility from 1 hour before, until 1 hour after, the estimated time of arrival (ETA), an alternate airport shall be listed on the flight plan. [383]
- b. Airport weather minimums shall meet or exceed the requirements of FAR Part 91. [384]

4.27.6 New PIC. When the pilot has less than 100 hours PIC experience in the type (make and model) aircraft being operated, the minimum descent altitude (MDA) or the Decision Altitude (DA) and visibility landing minimums shall be increased by 200 feet and 1/2 mile (or the RVR equivalent) for all instrument approaches conducted by that pilot. [385] In no case shall the landing minimums be less than a 400-foot ceiling and 1-mile visibility. [386] Similarly, takeoffs shall not be made if the airfield is below these adjusted landing minimums. [387]

4.27.7 Aircraft Logs. Prior to activating any aircraft system, aircraft maintenance forms shall be reviewed and evaluated. [388] Prior to flight, the PIC shall accept the aircraft by signing the form. DoD aircraft forms, NASA Aircraft Management Information System (NAMIS), or equivalent forms may be used as a substitute for specific NASA forms. [389]

4.27.8 Weight and Balance Data. A copy of the current weight and balance data shall be carried aboard each mission management flight. [390] It is used to determine that the weight and center of gravity remain within limits for the duration of each flight.

4.28 Takeoff and Departure Procedures

4.28.1 Departure. On departure, navigational aids (NAVAIDS) shall be set up to aid in a possible expedited emergency return, as well as to aid in establishing the initial en route course. [391]

4.28.2 Cockpit Voice Recorder (CVR) and Flight Data Recorder (FDR). If installed and operative, the CVR and FDR shall be turned on during the entire flight. [392] Should an incident occur, the CVR and FDR power shall be removed and appropriate circuit breakers pulled following completion of the after-shutdown checklist. [393]

4.28.3 Enhanced Ground Proximity Warning System (EGPWS)/ TAWS. EGPWS/TAWS shall be used on all flights. [394] If the equipment tests satisfactorily prior to takeoff, it must be assumed that any EGPWS/TAWS warning is valid unless the aircraft position can immediately and positively be verified by visual reference. Immediate and appropriate action shall be taken in response to all valid EGPWS/TAWS warning calls. [395]

4.28.4 Landing Lights. Landing lights shall be used during all takeoffs and landings and when operating near airports or in high-density traffic areas. [396]

4.28.5 Outside Vigilance. The PIC is responsible for ensuring that, during visual conditions,

at least one person maintains a lookout for conflicting traffic at all times. Unnecessary paperwork will not be accomplished in the cockpit during aircraft climbs or descents.

4.28.6 Outside Observers. Use of any additional crewmembers to aid in outside vigilance is highly encouraged, particularly while operating in visual conditions in heavy traffic areas. Flight Maintenance Technicians shall remain at their duty station throughout the climb and descent. [397] Their cabin duties are considered secondary in importance during these times.

4.28.7 Traffic Alert and Collision Avoidance System (TCAS) resolution advisories (RA) shall be followed. [398]

4.29 En Route Procedures

4.29.1 Passenger Considerations. The PIC is responsible for the safety and comfort of the passengers and must make every reasonable effort to keep the senior passenger or trip coordinator apprised of any significant deviations from the itinerary or schedule. In-flight delays and readily discernible abnormal conditions shall be explained to the passengers. [399]

4.29.1.1 Safety Belts. The PIC shall require that all passengers and crewmembers have safety belts securely fastened for taxiing, takeoffs, landings, and before entering an area of in-flight turbulence. [400]

4.29.1.2 Admission to the Flight Deck. Passengers shall not be admitted to the flight deck during sterile cockpit phases of flight. [401]

4.29.2 Minimum Fuel. The PIC shall notify ATC of the aircraft's minimum fuel status at any time the fuel supply has reached a quantity where, upon reaching destination, little or no delay can be accepted. In no case may this quantity be less than that specified in Table 4-6. [402] If fuel remaining indicates a need for traffic priority to ensure a safe landing, the PIC shall formally declare an emergency due to low fuel and shall report fuel remaining in minutes. [403]

4.29.3 Emergency Procedures. When an emergency or in-flight difficulty arises, the crew shall complete the checklists and report the nature and extent of the difficulty, intentions, and assistance required to the controlling ground agency. [404] In the event of an engine failure or shutdown, the aircraft shall land at the nearest suitable airport at which a safe landing can be made. [405]

4.30 Arrival, Approach, and Landing Procedures

4.30.1 General. During instrument arrivals, all available navigational aids shall be used. When available, precision approach guidance (Instrument Landing System or Precision Approach Radar) will be used for all night arrivals except for specific events during training flights. [406]

4.30.2 Weather Minimums. Pilots operating aircraft shall land the aircraft only when the flight visibility is equal to or greater than the visibility prescribed in the standard instrument

approach procedure being used. [407]

4.30.3 Destination Below Minimums. If the destination weather is marginal or below minimums, the PIC may proceed to a suitable alternate or may hold if the destination weather is forecast to improve and fuel for alternate and reserve requirements will not be compromised. The weather at the alternate must be at or above alternate minimums and forecast to remain so until the new ETA plus one hour.

4.30.4 Approach Briefing. Before starting an approach, the pilot flying shall brief the crew on the procedures to be followed during the approach and landing and in the event of a missed approach. The briefing will include a review of the procedures, including key altitudes and restrictions, as well as specific crew duties during the approach and landing. [408]

4.30.5 Approach. The following procedures will be followed during approach:

- a. The pilot shall set up to execute a stabilized approach to landing. The optimum stabilized approach is defined as a flight on the glide path (visual or electronic) at a steady rate of descent, on the target approach speed, in the landing configuration, in trim, and with the proper thrust setting. [409]
- b. A stabilized approach shall be established by 1,000 feet above airport elevation in instrument meteorological conditions (IMC) and by 500 feet above airport elevation in visual meteorological conditions (VMC). [410]
- c. The pilot flying the approach shall announce his/her progress and intentions periodically. [411]
- d. The pilot monitoring shall observe the approach and provide a continual cross-check of the navigational aids, instruments, air traffic control instructions, and approach procedures. [412]
- e. Any deviations from the prescribed procedure shall immediately be brought to the attention of the pilot flying. [413]
- f. The pilot monitoring shall call out “1,000 feet above” and “100 feet above” all key altitudes, as well as minimums upon reaching the Missed Approach position. [414]
- g. When the runway is in sight, the pilot monitoring shall state, “runway in sight.” [415]
- h. If the runway is not in sight when the aircraft reaches the Missed Approach point, the pilot monitoring shall state, “go around.” [416]

4.30.6 Use of Autopilot. Use of the autopilot during arrivals, descents, and approaches is encouraged, particularly during visual flight conditions, as an aid in collision avoidance. To prevent excessive loss of altitude in the event of an autopilot failure, the pilot directing the aircraft shall maintain flight control contact throughout the final portion of an automatic coupler approach. Full manual control shall be assumed at or above published minimum altitude. Pilots shall observe all cautions on use of autopilots in icing. [417]

4.30.7 Canceling Instrument Flight Plans. Normally, instrument flight plans will not be canceled prior to landing.

4.31 Post-flight Procedures

4.31.1 Closing Flight Plan. On completion of the flight, the PIC shall ensure that the flight plan is closed with the appropriate facility. [418]

4.31.2 Aircraft Security. The PIC shall take prudent measures to secure and protect the aircraft at en route stops. [419] These measures should prevent unnecessary exposure to inclement weather, such as high winds and freezing precipitation, and also provide a reasonable degree of security from such activities as vandalism, theft, or terrorism. State Department Advisories and the DoD Foreign Clearance Guide (FCG) shall be consulted for out-of-continental United States (CONUS) operations. [420]

4.31.3 Aircraft Flight Logs. The flightcrew shall enter in the aircraft flight log each mechanical irregularity discovered during the flight. All unusual events (e.g., overweight or hard landings, lightning or bird strike, static discharge, or flight through hail or severe turbulence) will be recorded in the aircraft log. [421]

4.32 Specific Operational Restrictions

4.32.1 Use of Flight Manual Data. Aircraft flight manual data shall be used to ensure that adequate takeoff, climb, approach, and landing performance is available for the actual conditions encountered. [422] Additional restrictions, as outlined in the tables below, are established to ensure a prudent level of safety during routine line operations.

4.32.2 Minimum Runway Lengths. Table 4-4 contains the minimum runway lengths that shall be used for the aircraft. A Headquarters waiver is required for takeoffs from or landings on runways of lesser-length runways. [423]

Table 4-4 Minimum Runway Length for Mission Management Operations

Aircraft	Runway
King Air B200	3,500 ft
Gulfstream II/III	6,000 ft

4.32.3 Wind Restrictions. For normal operations, airfields shall be considered below minimums for takeoff and landing when winds, including gusts, are greater than those established below: [424]

Table 4-5 Wind Restrictions

Aircraft	Maximum Component	Tailwind Component	Crosswind
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King Air B200	45 kts	10 kts	25 kts
Gulfstream II/III	40 kts	10 kts	20 kts

4.32.4 Minimum Fuel for Landing. Minimum fuel for landing is established in recognition of three factors: (1) Fuel required to execute an unanticipated go-around and traffic pattern; (2) Fuel required for landing and rollout; and (3) Allowance for fuel quantity measuring system error. All flights shall be planned to have no less than the following minimum indicated fuel available at touchdown on the final landing: [425]

Table 4-6 Minimum Landing Fuel

Aircraft	Minimum Landing Fuel
King Air B200	400 pounds
Gulfstream II/III	3,000 pounds

Chapter 5. Unmanned Aircraft Systems Operations

5.1 General

5.1.1 Emerging Concepts. Technological advances will continue to provide unprecedented leaps in UAS capability. NASA is primarily concerned with UAS technology as it applies to aeronautics, space science, and Earth science. Technology that permits the rapid dissemination of remote sensing data products will play an important role in this effort.

5.1.2 UAS Definition. In general, a UAS is a powered or unpowered aerial vehicle that does not carry a human operator, uses aerodynamic forces to provide vehicle lift, and can fly autonomously or be piloted remotely. UASs range from micro vehicles measuring inches in size and ounces in weight to large aircraft weighing more than 30,000 pounds. All UASs shall be operated to meet the requirements of this NPR. Appendix I defines the appropriate level of operational control for each category of UAS. [426] For example, a model or small UAS that weighs less than or equal to 55 pounds and whose top speed is less than or equal to 70 knots has fewer oversight requirements than a UAS that weighs more than 300 pounds and whose top speed is greater than 200 knots. Due to the diverse nature of UAS performance and interface, requirements may need to be adjusted to ensure the appropriate level of operational control.

5.1.3 UAS Flightcrew Definition and Responsibilities. The definitions and requirements to be qualified as a NASA UAS pilot or observer are found in Appendix J. Any UAS, operated on behalf of NASA, that operates within the NAS shall be piloted by an individual who is either a NASA pilot or holds an FAA Pilot's License. [427] The UAS flightcrew is responsible for the safe control and operation of the UAS and must be involved in all mission planning; complete prelaunch, mission, and recovery checklists; and assist in evaluating and disseminating in-flight data.

5.1.4 Policy. Center Directors shall establish procedures in accordance with Appendixes I and J to ensure that all UAS flights are properly approved and documented. [428] Center Directors also shall ensure that UAS flightcrews and operations receive direct oversight by the Center's Flight Operations Office or through another Center with a Flight Operations Department. [429] Because UASs are aircraft, other forms of control, specific to aviation, apply to their employment. The most common are air control, airspace control, and air direction, which are exercised by aviation personnel and agencies.

5.1.5 UAS Command and Control Systems. UAS flightcrews must have the capabilities to command, control, coordinate, and manage the UAS. These systems include air control and airspace control as discussed below.

5.1.5.1 Air Control. Air control is the authority to direct the physical maneuvers of a UAS in flight or to direct a UAS to gather data or operate in a specific area.

5.1.5.2 Airspace Control. Airspace control provides for the coordination, integration, and regulation of the use of a defined airspace and identification of all airspace users. Any airborne object that may interfere with the flight path or trajectory of any other object within the NAS airspace is of concern and requires airspace coordination and integration. Airspace control is the authority to direct the maneuvers of a UAS (along with other aircraft and airspace users) for the best use of the airspace. Airspace control is accomplished through established procedures for coordination of airspace by ATC or range authorities. Principles and procedures of airspace control used in manned flight

operations apply to UAS operations. UASs capable of long-distance flight are normally routed through existing air control points by airspace control agencies. Airspace control authority is inherent in the operator whose unit is responsible for particular blocks of airspace; positive separation between aircraft and UASs is required and is the responsibility of the PIC and airspace control agency. This may be accomplished by the following:

- a. Activating temporary airspace coordination areas (ACAs); Class D airspace or restricted operations zones (ROZs) for UAS takeoffs and landings; and mission areas or flight routes. ROZs are also known as restricted operations areas (ROAs).
- b. Routing separation via existing air control points. Specific UAS routes may be created by connecting selected air control points.
- c. Altitude separation, which can be effected by having block altitudes or by deconflicting the altitude at which the UAS is flying with other airspace users.
- d. Time separation, which can be effected by having block times for UAS operations.
- e. Any combination of the above, as required.

5.2 Planning

5.2.1 Operating Within the Continental United States (CONUS). Before any deployment, considerable planning takes place well in advance of a UAS operation. UASs increase the workload on personnel assigned, who very often know little about the unique requirements of UAS integration in operations in CONUS or overseas. Coordination with appropriate agencies or countries should occur as soon as the decision is made to employ a UAS.

5.2.1.1 Certificate of Authorization. The FAA is responsible for airspace management within the CONUS. If a UAS will be flown outside the boundaries of special-use airspace, sufficient time must be allowed to authorize UAS operations. The FAA Administrator will draft a certificate of authorization, which sets forth the requirements for UAS personnel qualifications, communications procedures, and a definition of the requested airspace. A UAS cannot fly beyond the boundaries of special-use airspace without specific authorization of the FAA.

5.2.1.2 Memorandum of Understanding. A memorandum of understanding with the local air traffic control facility is required to ensure that they and the UAS flightcrews have a complete understanding and agree upon the air traffic control procedures that will be used to ensure safe UAS operations in the operating area. If additional air traffic control services are required, the UAS operator may be asked to augment the local air traffic control facility with additional air traffic control personnel.

5.2.1.3 Letter of Agreement. A letter of agreement with local air facilities shall be completed to ensure that proper coordination of support requirements is understood and agreed upon. [430] Fuel and hazardous material storage, hangar facilities, runway use, or any other logistical and support requirements must be agreed on in this document.

5.2.2 Deployment Overseas. Foreign governments are sensitive to the valuable information that could be collected and capabilities of UASs, as well as to the inherent risks associated with unmanned flight operations. As NASA aircraft, NASA UASs have state aircraft status. UAS planners must ensure that UAS operations are included at the outset of integration planning within host nation (HN) airspace. Planners must have a firm understanding of the UAS to be employed so that they can satisfy any protests or concerns from the HN. The UAS planner shall work via the Office of International and Interagency Relations to gain diplomatic clearances prior to any UAS

operations within their represented country. [431]

5.3 Preflight Operations

5.3.1 Operations Site. Particular consideration must be given to the location of the UAS operations site. Depending on the UAS, an adequate runway may be required for safe UAS operations. At a minimum, a proper landing surface must be available to safely recover the UAS upon completing its mission. Consideration also must be given to the distance from the UAS operations site to the area of operations (AO). Many UASs are not particularly fast and require considerable time to fly to their mission area. The location of an adequate launch and recovery area and its distance to the AO and control station are very important considerations when employing a UAS. Availability of adequate roads or other transportation methods for resupply of fuel and other UAS support requirements are critical to sustained UAS operations. If the UAS is expected to move from one site to another, transportation support becomes increasingly important.

5.3.2 Weather. UAS managers must consider the expected weather conditions in the AO at the time of operations. Many UASs cannot operate in inclement weather (e.g., high winds and precipitation or when the cloud layer is below the UAS's operating altitude). From the outset, due consideration must be given to probable weather conditions.

5.3.3 Communication. To provide UASs with adequate support, the command and control architecture must be linked to the UAS. Most UASs have a ground control station (GCS), a tracking and control unit, a portable control station (PCS), and remote receiving stations. The UAS is manually controlled by a pilot from a control station or is programmed to fly independently under control of its autopilot. More than one control station may be used to increase the UAS's effective range or to control more than one UAS.

5.3.4 Operational Phase. UAS operations are conducted similarly to manned aviation operations. Once the UAS has authority to conduct the mission, many tasks are executed simultaneously. The operations phase begins the planning process. The program managers and the UAS flightcrew study the assigned mission and plan for its operation. The maintenance crew begins preparation of the UAS and the UAS ground control system, while communications personnel ensure that the proper communication connectivity is provided to fulfill the mission.

5.3.5 Route Planning. UAS missions will be planned by the UAS planners in close coordination with the Center's Flight Operations Office. This is done to ensure there is no conflict with other flight operations and to allow timely inclusion of UAS missions in the Center's planning process. Flight planning for routes that afford little or no time to avert the response to an erroneous data entry that could lead to a significant mishap (Class C or higher) shall have an independent review both before loading in the mission computer and after upload on the UAS is complete. [432]

5.3.6 In-flight Emergencies. During planning, sufficient attention must be given to the possibility that an in-flight emergency may occur. Particular attention should be given to the location of emergency landing sites if the UAS exits controlled flight and impacts the ground. Flight paths, minimum-risk routes, and other air management tools must be included.

5.3.6.1 Loss of Link Procedures. When a UAS senses a significant delay or loss of the command uplink, the predetermined loss-of-link procedures will be invoked to place the UAS on the returns home profile, or a suitable alternate route and recovery location. The UAS return home or alternate profile is a preapproved route (at a preapproved altitude) to its preapproved return home or alternate site. During this emergency, the UAS pilot will attempt to reestablish communication with the UAS.

5.3.6.2 Agency Notification. Upon notification of an in-flight emergency, emergency procedures shall be performed by the UAS pilot in accordance with the Center procedures, flight authorizations, and the UAS operations manual. [433] The Center's Flight Operations Office will then relay and coordinate with the appropriate agencies (e.g., FAA, ATC). The Center's Flight Operations Office will ensure that air control agencies have been notified of the UAS emergency and its expected course. Controlling agencies will ensure that other air assets are separated from the UAS's expected route of flight and notify the Center's Flight Operations Office of any further actions taken.

5.4 Flight Operations

5.4.1 Flight Brief. A flight brief that includes the flightcrew, a program representative, and a maintenance representative shall be conducted prior to all flights. Briefs provide specific information in accordance with UAS standard operating procedures. Briefs will include the following:

- a. Weather update.
- b. Program brief.
- c. System update.
- d. Emergency divert airfields.
- e. Emergency procedures and terminology.
- f. Mission profile. [434]

5.4.2 Takeoff Method. The maintenance crew readies the UAS for launch as the flightcrew performs systems checks to ensure that systems perform in accordance with operating procedures. Systems checks shall include an independent means to verify waypoints entered into a navigational system prior to takeoff. [435]

5.4.2.1 If a suitable runway is available, the UAS operator may perform a conventional rolling takeoff. The length of runway required depends on the UAS. If a suitable runway is not available, then an alternate launch method shall be used. [436] An adequate surface area must be available for a safe landing for the UAS and safe mobility of nearby personnel.

5.4.3 Preparing for Recovery. Upon return to the UAS operations site, flight and maintenance crews prepare for UAS recovery. The UAS recovery checklist shall be adhered to in accordance with the operations manual. [437]

5.5 Flight Crew Requirements

5.5.1 Qualifications. UAS flightcrew members shall become qualified in accordance with written Center standards in accordance with Appendix J. [438] The Center's Chief of Flight Operations, with the concurrence of the Center Director, shall designate UAS pilots for the specific type of UAS they operate. [439] The Center's Chief of Flight Operations shall ensure that each UAS flightcrew possesses an adequate level of training and experience to perform the duties of the designated positions as laid out in Appendix J. [440] Overall qualifications for the designations are made based on flightcrew's overall flight experience, experience in similar types of UAS aircraft, experience in the actual UAS aircraft type, other training, and demonstrated performance. Designated UAS pilots are those who perform UAS piloting duties, as a part of their official position descriptions, to fulfill NASA contract requirements, or in accordance with an interagency agreement.

5.5.2 Training. Depending on the category of the UAS pilot, per Appendix J, qualification training may be conducted under the direction of a military, civilian, or NASA UAS instructor pilot.

5.5.2.1 Qualification training will vary with the UAS pilot type, as listed in Appendix J, but will normally include:

- a. Ground training (including UAS ground control station checkout), handbook study, attendance at formal UAS aircraft training programs, emergency procedure training, and the performance of a UAS aircraft written examination (open book).
- b. Simulator training, if available, including normal and emergency procedure training.
- c. UAS aircraft checkout flights, including a prescribed number of UAS flights and landings (if applicable) under the supervision of a UAS instructor pilot.
- d. A mission profile flight monitored by a UAS instructor pilot to obtain full UAS mission qualification.
- e. Per Appendix J, remote pilots shall meet the minimum qualifications for a NASA pilot based on this NPR and Center-established processes and procedures. [441]
- f. Fully qualified NASA pilots may be assigned as UAS pilots, but for UAS pilots to fly manned NASA aircraft, they shall meet NASA pilot qualification minimums. [442]

5.5.2.2 Initial UAS training shall be documented by each Center in accordance with Appendix J, with the approval of the Center's Chief of Flight Operations. [443] The training program will be tailored to consider previous experience in UAS aircraft, currency in similar types of UAS aircraft, previous training background, and availability of other resources to ensure an adequate level of training.

5.5.2.3 In the case of prototype, experimental, or research UAS aircraft for which no formal schools are available, the services of the designers and the manufacturer's best qualified personnel shall be utilized to brief and familiarize the UAS pilots with the aircraft, UAS aircraft systems, and ground control stations. In addition, existing UAS simulators and UAS aircraft of a similar nature will be used to train pilots prior to flying a UAS research vehicle. [444]

5.5.2.4 Training for all members of the UAS flightcrew shall include crew resource management training. [445]

5.5.3 Currency. Currency is dependent on the category of UAS pilot. In accordance with Appendix J, Center Directors have the authority to establish and approve UAS flight currency requirements. Remote pilot requirements are detailed in Chapter 12 and Appendix J. These include specific requirements established for particular UAS flight research programs and UAS aircraft. Records of qualification and flight evaluation are required. NASA UAS flight time shall be kept separate from NASA manned aircraft flight time, by type, in NAMIS. [446] A review of UAS pilot and crew qualifications shall be made prior to flight assignment to ensure that prerequisites for the intended mission are met. [447] The Center's Chief of Flight Operations shall designate the crewmembers for UASs that are under the Center's purview. [448]

5.6 Airworthiness and Flight Safety Reviews

5.6.1 General. The airworthiness requirements detailed in Chapter 2 must be used for UAS airworthiness approvals. Additionally, all UAS flight operations under NASA's purview are subject to the requirements of NPR 8715.5, Range Safety Program.

5.6.2 Airworthiness and Flight Safety Review Board. The Airworthiness and Flight Safety Review Board (AFSRB) shall participate in or, at their option, conduct reviews to establish the airworthiness and evaluate the safety of flight operations. [] The chair and members are designated by the Center Director as discussed in Chapter 2.5. Other personnel who shall participate in the review include the Safety, Reliability, and Quality Assurance Office, the mission manager and/or Principal Investigator, the UAS operator, and Range Safety personnel. [450]

5.6.2.1 The following additional topics shall be addressed by a NASA AFSRB to assess the risks associated with a UAS flight program:

- a. General outline of major UASs.
- b. Communication links and frequency management plan.
- c. Flight control system and configuration control procedures.
- d. Backup systems and procedures.
- e. Flight terminations systems, including ground abort. [451]

5.6.3 Public Safety. The program/project manager shall limit the assessed collective risk associated with aerospace vehicle operation and ensure that the probability of doing harm to a member of the general public is not greater than the criteria established by NPR 8715.5. [452] The ability to achieve this level of protection can be demonstrated through a combination of analysis, tests, simulations, use of redundancy in design, and flight operational procedures.

Chapter 6. Aviation Safety

6.1 Introduction

6.1.1 This chapter describes the roles and responsibilities of NASA Aviation Management and Aviation Safety Professionals and defines minimum qualifications and training of Center ASOs. The chapter also provides the basic requirements for NASA's Aviation Safety Program and provides structure for managers and ASOs to establish/implement their local programs. Managers and ASOs will also find requirements regarding aircraft hazard and mishap reporting.

6.1.2 The objectives of the NASA's Aviation Safety Program are accomplished through the detection and elimination of hazards, safety awareness training, and enforcement of high standards of conduct and performance. The primary purposes of the NASA Aviation Safety Program are:

- a. Preserving human and material resources by preventing damage and injury through the elimination of aviation safety hazards throughout NASA.
- b. Enhancing safety awareness in all NASA employees and contractor personnel.

6.1.3 Safety Management System

6.1.3.1 While NASA has a robust aviation safety program, the Safety Management System (SMS) is a recognized standard throughout the aviation industry. It is recognized by the International Civil Aviation Organization (ICAO) and civil aviation authorities (CAA) as the next step in the evolution of safety in aviation.

6.1.3.2 This NPR establishes policy and procedures for the NASA Aircraft Operations SMS in accordance with ICAO, Federal, and industry standards. Compliance is mandatory and shall be monitored during biennial IAOP functional reviews. [453] The SMS shall establish the mechanisms necessary to deliver and monitor safety performance. SMS is integrated into the policies and procedures (throughout this document) that meet the requirements of an SMS. [454] Specifically, SMS requires the following:

- a. A structured means of safety risk management decision making.
- b. A means of demonstrating safety management capability before system failures occur.
- c. Increased confidence in risk controls through structured safety assurance processes.
- d. An effective interface for knowledge sharing.
- e. A safety promotion framework to support a sound safety culture.

6.2 Aviation Safety Roles and Responsibilities

6.2.1 The Chief, Safety and Mission Assurance provides leadership, policy direction, functional oversight, assessment, standards, and coordination for safety and mission assurance affecting NASA aviation operations.

6.2.2 Center Directors are responsible for the safe operation of all aircraft, including UASs, assigned to or operating from their Centers. Center Directors will support and maintain an aviation safety program and organization in accordance with this chapter. Center Directors shall ensure that the

Center ASO is granted formal access to senior management when safety issues cannot be resolved at a lower level in the flight organization. [455]

6.2.3 The Center's Chief of Flight Operations is the senior line manager with authority and responsibility for all flight operations at the Center and is responsible to the Center Director for the safe and effective operation of all aircraft, including UASs. This is necessary to ensure that aviation management decisions are made only by designated and qualified individuals and to ensure that management actions do not create or contribute to unsafe conditions.

6.2.4 The Director, HQ AD is responsible for the implementation of Agency aviation safety policy developed by the Office of Safety and Mission Assurance. The Director, HQ AD, will ensure that adequate reviews of all NASA flight operations are conducted to ensure that NASA aircraft management policies are followed.

6.2.5 The Headquarters Aviation Safety Manager (ASM) within the Office of Safety and Mission Assurance (OSMA) shall be a qualified ASO. [456] The ASM shall provide safety and mission assurance oversight for the Agency's aviation activities. [457] Additionally, the ASM shall:

- a. Coordinate with AD regarding OSMA requirements affecting aviation safety or reporting. [458]
- b. Identify aviation safety issues through mishap investigation and analysis. [459]
- c. Participate in the annual NASA ASO Conference. [460]
- d. Monitor implementation of the Agency's Aviation Safety Program. [461]
- e. Attend selected program flight readiness and safety reviews. [462]
- f. Serve as an advisor to the IAOP and participate in IAOP activities, including meetings, reviews, and subpanel activities. [463]
- g. Conduct aviation safety staff assistance visits and reviews. [464]
- h. Coordinate recommendations from mishap investigations that require corrective action from sources or agencies outside of NASA. [465]
- i. Participate in selected aircraft flight operations. [466]

6.2.6 The HQ AD ASO serves as the senior advisor to the Assistant Administrator for the Office of Strategic Infrastructure and the Director of the AD on aviation safety matters. The ASO is responsible for implementing the Agency's Aviation Safety Program, coordinating the NASA Annual ASO Conference, and managing the Agency's IAOP review program. The ASO also provides aviation safety support to Center aircraft managers and ASOs and serves as liaison to other Federal agencies and military services on aviation safety matters.

6.2.7 The IAOP ASO subpanel keeps the IAOP chair informed of safety developments and issues. The ASO subpanel chair serves as the main interface between Center ASOs and Headquarters, providing advice and counsel regarding safety issues and concerns. The ASO subpanel chair is responsible for briefing safety issues and concerns of the Centers to the IAOP panel and shall schedule and conduct subpanel meetings and teleconferences. [467] The chair is selected from the membership of the ASO subpanel.

6.2.8 Center Aviation Safety Officers. The Center's Chief of Flight Operations, with the concurrence of the Center Director, shall appoint an ASO. [468] The ASO will be a civil servant assigned to the Flight Operations Department, serve as the Center's focal point for aviation safety, and act on behalf of the Center Director when discharging this responsibility. The ASO has the duty to advise the

Chief of Flight Operations regarding safety issues/concerns within the organization. Managers will use the advice of the ASO in formulating organizational decisions but must not expect or rely upon the ASO to make managerial decisions. The ASO serves as a member of the Center's ARB and is responsible for managing the Center's Aviation Safety Program and ensuring that the goals of the program are clearly understood. If the ASO believes that a safety concern has not been dealt with sufficiently by the Flight Operations organization, the ASO may take the concern directly to the Center Director. In addition, the ASO may take the concern to the Chief, Safety and Mission Assurance or the Assistant Administrator for the Office of Strategic Infrastructure.

6.2.9 Aviation Safety Officer qualifications include the following:

- a. The ASO shall hold qualification as a NASA PIC in primary research aircraft type used at the Center. [469]
- b. The ASO, within 1 year of appointment, shall complete a 2-week course in aviation safety program management. [470] Within 2 years of appointment, the ASO shall have graduated from a recognized Military Aviation/Flight Safety Officer Course, or an Academic Aviation Safety Certificate Program (of at least 6-weeks duration). [471]

6.2.10 Aviation Safety Officer Recurrent Training requirements include the following:

6.2.10.1 Recurrent Training. Each Center shall establish a continuing education program to ensure that each ASO maintains adequate knowledge to discharge the duties of the office. [472] To maintain familiarity with the latest aviation safety principles as a NASA ASO, the ASO shall be actively engaged in the Center's aviation operations program and complete 40 hours of continuing education in ASO course elements within 24 calendar months. [473] Training for ASOs include the following course elements:

- a. Aviation Safety Program management.
- b. System safety.
- c. Aviation accident investigation.
- d. Mishap planning.
- e. Human factors.
- f. Maintenance safety.
- g. Risk management.
- h. Aviation law.
- i. Crew resource management.
- j. Occupation Safety and Health Administration (OSHA).
- k. Aviation medicine/physiology.

6.3 Center's Aviation Safety Program

6.3.1 The Center's Aviation Safety Program shall be documented in a single comprehensive manual. [474] The program must address requirements of the aviation ground environment, as well as all aspects of the flight environment. NASA's Aviation Safety Programs are dynamic and must provide oversight to the many changes that occur in the aviation operational environment. The following

program elements are required by NASA policy or Federal regulation:

6.3.1.1 Center's Aviation Safety Working Group. The Center's aviation safety working group provides a forum to discuss and resolve Center aviation safety issues. The working group is chaired by the ASO, shall meet at least semiannually, and reports to the Chief of Flight Operations. [475] Areas represented on the working group include, but are not limited to, operations, maintenance, engineering, aviation safety, airfield facilities, and QA.

6.3.1.2 Inspections and Evaluations. HQ AD, together with independent oversight from the OSMA, shall conduct an aviation safety review of each Center, biennially utilizing the IAOP Review Program. [476] Centers conducting flight operations shall perform an independent flight operations review during the alternate year when an IAOP review is not scheduled. [477] This review may be conducted by the Center's Safety Office, or an external aviation inspection organization, and shall provide an objective evaluation of selected aircraft operations, maintenance, crew procedures, and facilities to ensure safe and efficient operations. [478]

6.3.1.3 Close Call Reporting (Hazards and Anomalies). The Center's Aviation Safety Program shall establish a procedure for collecting hazards/anomalies/close calls data from personnel. [479] This procedure shall document and direct hazards to the appropriate management level for investigation and resolution. [480] Close Calls shall be documented, trended, and disseminated to internal personnel and other NASA flight organizations for educational and awareness purposes. [481] Centers shall follow the Close Call reporting requirements contained in NPR 8621.1, NASA Procedural Requirements for Mishap and Close Call Reporting, Investigating, and Recordkeeping. [482]

a. A Close Call is defined as an occurrence or a condition of employee concern in which there is no injury, or only minor injury requiring first aid, and no significant equipment/property damage/mission failure (less than \$1,000), but which possesses a potential to cause a mishap.

b. A hazard is defined as an existing or potential condition that can result in or contribute to a mishap.

c. Aircraft Mishap and Close Call Investigation. The principles of mishap reporting, investigation and identification of root causes, and corrective action are central to an effective aviation safety program, which will be conducted in accordance with NPR 8621.1. Close Call reporting, investigation, and dissemination of lessons learned are essential elements of mishap prevention.

6.3.1.4 Cultural Surveys. The Chief of Flight Operations, with the assistance of the ASO, shall conduct a Government/industry-recognized cultural survey, assessment, or workshop within aircraft operations every 2 years or within 6 months of hiring a new Chief of Aircraft Operations. [483] This survey must:

a. Determine employees' expectations of the Center's aviation safety program.

b. Evaluate the effectiveness of the current aviation safety program.

c. The goal of this survey is to provide anonymous feedback to management regarding perceptions of organizational climate, management practices, safety, and risk mitigation. These surveys will foster better communication by highlighting and addressing concerns within flight operations.

6.3.1.5 Quarterly Aviation Safety Training. ASOs shall conduct safety training for operations and maintenance personnel. [484] The ASO shall establish a process to ensure that topics covered are disseminated to those who could not attend. [485]

6.3.1.6 Awards Program. Centers shall establish an Aviation Safety Awards program. [486]

6.3.1.7 Risk Assessment and Hazard Analysis. The ASO shall ensure that risk assessment and hazard-analysis procedures are established. These procedures must address risks, hazards, and mitigation methods associated with aircraft modifications and research flights, in accordance with Chapter 2 of NPR 8715.3. [487]

6.3.1.8 Project and Program Safety Plans. The ASO shall ensure that project and program safety plans are subject to a review process. [488] The review ensures that the plans address associated risks and hazards with the specific project or program. Once approved, the ASO shall ensure that the plans are disseminated to all involved personnel. [489] The requirements for these safety plans may be satisfied by flight test plans or safety permits but still are subject to the review process.

6.3.1.9 Facilities and Equipment. The ASO shall ensure that aviation facilities are maintained and inspected in accordance with applicable OSHA and NASA safety standards. [490] These facilities include, but are not limited to, the airfield, aircrew spaces, maintenance shops, ground support equipment, Crash Fire Rescue (CFR) facilities, and ATC facilities.

6.3.1.10 Cargo Safety. The ASO shall provide safety oversight during the handling and stowage of cargo, including hazardous materials, aboard NASA aircraft. [491] While the Transportation Officer ensures that mixed cargo and passenger loads meet all Federal requirements, the ASO ensures that contract carriers and airlift services used by NASA comply with Department of Transportation (DoT) regulations, including 49 C.F.R. § 175, Carriage by Aircraft, in the transportation of hazardous materials and cargo.

6.3.1.11 Dissemination of Aviation Safety-Related Information. ASOs shall ensure that aviation safety-related information is distributed throughout aircraft operations and maintenance. [492] Safety information that would be of interest Agency-wide shall be sent to the OSMA for distribution. [493]

6.3.1.12 Crew Resource Management and Training. All NASA aircrew shall, at least once per calendar year, attend a crew resource management course of at least 4 hours in duration. [494]

6.4 Pre-Mishap Plan/Aircraft Incident Response Plan

6.4.1 Each Center shall publish and maintain an Aircraft/Airfield Pre-Mishap Plan in accordance with the procedures established in NPR 8621.1. [495] Proper response to an aircraft mishap requires documented preplanning to mitigate risk to personnel and property. The pre-mishap plan shall be tailored to local needs and capabilities and be developed and coordinated with all supporting and supported activities or agencies. [496] The plan must clearly assign responsibilities, provide for alternative plans, ensure optimum use of available and backup resources, and be rehearsed annually. This exercise may be accomplished through desktop or simulation, as appropriate. The plan shall be maintained for each NASA operational airfield, heliport, and aviation activity. [497] In addition to the requirements in NPR 8621.1, each Center's plan shall:

- a. Ensure that local fire/crash-rescue personnel are briefed annually, and prior to operation of newly acquired aircraft, on rescue and emergency procedures peculiar to the aircraft regularly operated at that facility. [498]
- b. Ensure that mock mishap drills are held and that the ASO evaluates the results to ensure optimal coordination with pre-mishap plans. [499]
- c. Address procedures for aircraft mishaps away from home field. [500]
- d. Establish procedures for notifying and working with the National Transportation Safety Board (NTSB) and the FAA for aircraft accidents reportable under Federal regulations. [501]

Chapter 7. Aviation Medical Program

7.1 Introduction

7.1.1 This section details requirements and procedures for medical certification of NASA aircraft's primary crewmembers. It is applicable to NASA Headquarters and Centers, including Component Facilities, and applies to both civil service and contractor pilots flying NASA aircraft. This section does not apply to space flight or to astronaut pilots.

7.2 Primary Aircrew Medical Requirements

7.2.1 Pilots. Pilots shall hold an FAA First Class medical certificate, military pilot flight physical, or obtain a NASA flight medical certification, renewed annually or more frequently, if specified by the Center Director or a competent medical authority. [502] At the discretion of the Center's Chief of Flight Operations, records of aeromedical certification conducted by non-NASA Aviation Medical Examiners (AME) may be reviewed by a NASA Aeromedical Physician.

7.2.1.1 Flightcrew of high performance jet aircraft or ejection-seat configured aircraft shall obtain a military pilot flight physical or NASA flight medical certification. [503]

7.2.1.2 Pilots 55 years of age and older shall be medically certified every 6 months. [504]

7.2.2 Flight Engineers. Flight Engineers shall hold either an FAA Second Class medical certificate, military flight physical, or obtain NASA flight medical certification, which must be renewed annually or earlier if specified by a competent medical authority. [506]

7.2.3 Other Primary Aircrew. Other primary aircrew shall hold either an FAA Third Class medical, military flight physical, or NASA flight medical certification, which must be renewed annually or earlier, if specified by a competent medical authority. [507]

7.2.4 Qualified Non-Crewmembers. Qualified non-crewmembers shall obtain medical clearances as required by Center procedures. At a minimum, a medical screening must be conducted by a NASA physician, as appropriate for the mission. [508]

7.2.5 Primary Aircrews Released from Flight Status Due to Medical Disqualification. Center Directors shall establish procedures, in coordination with their personnel offices, to ensure that primary aircrews are assigned to duties not involving flying if they become medically disqualified. []

7.3 Flight Physical Records

7.3.1 Copies of current medical certification shall be kept on file at the primary aircrew and qualified non-crewmembers' operating site. [509]

7.3.2 Upon completion of a flight physical, the individual will notify the Chief of Flight Operations of the pass/fail status. The Chief of Flight Operations may request certificate confirmation from the awarding authority.

7.3.3 Centers may choose to accept flight physicals conducted by non-NASA AMEs (e.g., an FAA-AME). At the discretion of the Chief of Flight Operations, a review of the records of

aeromedical certification by a NASA Aeromedical Physician can be requested.

7.4 Review Boards

7.4.1 NASA Aerospace Medicine Board. When requested by the Center or individual, the medical examination results of pilots who do not meet the required standards may be reviewed by the NASA Aerospace Medicine Board and NASA Medical Policy Board, in accordance with the board's charter.

7.5 Waivers

7.5.1 Flightcrews shall report Special Issuances (FAA Waivers) and FAA Statements of Demonstrated Ability (SODA) to the Chief of Flight Operations for review by a NASA Aeromedical Physician. [510]

7.5.2 Considerations for NASA-specific aeromedical waivers will be processed through the NASA Aerospace Medicine Board and the NASA Medical Policy Board, as appropriate.

Chapter 8. Aircraft Acquisitions and Dispositions

8.1 General

This chapter establishes policy for acquisition and disposition of all NASA aircraft/UASs. The Center's Aircraft Flight Operations organizations shall coordinate all aircraft acquisition and disposition actions with the cognizant Center Supply and Equipment Management Officer(s) in accordance with NPR 4200.1, NASA Equipment Management Procedural Requirements. [511] In addition, transfer of aircraft between Federal agencies and disposal of aircraft, including exchange/sales by Federal agencies, shall be authorized by GSA. [512]

8.2 Aircraft Acquisition

8.2.1 Prior to acquiring aircraft for operational use, the Mission Directorate, the Associate Administrator, or the Center Director shall submit an acquisition request to the HQ AD, per Appendix H, along with a business case analysis in support of the aircraft acquisition. [513] The Business Case Analysis may be in a format of choice, but must contain sufficient detail to answer questions posed in OMB Circular A-11, Exhibit 300, Part I. The purpose of the business case analysis is to determine the most economical acquisition alternative, over the life cycle of the program, in meeting stated aircraft requirements. The business case analysis also must clearly link the aircraft acquisition to Agency strategic objectives and specific program/project goals and identify life-cycle budget requirements. Typical acquisition alternatives include use of existing Agency aircraft, use of other agencies' aircraft, aircraft lease, aircraft rental, turn-key aircraft services, and procurement. Procurement of aircraft shall be conducted in accordance with established FAR and guidelines, including OMB Circulars A-76 and A-126, and initiated only after approval from the Assistant Administrator for the Office of Strategic Infrastructure and after the following alternatives have been considered in the following order:

- a. Use of available NASA aircraft resources.
- b. Use of public aircraft owned by other Government agencies through loan or transfer.
- c. Charter or lease of civil aircraft. [514]

8.2.2 In completing the requirements of Appendix H, the program/project manager shall coordinate with the Center Environmental Management Office to determine whether the proposed aircraft acquisition requires preparation of an environmental assessment. [515]

8.2.3 The Assistant Administrator for the Office of Strategic Infrastructure reviews and approves aircraft acquisition requests, including long-term aircraft leases, after coordination and consultation with the appropriate Mission Directorate Associate Administrator, the Office of the General Counsel, the Office of the Chief Financial Officer (CFO), the Office of Legislative and Intergovernmental Affairs, and the Office of International and Interagency Relations (if DoD related).

8.2.4 Mission Directorates establish the requirements and funding level for each aircraft assigned to support their programs and shall approve the program/project managers' acquisition requests prior to submission to the HQ AD. [516]

8.2.5 The HQ AD coordinates and assists Mission Directorates, program/project managers, and

Centers with acquisition, assignment, and disposition of all aircraft. AD shall enter all acquired aircraft into FAIRS. [517]

8.2.6 Centers shall record all acquired aircraft in the NASA Equipment Management System (NEMS) in accordance with NPR 4200.1. [518] Centers shall register all aircraft, excluding parts and DoD-loaned aircraft, with the FAA. [519]

8.3 Aircraft Materiel Acquisition Procedures

8.3.1 “Parts Aircraft” Acquisition. The program/project manager or Center Director shall notify the HQ AD prior to acquisition of an aircraft whose intended use is solely for “parts aircraft.” [520] In addition to all applicable Federal regulations, acquisition of aircraft whose intended use is solely for “parts aircraft” are subject to the following procedures:

- a. Centers shall remove the data plates from all aircraft acquired solely for parts purposes and forward the data plates to HQ AD for disposition. [521]
- b. Centers shall enter parts aircraft into each respective Center’s property inventory records, in accordance with NPR 4200.1. [522]

8.3.2 Aircraft Materiel Acquisition. Aircraft materiel, such as spare parts, shall be acquired, managed, and controlled in compliance with NPR 4100.1 and 41 C.F.R. § 102-33, Management of Government Aircraft. [523] Aircraft materiel will be maintained under proper storage, protection, maintenance procedures, and recordkeeping throughout their life cycles.

8.3.3 Flight Safety Critical Aircraft Parts (FSCAP) and Life Limited Parts.

8.3.3.1 For as long as FSCAP or Life Limited Parts are used or kept by NASA, the documentation that accompanies those parts shall be maintained and kept updated. [524]

8.3.3.2 When FSCAP and Life Limited Parts are disposed, the up-to-date documentation shall accompany the parts. [525]

8.3.3.3 The Criticality Code of an FSCAP shall be maintained and perpetuated on all property records and reports of excess. [526]

8.3.4 Dual Use Military FSCAP. Dual-use military FSCAP may be used on nonmilitary aircraft operated under restricted or standard airworthiness certificates if the parts are inspected and approved for such installation by the FAA. Guidance on such use is provided in FAA Advisory Circular 20-142, CHG 1, Eligibility and Evaluation of U.S. Military Surplus Flight Safety Critical Aircraft Parts, Engines, and Propellers.

8.4 Aircraft Disposition

8.4.1 NASA aircraft are usually unique, highly modified aircraft used to meet a requirement or capability not readily available in the marketplace. A NASA owned aircraft shall be disposed of when it is excess to the current and anticipated needs of the Agency. [527] Disposal of NASA owned aircraft shall be in accordance with Federal Property Management Regulations; the applicable portions of NPD 4300.1, NASA Personal Property Disposal Policy; and NPR 4300.1, NASA Personal Property Disposal Procedural Requirements. [528] Disposal of NASA aircraft identified as artifacts or heritage assets shall be in accordance with NPR 4310.1, Identification and Disposition of NASA Artifacts. [529] Aircraft disposition shall be coordinated in advance with the HQ AD and approved by the Assistant Administrator for the Office of Strategic Infrastructure. [530]

8.4.1.1 External Loans. External loan agreements shall be reviewed by the Center's Chief Counsel, other Center officials as appropriate, and approved by the Center Supply and Equipment Management Officer (SEMO), in accordance with NPR 4200.1, paragraphs 3.3.2, 3.3.3, and 3.4. [531] When the concurrence of the authorizing official has been obtained and the loan is to be made external to NASA, the SEMO will determine the appropriate method for accomplishing the loan. Aircraft loaned externally by NASA for display, even when done as part of the NASA Exhibits Program, shall be accompanied by a loan agreement signed by the Center SEMO. [532]

8.4.1.2 Exchange/Sale. An exchange/sale generally occurs when a NASA organization desires to replace or upgrade a nonexcess item of property. Aircraft (FSC Group 15) is currently listed as restricted and prohibited from exchange/sale (41 C.F.R. § 102-39.60(a), What Restrictions and Prohibitions Apply to the Exchange/Sale of Personal Property?). Unless a deviation is requested of and approved by GSA, as addressed in 41 C.F.R. § 102-2, Federal Management Regulation System, the provisions of 41 C.F.R. § 102-39.25, When Should I Consider Using the Exchange/Sale Authority? and § 102-39.30, How Do I Request a Deviation From This Part?, NASA aircraft cannot be exchanged or sold. Requests accompanied by written justifications for deviation from the prohibition shall be coordinated through the NASA AD and the NASA Property Disposal Officer (PDO). [533] NASA Headquarters Office of Strategic Infrastructure will coordinate the necessary approvals from GSA. In addition, the exchange/sale authority (41 C.F.R. 102-39.65, What Conditions Apply to the Exchange/Sale of Personal Property?) can only be used if the NASA activity meets all of the following conditions:

- a. The property exchanged or sold is similar to the property acquired.
- b. The property exchanged or sold is not excess or surplus, and a continuing need exists for similar property.
- c. The property exchanged or sold was not acquired for the principal purpose of exchange or sale.
- d. When replacing personal property, the exchange allowance or sales proceeds from the disposition of that property can be used only to offset the cost of the replacement property, not services.
- e. Aircraft with an FAA Certificate of Airworthiness. When an aircraft that has an FAA Certificate of Airworthiness is removed from the inventory, the Certificate shall be removed from the aircraft and forwarded to the HQ AD for disposition, unless the aircraft is transferred to another Government agency that intends to operate it or it is sold through GSA to a civil operator. [534]

8.4.2 Aircraft without an FAA Certificate of Airworthiness. When an aircraft is removed from the inventory that is not capable of obtaining an FAA Certificate of Airworthiness or is deemed by the Center's Flight Operations Office to be unsafe for civil use, the manufacturer's data plate shall be removed and forwarded to the HQ AD for disposition. [535] Every effort will be made, including destruction of the aircraft, to ensure that aircraft parts that are not FAA certified are kept out of circulation.

8.5 Aircraft Inventory

8.5.1 In accordance with Chapter 2 of NPR 4200.1, Centers shall conduct annual physical inventories of Center-owned aircraft, including display aircraft, parts aircraft, and aircraft in flyable or non-flyable storage, to determine the accuracy of the records and the NEMS control system. [536] Adjustments will be made to ensure that financial statements are accurate.

Chapter 9. Inter-Center Aircraft Operations Review Program

9.1 Purpose

9.1.1 The NASA Inter-Center Aircraft Operations review program provides peer review and an objective management evaluation of the procedures and practices that are being used at the operating Centers to ensure safe and efficient accomplishment of assigned missions and goals. In addition to providing Center Directors and HQ management officials with an overview of the general health of all aspects of flight operations, the review teams also identify deficiencies in, or deviations from, NASA wide policies, procedures, and guidelines. Results of the reviews shall be used to update NASA-wide or local requirements in order to enhance standardization and improve productivity. [537] The evaluations are conducted primarily by Inter-Center team members and, thus, are a valuable method of communicating current information among Center Flight Operations personnel. (See Appendix D for an example review plan and Appendix E for the review sheet.)

9.2 Responsibilities

9.2.1 It is important that the Inter-Center Aircraft Operations Panel support the review program. The HQ AD shall establish inter-Center review teams to review all aspects of flight operations at NASA Centers, including the implementation of Center procedures, either biennially or as determined by the HQ AD. [538] The Centers and appropriate HQ offices (e.g., AD, Aviation Safety) will provide personnel to serve on the teams. The HQ AD will coordinate the review program.

9.3 Procedures

9.3.1 In conducting reviews, including special or directed reviews, the following guidelines will be used:

9.3.1.1 A review team will include a team leader who is a member of the IAOP and either a Center Flight Operations Chief or deputy. Seven to twelve team members selected from various Centers and HQ provide expertise in the areas of operations, maintenance, QA, avionics, and aviation safety. The mix of members will vary for each review. The HQ AD will provide a member for each review who is responsible for analyzing management practices and special interest items. In addition, the OSMA will provide a member for each review who is responsible for aviation safety compliance. The HQ AD will maintain a current review schedule.

9.3.1.2 HQ AD will write a memo to the appropriate Center Director listing the scope and time of the review and requesting a briefing on the Center's Flight Operations program.

9.3.1.3 Depending on the level of flight activity at a Center, the reviews should be completed within 3-to-5 days. The team leader will ensure that sufficient time is spent at the site for a thorough review. All reviews will begin with a team entrance briefing and conclude with an exit debriefing between the review team and the Center Director or the deputy. At the entrance briefing, the team leader will introduce the team members and explain the scope and purpose of the review.

9.3.1.4 The entrance briefing given by the Center to the review team shall be comprehensive. Local operations and maintenance documents will be made available to the team, and the team members

will familiarize themselves with the documents before performing field work. [539]

9.3.2 Instructions for reviewers shall ensure compliance with established standards, including FAA, DoD, manufacturer, industry, and association standards. [540]

9.3.3 The HQ AD will maintain updated IAOP review checklists. Review checklists will be made available to each review team member to use as a guideline to ensure compliance with applicable instructions. Team members will discuss findings and recommendations with the affected Center party to ensure a mutual understanding of the observations. Minor discrepancy items will be brought to the attention of the first-line supervisor for immediate corrective action. The team leader shall hold daily team progress meetings to discuss discrepancies and recommendations. [541]

9.3.4 The team leader's exit briefing shall be in sufficient detail to inform Center management of the status of local Flight Operations activities with particular emphasis on significant findings and recommendations requiring management's attention. [542]

9.3.5 The review team shall document results in a brief report that focuses on significant findings and recommendations. [543] The review report will address those items that require senior management's attention and also identify those activities that are being performed in an outstanding manner. Criticality criteria will be used to assist management in prioritizing responses as follows: Required Action, Recommendation, and Commendable Finding. Required Actions must cite the specific requirement that is not being met. The report shall be forwarded by the review team leader to the Assistant Administrator for the Office of Strategic Infrastructure with a copy to the Center Director. [544]

9.3.6 The Center Director shall respond to the Assistant Administrator for the Office of Strategic Infrastructure concerning corrective actions. [545] The HQ AD will review the response for adequacy, follow up as necessary, track recommendation responses, and close out the report.

Chapter 10.

<RESERVED>

Chapter 11. Flight Operations Performance Measurements and Reporting

11.1 Purpose

11.1.1 The primary objective of measuring aircraft operations is to provide Agency stakeholders with the key indicators of aircraft operational effectiveness and safety. A secondary objective is to meet the reporting requirements of OMB Circular A-126 and GSA for collection of aircraft information, including aircraft cost data.

11.2 Responsibilities

11.2.1 Center Directors are responsible for reporting the aircraft operational and cost data to the HQ AD and for ensuring that the reported data is accurate and auditable.

11.2.2 The HQ AD is responsible for compiling Center inputs into an annual Agency aircraft report, as well as submitting compiled aircraft information to GSA.

11.3 Aircraft Data Reporting Requirements

11.3.1 General. Centers shall use the NASA Aircraft Cost and Performance worksheets in Appendix G to report aircraft data to HQ AD within 45 days after the end of each quarter. [546]. This data-reporting requirement is only for capitalized aircraft assets (as defined in NPR 9020.1, Definitions of Financial Management Terms) and excludes experimental projects; i.e., X-type aircraft. Aircraft data reporting consists of the following:

11.3.1.1 Aircraft Inventory Data Reporting. Centers shall use the Aviation Inventory Report worksheet in Appendix G to report the number and type of aircraft operated. [547] Aircraft value requested will be the capitalized values recorded in the NEMS database. Additional blank sheets may be used in addition to the comment block of the attached Aviation Inventory Data worksheet to highlight projects, programs, or campaigns supported during the fiscal year. For contracted Commercial Aviation Services (CAS), Centers will provide information on only the aircraft flown, hours flown, utilization category, program supported, and contract performance period. CAS includes leased aircraft, chartered aircraft, fractional ownership aircraft, otherwise-contracted aircraft, and aircraft services provided by other agencies.

11.3.1.2 Aircraft Performance Data Reporting. The Centers shall use the NASA Aircraft Cost and Performance worksheets in Appendix G to report aircraft operational data, unless an Agency-wide aircraft operations data-reporting system is utilized. [548] Due to the different natures of aircraft operations, two Aircraft Cost and Performance worksheets will be used--one for passenger transportation and another for all other NASA operations.

11.3.1.3 Aircraft Safety Data. The Centers shall use the Aircraft Cost and Performance worksheets in Appendix G-4 to report aircraft operational safety metrics, unless an Agency-wide aviation safety reporting system is utilized. [549] Costs of mishaps must be reported to the nearest dollar.

11.3.1.4 Aircraft Cost Data Reporting. The Centers shall use the Aircraft Cost and Performance worksheets in Appendix G-5 to report aircraft costs, including contracted CAS. [550] Accrued costs,

as opposed to disbursements or obligations, must be reported for each aircraft type operated during the fiscal year. One worksheet will be used to report one aircraft type and primary mission utilization category. Using the F/A-18 example, one worksheet is to be used for F/A-18 (PS) and another for F/A-18 (R&D). Costs must be reported to the nearest dollar.

a. The first priority in assembling aircraft costs is to extract cost data, using aircraft function codes defined in NASA Financial Management Policy directives and procedural requirements, from the Core Finance Business Warehouse and to verify the accuracy of the aircraft cost data extracted. While it is not necessary to backtrack and correct the data in the Business Warehouse to report costs as requested, any data errors observed in the Business Warehouse and any data adjustments necessary to formulate and report accurate aircraft costs must be documented. Center CFOs shall implement actions to correct any financial errors uncovered in the Business Warehouse. [551]

b. In most cases, cost data extracted using aircraft function codes from the Core Finance Business Warehouse should be further broken down and allocated into the reportable aircraft cost categories on the Aircraft Cost and Performance worksheets. Each Center will establish and document local processes and the underlying rationale used to assess the Business Warehouse aircraft cost data into reportable cost categories.

c. The data requested in the Aircraft Cost and Performance worksheets is based on the November 2002 revision of the U.S. Government Aircraft Cost Accounting Guide published by GSA. The Aircraft Cost and Performance worksheets breaks costs into three broad categories: investment expenditures, fixed costs, and variable costs. Investment expenditures are expenses that lead to ownership of an aircraft or major asset. Fixed costs are those that would be incurred whether aircraft are flown or not. Typical fixed costs are calendar based; e.g., depot maintenance. Variable costs are those incurred as aircraft are flown. Typical variable costs are flight hour based; e.g., fuel.

Chapter 12. Assignment and Removal from Flight Status

12.1 Purpose

12.1.1 Aircrew members are assigned to flight status with approval from Center Directors and concurrence from HQ AD and the Center's Human Resources Office. Aircrew members may be removed from flight status on a temporary or permanent basis subsequent to mishap or high-visibility Close Calls, as defined in NPR 8621.1. These procedures are not intended to replace those applicable to events classified as Close Calls, pursuant to NPR 8621.1. Removal from flight status does not apply to medical disqualification (temporary or permanent).

12.2 Assignment Procedures

12.2.1 In general, designated NASA pilots/aircrew are those who perform piloting/aircrew duties as a part of their official position description or fly in accordance with an interagency agreement, such as a military pilot on loan to NASA. To be eligible to be assigned to flight status, aircrew members shall meet all applicable requirements of Chapters 3 and 4, any additional Center requirements, and will be assigned as either of the following:

- a. GS-2181, Aircraft Operations Series.
- b. GS-0861, Aerospace Engineering Series.
- c. Meet the applicable series and grade requirements of the OPM qualification standard for a GS-2181, Aircraft Operations Series, in addition to the requirements in Chapters 3 and 4. Any waivers within this OPM qualification standard shall be approved only by the Assistant Administrator for the Office of Strategic Infrastructure. [552]

12.2.2 All series and grade requirements of OPM qualification standard for a GS-2181 apply to new hires (including contracted pilots flying NASA-owned aircraft) and current NASA pilots. Selecting officials may consider new hires who do not meet recency requirements when these candidates are otherwise qualified for the position and exceed all other GS-2181 series and grade requirements. For current NASA pilots, recency requirements in Chapters 3 and 4 apply.

12.2.3 Each Center Director and Chief of Flight Operations, in close coordination with the Center's Human Resources Office, shall establish a process to designate pilots and aircrew. [553] At a minimum, the process will include reviewing experience, FAA licenses/military designations, and flight log books in relation to the Center's flight requirements. To qualify for assignment as a NASA pilot of manned aircraft, only manned aircraft time shall apply. [554]

12.2.4 Each Center's Chief of Flight Operations shall establish procedures for assignment of aircrew to flight status and document those procedures in the Center Aviation Operations Manual. [555] Fully qualified NASA pilots may be assigned as UAS pilots, but for UAS pilots to fly manned NASA aircraft, they shall meet NASA pilot qualification minimums. [556] In addition, appropriate documentation should be contained in the aircrew member's official position description, per human resources procedures.

12.3 Removal Procedures

12.3.1 Each Center's Chief of Flight Operations shall establish procedures for temporary removal of aircrew personnel from flight status for situations other than medical disqualification (Chapter 7). [557] These procedures will be coordinated with the Center's human resources and legal offices. Chiefs of Flight Operations may, after consultation with the Center's legal and human resources offices, remove any aircrew member from flight status for 30 days or less. The Center Director, in accordance with human resources procedures, shall review and approve any non-medical-related proposal for removal from flight status in excess of 30 days. [558] Contract employee flightcrew members will be treated in accordance with the terms of the contract under which they are employed.

12.3.2 Prior to any action to removing aircrew members from flight status, the Chief of Flight Operations and Center Director will inform the aircrew member of the circumstances leading to the action. The Center Director and the Chief of Flight Operations, in close coordination with the Center's human resources office will determine how this action affects the member's ability to perform the duties, per the position description.

12.3.3 Removal from flight status can result from either a single event or multiple events that indicate the aviator has demonstrated:

- a. Faulty judgment in flight situations.
- b. Lack of general or specific flight skills.
- c. Traits of character, emotional tendencies, or lack of mental aptitude or motivation that make it questionable to continue the member in assigned flying duties.

12.3.4 If the reason for removing the individual from flight status is an event that is properly classifiable as a Close Call, pursuant to NPR 8621.1, the process for investigation described therein shall be followed. [559] The results of that investigation will be used by management in determining the future assignment of flight duties to an individual that is the subject of an investigation, under NPR 8621.1.

12.3.5 Flight Performance Board. A Flight Performance Board may be convened if the Chief of Flight Operations deems the circumstances warrant such action. The board should be convened within 90 days of removal from flight status. The HQ AD can provide board membership recommendations upon request. The Chief of Flight Operations is the convening authority unless he/she is the direct supervisor of the individual that is the subject of the removal; in which case, the convening authority would be the Center Director. The convening authority will consult with the Center's legal and human resources offices, and HQ AD prior to establishing a board. Membership will be based upon the circumstances of each individual case. It is preferred that board members have experience as qualified aircrew members and be selected for the board based on their objectivity, experience, and a clear understanding of NASA's aviation mission. No Flight Performance Board should be formed for events that are properly classifiable as a Close Call, pursuant to NPR 8621.1.

12.3.5.1 Advisors may be assigned to the board at the discretion of the convening authority. Advisors will perform such duties as the board may require and may be included in deliberations at the board chair's discretion. At a minimum, one from each of the following specialties should be assigned as advisors:

- a. Flight surgeon.
- b. Legal counsel.

c. Aviator from the Center's flight operations.

12.3.5.2 If a Flight Performance Board is convened, a flight status recommendation shall be delivered to the Center Director. [560] In the event that the board recommends removal from flight status, the recommendation should include a discussion on extenuation and mitigation factors that address the member's rehabilitation value. For example, remediation efforts for "faulty judgment in flight situations" or "lack of general or specific flight skills" may be corrected by appropriate training. "Traits of character, emotional tendencies, or lack of mental aptitude or motivation that makes it questionable to continue the member in assigned flying duties" may be remediated through counseling. Prior to permanent removal from flight status, an opportunity should be provided to the member for correcting deficiencies noted by a Flight Performance Board.

Chapter 13. NASA Airfield Operations

13.1 General Requirements

13.1.1 A Center shall not operate an airfield (or helicopter landing area) unless the Center adopts and complies with an Airfield Operations Manual, in accordance with paragraph 13.2. [561]

13.1.2 Each Center operating an airfield shall ensure that the FAA Regional Airports Division Manager is provided a complete copy of the Center's most current Airfield Operations Manual. [562]

13.1.3 Centers providing access to their airfield to the general public for aircraft operations conducted under civil regulations shall identify all deviations and noncompliance from 14 C.F.R. § 139, Certification of Airports, and provide this information to the Office of Strategic Infrastructure for approval. [563] This information also will be provided to all aircraft operators using the airfield.

13.1.4 Centers will establish and maintain a Pre-Mishap Plan/Aircraft Incident Response Plan, in accordance with NPR 8621.1, that meets the following requirements:

- a. Each Center shall develop and maintain an airfield emergency plan designed to minimize the possibility and extent of personal injury and property damage on the airfield in an emergency. [564]
- b. Each Center shall coordinate the plan with law enforcement agencies, rescue and firefighting agencies, medical personnel and organizations, the principal tenants at the airfield, and all other persons who have responsibilities under the plan. [565]
- c. At least once every 12-consecutive calendar months, the plan shall be reviewed with all the parties with whom the plan is coordinated, as specified in this NPR, to ensure that all parties know their responsibilities and to ensure that all information in the plan is current. [566]
- d. Each Center shall hold a full-scale airfield emergency plan exercise at least once every 24-consecutive calendar months. [567]

13.1.5 Centers shall conduct training needed to meet the following requirements:

- a. Providing sufficient and qualified personnel to comply with the requirements of this NPR.
- b. Equipping personnel with sufficient resources to comply with the requirements of this NPR.
- c. Training all personnel who access movement areas and safety areas and perform duties in compliance with the requirements of the Airfield Operations Manual and the requirements of this NPR. [568]

13.1.5.1 This training will be completed prior to the initial performance of such duties and at least once every 12 consecutive calendar months.

13.1.6 All NASA Centers operating airfields or aircraft ramp areas shall conduct a Pavement Condition Index (PCI) survey at least once every 5 years. [569]

13.1.7 Airfield-condition reporting shall be conducted in a manner authorized by the Center Director and meet the following requirements:

- a. Provide for the collection and dissemination of airfield condition information to aircraft operators, including alerts on bird and other wildlife activity.

- b. Use the Notices to Airmen (NOTAM) system, as appropriate, and other systems and procedures authorized by the FAA.
- c. Provide information on the following airfield conditions that may affect the safe operations of aircraft:
- (1) Construction or maintenance activity on movement areas, safety areas, or loading ramps and parking areas.
 - (2) Surface irregularities on movement areas, safety areas, or loading ramps and parking areas.
 - (3) Snow, ice, slush, or water on the movement area or loading ramps and parking areas.
 - (4) Snow piled or drifted on or near movement areas.
 - (5) Objects on the movement area or safety areas.
 - (6) Malfunction of any lighting system, holding position signs, or Instrument Landing System (ILS) critical area signs.
 - (7) Unresolved wildlife hazards.
 - (8) Non-availability of any rescue and firefighting capability required.
 - (9) Any other condition specified in the Airfield Certification Manual or that may otherwise adversely affect the safe operation of aircraft.
 - (10) Procedures for identifying, marking, and lighting construction and other unserviceable areas.
 - (11) Any other item that the Center Director finds is necessary to ensure safety in airfield operations.
- [570]

13.2 Contents of Airfield Operations Manual

13.2.1 Each Center shall maintain an Airfield Operations Manual that includes descriptions of operating procedures, facilities and equipment, responsibility assignments, and any other information needed by personnel concerned with operating the airfield. [571] FAR, FAA advisory circulars, and the National Fire Protection Association (NFPA) standards contain acceptable methods and procedures for the development of a Center's Airfield Operations Manual.

13.2.2 Each Center shall include in the Airfield Operations Manual the following required elements:

- a. Lines of succession of airfield operational responsibility.
- b. Copies of current waivers, variances, or deviations issued to the airfield.
- c. Any limitations imposed by the Administrator.
- d. A grid map or other means of identifying locations and terrain features on and around the airfield that are significant to emergency operations.
- e. The location of each obstruction within the airfield's area of authority required to be lighted or marked.
- f. A description of all movement areas that are available for civil and public aircraft operators and the airfield's safety areas and all roads that serve them.

- g. Procedures for avoidance of interruption or failure during construction work of utilities that serve facilities or NAVAIDS that support aircraft operations.
- h. A description of airfield personnel training detailed in paragraph 13.1.5.
- i. Procedures for maintaining paved areas.
- j. Procedures for maintaining unpaved areas.
- k. Procedures for maintaining safety areas.
- l. A plan showing the runway and taxiway identification system, including the location and inscription of signs, runway markings, and holding-position markings.
- m. A description of marking, signs, and lighting systems and procedures for maintaining them.
- n. A snow and ice control plan. Prompt notification will be given to all aircraft operators using the airfield when any portion of the movement area is less than satisfactorily cleared for safe operation of their aircraft.
- o. A description of the facilities, equipment, personnel, and procedures for meeting the aircraft rescue and firefighting requirements detailed in paragraph 13.3.
- p. Procedures for protecting persons and property during storing, dispensing, and handling fuel or other hazardous substances and materials.
- q. A description of traffic and wind direction indicators and procedures for maintaining them.
- r. The Pre-Mishap Plan/Aircraft Incident Response Plan, as specified in paragraph 13.1.4.
- s. Procedures for conducting a biennial self-inspection program.
- t. Procedures for controlling pedestrians and ground vehicles in movement areas and safety areas.
- u. Procedures for obstruction removal, marking, or lighting.
- v. Procedures for protection of NAVAIDS.
- w. A description of public protection.
- x. Procedures for wildlife hazard management, as specified in Section 13.4.
- y. Airfield condition reporting procedures, as specified in Section 13.1.6. [572]

13.3 Safety and Emergency Requirements

13.3.1 Centers will provide and maintain facilities, equipment, personnel, and procedures for meeting the aircraft rescue and firefighting requirements, in accordance with NPR 8715.3 and NASA-STD-8719.11, Safety Standard for Fire Protection, for the capacity of aircraft and the level of aircraft operations being conducted at the airfield.

13.3.1.1 Each Center shall provide on the airfield, during aircraft operations at the airfield, at least the rescue and firefighting capability specified for the level of operations. [573]

13.3.1.2 In the event that fire protection is temporarily not available due to lack of personnel, equipment, or other emergencies, the Center shall establish procedures to restrict the use of the airfield and notify aircraft operators of the temporary suspension of airfield operations. [574]

13.3.1.3 All rescue and firefighting personnel shall participate in at least one live-fire drill prior to initial performance of rescue and firefighting duties and every 12 consecutive calendar months thereafter. [575]

13.4 Wildlife Hazard Management

13.4.1 Each Center shall take immediate action to eliminate wildlife hazards whenever they are detected. [576]

13.4.2 Each Center shall ensure that a wildlife hazard assessment is conducted by a wildlife damage management biologist who has professional training and/or experience in wildlife hazard management at airfields or an individual working under direct supervision of such an individual. [577]

13.4.3 Each Center shall conduct a training program by a qualified wildlife damage management biologist to provide airfield personnel with the knowledge and skills needed to successfully carry out the required wildlife hazard management plan. [578]

13.4.4 Each Center shall track and report all bird strikes and other wildlife strikes either in the Incident Reporting Information System (IRIS) or the NASA Aircraft Anomaly Reporting System (NAARS) in accordance with NPR 8621.1. [579]

13.4.5 Each Center shall conduct a periodic review of bird hazards using a team similar to the U.S. Air Force Bird/Wildlife Aircraft Strike Hazard (BASH) team. [580]

13.4.6 Each Center shall develop a wildlife hazard management plan using the wildlife hazard assessment as a basis. [581] The plan will:

- a. Provide measures to eliminate wildlife hazards to aircraft operations.
- b. Become a part of the Airfield Operations Manual.
- c. Include a list of the individuals having authority and responsibility for implementing each aspect of the plan.
- d. Include a list prioritizing the actions in Table 13-1, Wildlife Hazard Assessment, and specifying target dates for their initiation and completion.
- e. Provide procedures to review and evaluate the wildlife hazard management plan every 12 consecutive months or following an event described in this section, including the plan's effectiveness in dealing with known wildlife hazards on and in the airfield's vicinity and aspects of the wildlife hazards described in the wildlife hazard assessment that should be reevaluated.

Table 13-1 Wildlife Hazard Assessment

- | |
|--|
| <ol style="list-style-type: none"> 1. Wildlife population management. 2. Habitat modification. 3. Land-use changes. 4. Requirements for and, where applicable, copies of local, State, and Federal wildlife control permits. 5. Identification of resources that the Center will provide to implement the plan. 6. Procedures to be followed during aircraft operations that, at a minimum, include: <ol style="list-style-type: none"> a. Provisions to conduct physical inspections of the aircraft movement areas and other |
|--|

areas critical to successfully manage known wildlife hazards before air carrier operations begin.

- b. Wildlife hazard control measures.
- c. Methods to communicate effectively between personnel conducting wildlife control or observing wildlife hazards and the air traffic control tower.
- d. Methods for the air traffic control tower to communicate with and provide alerts to aircraft operating in the vicinity of the airfield of wildlife hazards and conditions.
- e. Establishing bird watch conditions to alert crews of the level of potential bird activity.
- f. A standard field brief for all users to view and sign, acknowledging all field operating procedures and hazards at the airfield and local flying area.

13.5 Noncomplying Conditions

13.5.1 Unless otherwise authorized by the Center Director or the FAA (in the case of civil aircraft operations), whenever the requirements of this NPR cannot be met to the extent that uncorrected, unsafe conditions exist on the airfield, the Center shall limit aircraft operations to those portions of the airfield not rendered unsafe by those conditions. [582]

13.6 Deviations

13.6.1 In emergency conditions requiring immediate action for the protection of life or property, the Center may deviate from any requirement of this NPR or the Airfield Operations Manual to the extent required for the emergency. Each Center that deviates from a requirement under this paragraph shall, within 14 days after the emergency, notify HQ AD and OSMA of the nature, extent, and duration of the deviation. [583] All events will be reported in accordance with the criteria and IRIS procedures in NPR 8621.1.

Appendix A. Definitions

A.1 Acquisition. Any means of bringing an aircraft under NASA control or into the property control inventory.

A.2 Aircraft Classification. NASA use of aircraft: Research and Development, Program Support, or Mission Management.

A.3 Aircraft Inventory. Aircraft inventory includes active, flyable storage, parts, and display aircraft.

A.4 Airworthiness. The capability of an aircraft to be operated within a prescribed flight envelope in a safe manner.

A.5 Bailed Aircraft. Any aircraft owned by one entity but under the operational control of another entity for an indefinite period under an agreement that may or may not include financial recompense. Thus, aircraft which are loaned to NASA, or which NASA loans to other entities, are bailed aircraft. As defined by 41 C.F.R. 102-33, Bailed Aircraft means a Federal aircraft that is owned by one executive agency, but is in the custody of and operated by another executive agency under an agreement that may or may not include cost reimbursement. Bailments are executive agency-to-executive agency agreements and involve only aircraft, not services.

A.6 Borrowed Aircraft. As defined by 41 C.F.R. 102-33, Borrowed aircraft are aircraft owned by a non-executive agency and provided to an executive agency for use without compensation. The executive agency operates and maintains the aircraft.

A.7 Center's Chief of Flight Operations. The Center's Chief of Flight Operations is a generic term to indicate that individual who is responsible for overall supervision of all flight operations conducted by that Center, regardless of the specific Center title.

A.8 Chartered Aircraft. An aircraft procured under a one-time exclusive agreement that specifies performance and payment. The vendor operates chartered aircraft. Note: The preceding Inter-Agency Committee on Aircraft Policy's (ICAP) definition does not preclude NASA from specifying what type aircraft they wish to charter nor is a separate agreement required for each flight. As defined by 41 C.F.R. 102-33, Chartered aircraft are aircraft that an executive agency hires commercially under a contractual agreement specifying performance and one-time exclusive use. The commercial source operates and maintains charter aircraft.

A.9 Civil Aircraft. Aircraft that are other than "public," which include military aircraft. This includes aircraft engaged in carrying persons or property for commercial purposes, such as air carrier, commuter, charter, and leased aircraft, and Government aircraft carrying passengers. (Source: 49 U.S.C. §§ 40102 (16), (37))

A.10 Configuration Control. Conformity to type design is considered attained when the aircraft configuration and the components installed are consistent with drawings, specifications, and other data that are part of the type certificate and would include any supplemental type certificates and field-approved alterations incorporated into the aircraft.

A.11 Contracted Aircraft. An aircraft procured for an agency's exclusive use for a specified period of time by means of a formal contract under which the contractor is responsible for the operation, safety, and maintenance of the aircraft.

A.12 Crew Duty Time. The total time a crew is on duty. Crew duty time accrues consecutively and

begins when a crew reports to a designated place of duty to begin preparation for a flight and ends when the engines are cut at the end of the flight or series of flights.

A.13 Crew Rest. The total time flightcrew members are assigned no official duties to provide for adequate rest. This includes crew transportation prior to participating in flightcrew duties.

A.14 Deviation. A documented authorization releasing a program or project from meeting a requirement before the requirement is put under configuration control at the level the requirement will be implemented.

A.15 Disposition. Any means of deleting an aircraft from NASA control or from the property-control inventory.

A.16 Flight Envelope. Aircraft performance limits or limitations approved by the aircraft manufacturer (DoD, FAA) or established by a formal NASA airworthiness review.

A.17 Flight Termination System. A flight termination system (FTS) may be dependent, independent, or self-initiated. A dependent FTS uses its own command and control system to either automatically self-terminate or allow a remote pilot to terminate flight. An independent FTS contains a fully independent transmitter/receiver located onboard the aircraft that is activated remotely typically by a range safety officer. Self-initiated FTSs are typically associated with COTS RC controllers that are activated upon lost link.

A.18 Functional Check Flight Pilot. A PIC who is adequately trained and authorized by the Center's Chief of Flight Operations to conduct Functional Check Flights of Center aircraft.

A.19 Government Aircraft. Any aircraft owned, leased, chartered, or rented and operated by an Executive Agency.

A.20 Hazard Analysis. The technique used to systematically identify, evaluate, resolve, and assess hazards.

A.21 Instructor Pilot. A qualified PIC who is designated by NASA to perform the functions of an instructor in the aircraft. An IP is qualified to instruct and evaluate other pilots.

A.22 Leased Aircraft. An aircraft that the Government has exclusive right (through a financial contract) to use for a specific period of time and for which the procuring agency is responsible for the operation and safety of the aircraft. Maintenance responsibility is defined under the terms of the contract. As defined by 41 C.F.R. 102-33, Leased Aircraft are aircraft hired under a commercial contractual agreement in which an executive agency has exclusive use of the aircraft for an agreed-upon period of time. The acquiring executive agency operates and maintains the aircraft.

A.23 Loaned Aircraft. An aircraft owned by one entity, but under the operational control of another agency under an agreement that does not include financial recompense. As defined by 41 C.F.R. 102-33, "loaned aircraft" are Federal aircraft owned by an executive agency, but in the custody of a non-executive agency under an agreement that does not include compensation.

A.24 Maintenance. Scheduled or unscheduled work on an aircraft that is required to attain or to sustain a state of airworthiness and meets all required standards, practices, and guidelines for airworthiness.

A.25 Mission Management Aircraft. Those administrative aircraft certified by the FAA and used primarily for passenger transport.

A.26 Mission Required. Mission management flights where failure to use a NASA aircraft would have a clear, negative impact on a NASA operational mission, prevent timely response to an aircraft

or spacecraft accident, or threaten the health and safety of NASA personnel, and only when such travel could not be conducted using commercial airlines, chartered aircraft service, or ground transportation to fulfill that mission need.

A.27 Modification. Any alteration, addition, or removal of aircraft structure, components, equipment, computer software, or primary instrumentation.

A.28 Model Aircraft. A subscale aircraft built from balsa wood, plywood, foam, or other lightweight materials that is typically flown by means of a commercial off-the-shelf radio control (RC) flight controller. Model aircraft are designed to be operated within visual line of sight of the controlling pilot. Model aircraft typically operate at a Takeoff Gross Weight (TOGW) less than or equal to 55 pounds.

A.29 NASA Aircraft. Aircraft that are bought, borrowed, chartered, rented, or otherwise procured or acquired--including aircraft produced with the aid of NASA funding--regardless of cost, from any source for the purpose of conducting NASA science, research, or other missions, and which are operated by NASA or whose operation is managed by NASA. Unmanned aircraft are defined as "aircraft" by the FAA and are included in the definition of NASA aircraft, unless specified otherwise.

A.30 NASA Inter-Center Aircraft Operations Panel. The IAOP is composed of the Chiefs of Flight Operations from Centers that operate aircraft, representatives from HQ AD, advisors from appropriate Centers, and the OSMA.

A.31 Other Official Travel. Mission management flights that are not classified as Required Use or Mission Required.

A.32 NASA Pilot. Pilots who perform piloting duties as a part of their official NASA position description to fulfill NASA contract requirements or in accordance with an interagency agreement, such as a military pilot on loan to NASA.

A.33 Observer. An individual who is a primary crew member for UAS flight operations. The observer serves as the flight safety monitor to ensure noninterference between the unmanned aircraft and nonparticipating aircraft by means of see and avoid. The observer may perform these duties either on the ground or in a chase aircraft while in direct communication with the controlling pilot. Daisy chain observer operations are limited to 5 NM between the pilot in command and the airborne unmanned aircraft.

A.34 Pilot Flying. The pilot physically controlling the aircraft by hand-flying it or manipulating the controls through the autopilot.

A.35 Pilot in Command. A NASA pilot who holds the appropriate category, class, and, if appropriate, type rating or military qualification for the aircraft and is qualified in its operation by appropriate Center or mission management directives. The PIC has final authority and responsibility for the operation and safety of the flight.

A.36 Pilot-Operator. A pilot-operator (also called Ground Control Operator (GCO) or Internal Pilot) is an individual who manages the operation of an unmanned aircraft by means of a remote flight control station (also called a ground control station or GCS). The pilot-operator typically controls the unmanned aircraft autonomously by means of computer interface with an onboard flight management system (fly-by-mouse) through a command and control communications link. The pilot-operator is the designated pilot in command of the unmanned aircraft (e.g., a Global Hawk pilot).

A.37 Pilot Monitoring. The pilot not currently flying the aircraft, but who is monitoring the other

pilot's and the aircraft's performance and position.

A.38 Primary Aircrew. The required pilot(s), flight engineer, and any other aircrew member so designated by the Center.

A.39 Program Support Aircraft. Aircraft used to support programs and operations other than the direct production and acquisition of data.

A.40 Public Aircraft. Aircraft used only in the service of a Government or a political subdivision. It does not include Government owned aircraft engaged in carrying persons or property for commercial purposes. (Source: 49 U.S.C. §§ 40102 (16), (37))

A.41 Qualified Non-Crewmember. An individual other than a member of the crew whose presence is required to perform, or is associated with the performance of, the mission the aircraft is supporting.

A.42 Quality Assurance. The act of attaining certainty that maintenance performed on aircraft meets all required airworthiness standards, regulations, practices, and guidelines.

A.43 Required Use. Passenger transportation mission management flights where the use of Government aircraft is required because of bona fide communications or security needs or exceptional scheduling requirements.

A.44 Radio Control Pilot. The RC Pilot (also called Safety Pilot or External Pilot) is an individual who operates an unmanned aircraft by means of a remotely located, manually operated radio-controlled flight management system (direct control by means of stick-to-surface interface). The flight controller is typically commercial off-the-shelf RC hobby equipment. Radio frequencies associated with the command and control function of the system are typically in the unlicensed spectrum suite (72 MHz, 900 MHz, or 2.4 GHz). The RC Pilot is the designated PIC of the unmanned aircraft. An RC Pilot also may perform crewmember duties of a safety (or external) pilot who acts as a fail safe to an unmanned aircraft system that is normally controlled by a pilot-operator. The safety (or external) pilot flight control system is typically commercial off-the-shelf RC hobby equipment that may be either stand alone or be modified to function as a buddy box. In the buddy box configuration, the safety (or external) pilot controls the unmanned aircraft through the GCS communication link protocol. When the safety (or external) pilot is controlling the unmanned aircraft, that person is considered the PIC. All flight operations are within visual line of sight of the controlling pilot.

A.45 Remote Pilot. Remote Pilot (also called Remotely Operated Aircraft (ROA) or Remotely Piloted Vehicle (RPV) Pilot) is an individual who operates an unmanned aircraft system by means of manual control in a remotely located ground control station. The Remote Pilot typically manages the unmanned aircraft flight path through a command and control communication link using manual stick-and-rudder inputs, a forward looking video camera feed, and a moving map display system located in the GCS. The Remote Pilot is the designated PIC of the unmanned aircraft (e.g., a Predator pilot).

A.46 Research and Development Aircraft. All aircraft directly related to the production or acquisition of data.

A.47 Second in Command. A NASA Pilot who is qualified by NASA to be a SIC of an aircraft by appropriate Center or passenger transportation mission management directives.

A.48 Small Unmanned Aircraft System (sUAS). A model or subscale aircraft designed and built to operate with an onboard flight management system. Small UASs may carry a variety of payloads and operate using either licensed or unlicensed spectrums for command and control. sUASs can be

operated via a manual control, manually via an onboard flight management system, or autonomously.

A.49 State Aircraft. NASA aircraft being operated as public use in international airspace under diplomatic clearances are considered State Aircraft, per U.S. Department of State guidance.

A.50 Unmanned Aircraft System (UAS). A UAS is any airborne vehicle system without a pilot onboard that is controlled autonomously by an onboard control and guidance system or is controlled from a monitoring station outside of or remote from the UAS vehicle. A UAS is defined as an aircraft by the FAA. UASs also can be operated via a remotely located, manually operated flight control system or ground control system.

A.51 Waiver. A documented authorization releasing a program or project from meeting a requirement after the requirement is put under configuration control at the level the requirement will be implemented.

Appendix B. Acronyms

A&PP	Airframe and Power Plant
ACA	Airspace Coordination Areas
AD	Aircraft Division
AD	Airworthiness Directives
AFSRB	Airworthiness and Flight Safety Review Board
AGL	Above Ground Level
AME	Aviation Medical Examiner
AO	Area of Operations
ARB	Airworthiness Review Board
ARP	Airworthiness Review Process
ASM	Aviation Safety Manager
ASO	Aviation Safety Officer
ATC	Air Traffic Control
ATP	Airline Transport Pilot
BASH	(U.S. Air Force) Bird/Wildlife Aircraft Strike Hazard
BCA	Business Case Analysis
BLOS	Beyond Line of Sight
CAD	Cartridge-Activated Device
CALSTD	Calibration Standard
CAS	Commercial Aviation Services
CCP	Configuration Control Process
CFIT	Controlled Flight into Terrain
CFO	Chief Financial Officer
CFR	Crash Fire Rescue
CONUS	Continental United States
COTR	Contracting Officer Technical Representative
COTS	Commercial Off-the-Shelf
CVR	Cockpit Voice Recorder

DA	Decision Altitude
DoD	Department of Defense
DoT	Department of Transportation
EGPWS	Enhanced Ground Proximity Warning System
EMI	Electromagnetic Interference
EOP	Executive Office of the President
ESD	Electrostatic Discharge
ETA	Estimated Time of Arrival
FAA	Federal Aviation Administration
FAIRS	Federal Aviation Interactive Reporting System
FAR	Federal Aviation Regulations
FBI	Federal Bureau of Investigation
FCF	Functional Check Flight
FCG	Foreign Clearance Guide
FDR	Flight Data Recorder
FECA	Federal Employees' Compensation Act
FMR	Financial Management Requirements
FOD	Foreign Object Damage
FRR	Flight Readiness Review
FSCAP	Flight Safety Critical Aircraft Parts
FTR	Federal Travel Regulation
FTS	Flight Termination System
GCO	Ground Control Operator
GCS	Ground Control Station
GIDEP	Government-Industry Data Exchange Program
GPS	Global Positioning System
GSA	General Services Administration
GSE	Ground Support Equipment
HQ	Headquarters
HN	Host Nation
IAOP	Inter-Center Aircraft Operations Panel

IAW	In Accordance With
ICAO	International Civil Aviation Organization
ICAP	Inter-Agency Committee on Aircraft Policy
IG	Inspector General
ILS	Instrument Landing System
IMC	Instrument Meteorological Conditions
IP	Instructor Pilot
IRIS	Incident Reporting Information System
JPL	Jet Propulsion Laboratory
KSC	John F. Kennedy Space Center
LOFT	Line Oriented Flight Training
LOS	Line of Sight
LRU	Line Replaceable Unit
MDA	Minimum Descent Altitude
MEL	Minimum Equipment List
METCAL	Metrology and Calibration
MNPS	Minimum Navigation Performance Specifications
MOA	Memorandum of Agreement
MOU	Memorandum of Understanding
MRR	Mission Readiness Review
MSL	Mean Sea Level
NAARS	NASA Aircraft Anomaly Reporting System
NALCOMIS	Naval Aviation Logistics Command Management Information System
NAMIS	NASA Aircraft Management Information System
NAS	National Airspace
NASA	National Aeronautics and Space Administration
NAVAIDS	Navigational Aids
NESC	NASA Engineering Safety Center
NEMS	NASA Equipment Management System
NFPA	National Fire Protection Association
NOTAM	Notices to Airmen

NPD	NASA Policy Directive
NODIS	NASA Online Directives Information System
NPR	NASA Procedural Requirements
NTSB	National Transportation Safety Board
OEM	Original Equipment Manufacturer
OPM	Office of Personnel Management
OSHA	Occupation Safety and Health Administration
OMB	Office of Management and Budget
ORR	Operations Readiness Review
OSMA	Office of Safety and Mission Assurance
OTI	One-Time Inspections
PAD	Propellant Actuated Device
PCI	Pavement Condition Index
PCS	Portable Control Station
PDM	Programmed Depot Maintenance
PIC	Pilot in Command
PIP	Product Improvement Publications
PPB	Power Plant Bulletin
PPC	Power Plant Change
PS	Program Support
QAI	Quality Assurance Inspector
R&D	Research and Development
RA	Resolution Advisories
RAC	Risk Assessment Code
RC	Radio Control
RNAV	Random Area Navigation
RNP	Required Navigation Performance
ROA	Restricted Operations Areas
ROA	Remotely Operated Aircraft
ROZ	Restricted Operations Zones
RPV	Remotely Piloted Vehicle

RVR	Runway Visual Range
RVSM	Reduced Vertical Separation Minimum
SB	Service Bulletin
SDLM	Scheduled Depot Level Maintenance
SEMO	Supply and Equipment Management Officer
SES	Senior Executive Service
SI	Service Instruction
SIC	Second in Command
SM	Statute Mile
SODA	Statements of Demonstrated Ability
SOP	Standard Operating Procedure
STC	Supplemental Type Certificate
sUAS	Small Unmanned Aircraft System
SUA	Special Use Airspace
SUP	Suspected Unapproved Parts
TAWS	Terrain Awareness and Warning System
TCAS	Traffic Alert and Collision Avoidance System
TCP	Tool Control Program
TCTO	Time Compliant Technical Order
TD	Technical Directive
TDY	Temporary Duty
TO	Technical Order
TOGW	Takeoff Gross Weight
UAS	Unmanned Aircraft System
VMC	Visual Meteorological Conditions
W&B	Weight and Balance

Appendix C. Flight on Public Aircraft

C-1 Flying on Public Aircraft (Crewmembers and Qualified Non-Crewmembers)

Subject: Disclosure Statement for Crewmembers and Qualified Non-Crewmembers Flying on Board Government Aircraft Operated as Public Aircraft.

Reference: 41 C.F.R. 102-33, Management of Government Aircraft, section 102-33.165; (e)

Crewmembers and qualified non-crewmembers flying on board Government aircraft operated as either civil or public aircraft on the behalf of NASA shall have on file in Flight Operations a record of acknowledgement of the following disclosure statement:

Generally, an aircraft used exclusively for the U.S. Government may be considered a “public aircraft” as defined in Public Law 106-181, Wendell H. Ford Aviation Investment and Reform Act for the 21st Century, provided it is not a Government-owned aircraft transporting passengers or operating for commercial purposes. A public aircraft is not subject to many Federal Aviation Regulations, including requirements relating to aircraft certification, maintenance, and pilot certification. If an agency transports passengers on a Government-owned aircraft or uses that aircraft for commercial purposes, the agency must comply with all Federal Aviation Regulations applicable to civil aircraft. If you have any questions concerning whether a particular flight will be a public aircraft operation or a civil aircraft operation, you should contact the agency sponsor of that flight.

You have certain rights and benefits in the unlikely event you are injured or killed while working aboard a Government-owned or -operated aircraft. Federal employees and some private citizens are eligible for workers’ compensation benefits under the Federal Employees’ Compensation Act (FECA). When FECA applies, it is the sole remedy. For more information about FECA and its coverage, consult with your agency’s benefits office or contact the Branch of Technical Assistance at the Department of Labor’s Office of Workers’ Compensation Programs at (202) 693-0044.

State or foreign laws may provide for product liability or “third party” causes of actions for personal injury or wrongful death. If you have questions about a particular case or believe you have a claim, you should consult with an attorney.

Some insurance policies may exclude coverage for injuries or death sustained while working or traveling aboard a Government or military aircraft or while within a combat area. You may wish to check your policy or consult with your insurance provider before your flight. The insurance available to Federal employees through the Federal Employees Group Life Insurance Program does not contain an exclusion of this type.

If you are the victim of an air disaster resulting from criminal activity, Victim and Witness Specialists from the Federal Bureau of Investigation (FBI) and/or the local U.S. Attorney’s Office will keep you or your family informed about the status of the criminal investigation(s) and provide you or your family with information about rights and services, such as crisis intervention, counseling, and emotional support. State crime victim compensation may be able to cover crime-related expenses, such as medical costs, mental health counseling, funeral and burial costs, and lost wages or loss of support. The Office for Victims of Crime (an agency of the Department of Justice) and the U.S. Attorney’s Office are authorized by the Antiterrorism and Effective Death Penalty Act of 1996 to provide emergency financial assistance to State programs for the benefit of victims of terrorist acts or mass violence.

If you are a Federal employee. If you are injured or killed on the job during the performance of duty, including while traveling or working aboard a Government aircraft or other Government-owned or -operated conveyance for official Government business purposes, you and your family are eligible to collect workers' compensation benefits under FECA. You and your family may not file a personal injury or wrongful death suit against the United States or its employees. However, you may have cause of action against potentially liable third parties.

You or your qualifying family member must normally also choose between FECA disability or death benefits, and those payable under your retirement system (either the Civil Service Retirement System or the Federal Employees Retirement System). You may choose the benefit that is more favorable to you.

If you are a private citizen not employed by the Federal Government. Even if the Federal Government does not regularly employ you, if you are rendering personal service to the Federal Government on a voluntary basis or for nominal pay, you may be defined as a Federal employee for purposes of FECA. If that is the case, you and your family are eligible to receive workers' compensation benefits under FECA, but may not collect in a personal injury or wrongful death lawsuit against the United States or its employees. You and your family may file suit against potentially liable third parties. Before you board a Government aircraft, you may wish to consult with the department or agency sponsoring the flight to clarify whether you are considered a Federal employee.

If the agency determines that you are not a "Federal employee," you and your family will not be eligible to receive workmans' compensation benefits under FECA. If you are onboard the aircraft for purposes of official Government business, you may be eligible for workman's compensation benefits under State law. If an accident occurs within the United States or its territories, its airspace, or over the high seas, you and your family may claim against the United States under the Federal Tort Claims Act or Suits in Admiralty Act. If you are killed aboard a military aircraft, your family may be eligible to receive compensation under the Military Claims Act, or if you are an inhabitant of a foreign country, under the Foreign Claims Act.

NOTE: This disclosure statement is not all-inclusive. You should contact your agency's personnel office or, if you are a private citizen, your agency sponsor or point of contact for further assistance.

C-2 Flying on Public Aircraft (Passengers)

Subject: Disclosure Statement for Passengers Flying on Board Government Aircraft Operated as Public Aircraft.

Passengers flying on board Government aircraft operated on the behalf of NASA will have been briefed on the following disclosure statement, and a single-sheet laminated copy of the following disclosure statement shall be made available at each passenger's seat. Each passenger manifest shall be annotated that all passengers were briefed on their rights and benefits.

DISCLOSURE FOR PERSONS FLYING ABOARD FEDERAL GOVERNMENT AIRCRAFT

(41 CFR 300.3, 301.10, and 301.70, Federal Travel Regulation (FTR), Section 301-70.909)

NOTE: The disclosure contained herein is not all-inclusive. You should contact your sponsoring agency for further assistance.

Generally, an aircraft used exclusively for the U.S. Government may be considered a "public aircraft" as defined in 49 U.S.C. 40102 and 40125, unless it is transporting passengers or operating for commercial purposes. A public aircraft is not subject to many Federal Aviation Regulations,

including requirements relating to aircraft certification, maintenance, and pilot certification. If a U.S. Government agency transports passengers on a Government aircraft, that agency must comply with all Federal Aviation Regulations applicable to civil aircraft. If you have questions about the status of a particular flight, you should contact the agency sponsoring the flight.

You and your family have certain rights and benefits in the unlikely event you are injured or killed while riding aboard a Government aircraft. Federal employees and some private citizens are eligible for workers' compensation benefits under the Federal Employees' Compensation Act (FECA). When FECA applies, it is the sole remedy. For more information about FECA and its coverage, consult with your agency's benefits office or contact the Branch of Technical Assistance at the Department of Labor's Office of Workers' Compensation Programs at (202) 693-0044. (These rules also apply to travel on other Government-owned or -operated conveyances such as cars, vans, or buses.)

State or foreign laws may provide for product liability or "third party" causes of actions for personal injury or wrongful death. If you have questions about a particular case or believe you have a claim, you should consult with an attorney. Some insurance policies may exclude coverage for injuries or death sustained while traveling aboard a Government or military aircraft or while within a combat area. You may wish to check your policy or consult with your insurance provider before your flight. The insurance available to Federal employees through the Federal Employees Group Life Insurance Program does not contain an exclusion of this type.

If you are the victim of an air disaster resulting from criminal activity, Victim and Witness Specialists from the Federal Bureau of Investigation (FBI) and/or the local U.S. Attorney's Office will keep you or your family informed about the status of the criminal investigation(s) and provide you or your family with information about rights and services, such as crisis intervention, counseling and emotional support. State crime victim compensation may be able to cover crime-related expenses, such as medical costs, mental health counseling, funeral and burial costs, and lost wages or loss of support. The Office for Victims of Crime (an agency of the Department of Justice) is authorized by the Antiterrorism Act of 1996 to provide emergency financial assistance to State programs, as well as the U.S. Attorney's Office, for the benefit of victims of terrorist acts or mass violence.

If you are a Federal employee:

1. If you are injured or killed on the job during the performance of duty--including while traveling aboard a Government aircraft or other Government-owned or -operated conveyance for business purposes, you and your family are eligible to collect workers' compensation benefits under FECA. You and your family may not file a personal injury or wrongful death suit against the United States or its employees. However, you may have cause of action against potentially liable third parties.
2. You or your qualifying family member must normally also choose between FECA disability or death benefits, and those payable under your retirement system (either the Civil Service Retirement System or the Federal Employees Retirement System). You may choose the benefit that is more favorable to you.

If you are a private citizen not employed by the Federal Government:

1. Even if you are not regularly employed by the Federal Government, if you are rendering personal service to the Federal Government on a voluntary basis or for nominal pay, you may be

defined as a Federal employee for purposes of FECA. If that is the case, you and your family are eligible to receive workers' compensation benefits under FECA, but may not collect in a personal injury or wrongful death lawsuit against the United States or its employees. You and your family may file suit against potentially liable third parties. Before you depart, you may wish to consult with the department or agency sponsoring the flight to clarify whether you are considered a Federal employee.

2. If there is a determination that you are not a Federal employee, you and your family will not be eligible to receive workman's compensation benefits under FECA. If you are traveling for business purposes, you may be eligible for workman's compensation benefits under State law. If the accident occurs within the United States, or its territories, its airspace, or over the high seas, you and your family may claim against the United States under the Federal Tort Claims Act or Suits in Admiralty Act. If you are killed aboard a military aircraft, your family may be eligible to receive compensation under the Military Claims Act or, if you are an inhabitant of a foreign country, under the Foreign Claims Act.

Appendix D. Inter-Center Aircraft Operations Review Plan

Action Item	Responsible Party	Timing
Update annual schedule, designate Team Leaders, and assign Inter-Center team members.	IAOP Chair/ HQ AD	Yearly, amended as required
Notify team members, request travel orders.	HQ AD/Team Leader	6–8 weeks before review
Letter to Center Director.	HQ AD	4–6 weeks before review
Team Leader packet containing IAOP checklist and recent reviews.	HQ AD	2–4 weeks before review
Entrance briefing.	Team Leader	First day of review
Center briefing.	Applicable Center	First day of review
Individual observations and recommendations.	Team Member	During review
Exit briefing.	Team Leader	Last day of review
Write review report and forward to HQ AD.	Team Leader/ HQ AD assist	2–4 weeks after review
Forward Final Report to Center Director.	HQ AD Signature	Within 1 week of receipt
Center Director forwards review report response to AA OSI.	Applicable Center	12 weeks after receipt of report
Analyze response for adequacy, followup, tracking, and closure.	HQ AD	As necessary

Appendix E. NASA Inter-Center Aircraft Operations

Program Review Sheet

FACILITY:

DATE:

AREA REVIEWED: MANAGEMENT OPERATIONS _____

AVIATION SAFETY AVIONICS QA _____

AIRCRAFT MAINTENANCE FACILITIES _____

AIRWORTHINESS/FLIGHT READINESS HAZARD ANALYSIS _____

MAINTENANCE FACILITIES MAINTENANCE TRAINING _____

SECURITY PASSENGER TRANSPORTATION MISSION MANAGEMENT OPERATIONS

TEAM MEMBER: LOCAL CONTACT:

OBSERVATION TITLE:

OBSERVATION (Factual Information):

REQUIRED ACTION, RECOMMENDATION, OR COMMENDABLE FINDING:

Appendix F. Certificate of Airworthiness for Aircraft

[ftp://ftp.hq.nasa.gov[☒]/forms/pdf/nf1677.pdf](ftp://ftp.hq.nasa.gov/forms/pdf/nf1677.pdf)

Appendix G. NASA Aircraft Cost and Performance Worksheets

G-1 NASA Aircraft Cost and Performance Worksheets

G-2 NASA Aircraft Cost and Performance Worksheets

G-3 NASA Aircraft Cost and Performance Worksheets

NASA Aircraft Cost and Performance Worksheets

G-5 NASA Aircraft Cost and Performance Worksheets

Appendix H. Sample Approval Request to Acquire/Transfer/Dispose of Aircraft

TO: Assistant Administrator for the Office of Strategic Infrastructure
FROM: Director, (NASA Center)
SUBJECT: Request Approval to Acquire/Transfer/Dispose (number) (type) Aircraft

Statement of Need. This should be a summary of the reasons for acquiring/transferring/disposing the aircraft, including the program and primary requirements it will satisfy or, in the case of support, the secondary or derived requirements (such as chase, pilot training, cargo) or, on the other hand, discontinued requirements.

Estimated Acquisition/Transfer/Disposal Cost. This should include all the costs associated with providing a resource ready for use by the program. It could be divided into two distinct areas which differentiate the costs associated with obtaining the basic aircraft and placing it into flying condition (such as engine overhauls, aircraft inspections, and programmed depot maintenance/scheduled depot level maintenance (PDM/SDLM)), and the costs of modifying the aircraft to meet generic research or program support requirements, which can be applied to any number of programs (including traffic alert and collision avoidance system (TCAS) or Reduced Vertical Separation Minimum (RVSM) upgrades, or aircraft system modifications that make it a better platform in general). These costs should not include the costs of specific research equipment or aircraft modifications that will not be permanent.

Estimated Support Cost. Include an estimate of the costs associated with any increase in civil servant or contractor staffing, additional equipment, increased inventory, additional storage or other support facilities, and any other increase in fixed costs. It also should include an estimate of the annual operating (variable) costs.

Method of Funding. Describe how the aircraft acquisition and support will be acquired, i.e., via purchase or lease through normal procurement or via surplus, bail, or loan from another agency. Also include the program fund source.

Logistic Support. Describe how the aircraft will be supported logistically; e.g., organic support within the Center (including existing support contracts); through a new contract; or through a memorandum of agreement (MOA) with another Center, DoD, or another Federal agency. Describe any continuing logistic support requirements for disposal requests.

Environmental Impact. Describe projected environmental impact(s) of the aircraft acquisition/transfer/ disposal.

Center Point of Contact (POC): Name, phone number, and e-mail address of the POC at the Center.

Appendix I. UAS Classification Matrix

Category	I	II	III
Weight (lb)	≤ 55	55-330	> 330
Airspeed (kt)	≤ 70	≤ 200	> 200
Type	Model or sUAS	sUAS	UAS
Airworthiness & Flight Safety Review	Ops in NAS: Must comply with NASA and FAA requirements.		
	Ops in special use airspace (SUA): Commercial off-the-shelf models and sUAS receive flight approval via NASA Center airworthiness and flight safety review process. All NASA and NASA hosted aircraft must have an airworthiness statement and flight release.		Ops in special use airspace (SUA): NASA Center airworthiness and flight safety review and a flight readiness review are required. Subsequent system modifications requires technical review and FRR/AFSRB in accordance with (IAW) Center requirements. All NASA and NASA hosted aircraft must have an airworthiness certificate and flight release.
Maintenance	Only requirements levied by the FRR/AFSRB to correct deficiencies will be required for this category of aircraft.	sUAS aircraft in this category typically operate on a fly to failure maintenance schedule. Flight-critical parts will be inspected at least once per day, prior to flight activities--normally accomplished during the first preflight of the day. An appropriate maintenance inspection schedule will be developed for critical components. Individual aircraft log books will be maintained for each aircraft.	Aircraft maintenance will be accomplished, IAW NPR 7900 and applicable NASA guidance.
	Ops in NAS: Must comply with NASA and FAA requirements.		

Range Operations	All operations are visual line of sight (LOS) and will be conducted under approved local range safety authority or FAA model aircraft rules.	LOS flight operations at any authorized operations area or as identified and approved by local range safety authority. Beyond LOS flight operations IAW Center approved requirements. BLOS daisy chain flight operations are authorized if observer qualifications meet NASA requirements.	LOS and BLOS flight operations will be accomplished IAW Center- approved requirements. Range safety review and approval required.
Mishap Reporting	Ops in NAS: Must comply with NASA and FAA requirements		
	Only requirements levied by the FRR/AFSRB will be required for this category of aircraft, except for cases in which the aircraft caused injury to people or property reaching NPR 8621.1 cost thresholds.	System safety analysis will be an integral part of system operation. A hazard analysis and accepted risk list will be developed. The Center flight safety office will review and approve the analyses. Mishap reporting, IAW NPR 8621.1.	Accomplished IAW NPR 7900, NPR 8621.1 and applicable NASA and Center-developed reporting procedures.
Flight Termination System	Not required with reliable commercial RC controller.	Required unless the command and control system has proven reliability using actual flight data or a proven, regularly exercised lost link capability. Commercial RC controllers do not require an FTS.	
Waiver Authority	IAW NPR 7900 and applicable NASA HQ-approved Center guidelines.		
Oversight Responsibilities	IAW NPR 7900		

Appendix J. UAS Pilot Matrix

Category	RC Pilot	Pilot-Operator	Remote Pilot	Observer
Crew Qualifications	Ops in NAS: Must comply with NASA and FAA requirements.			Ops in NAS: Must comply with NASA and FAA requirements.
	NASA (Civil Servant and NASA contractor) certificate of qualification identifying completion of an appropriate Center, company, or military-developed and Center-approved flight training course. Must complete a flight check (in accordance with Center-developed guidelines) demonstrating competency in similar-type aircraft (rotorcraft and fixed-wing aircraft apply to this requirement).	NASA (Civil Servant and NASA contractor) Pilot-Operator requires a certificate of qualification identifying completion of a Center-developed/HQ approved, company or military flight training course.	NASA (Civil Servant and NASA contractor) Remote Pilots must meet the minimum qualifications for a NASA pilot based on NPR 7900 and IAW Center-established processes and procedures.	NASA (Civil Servant and NASA contractor) observers require a certificate of qualification identifying completion of an appropriate Center, company, or military-developed and Center-approved flight training course and must have an FAA observer requirements. Hosted observers must satisfactorily identify qualifications in a questionnaire for the Center hosting. Partnerships present a subset of hosted mode.
Medical Qualifications	Ops in NAS: Must comply with NASA and FAA requirements.			Ops in NAS: Must comply with NASA and FAA requirements.
	RC pilots require a current FAA Third Class Pilot Medical Certificate or a NASA Third Class Medical	Pilot-Operators require a current FAA Third Class Pilot Medical Certificate or a NASA Third Class Medical Exam.	Remote Pilots require a current FAA First Class Pilot Medical Certificate, a NASA First Class Medical Exam, or a military flight	Observers require a current FAA Second Class Pilot Medical Certificate or a NASA Second Class Medical

	Exam.		physical exam.	Exam.
Training	Ops in NAS: Must comply with NASA and FAA requirements.			Ops in NAS: Must comply with NASA and FAA requirements.
	Initial pilot training must include either completion of FAA private pilot written exam or completion of a Center-developed and Chief of Flight Ops-approved based on NPR 7900. Continuing training plan is Center-developed and Chief of Flight Ops approved. Training will be documented and maintained IAW NPR 7900.	Initial pilot training must meet minimum NASA Pilot-Operator training requirements. Continuing training plan is Center developed and Chief of Flight Ops approved based on NPR 7900. Training will be documented and maintained IAW NPR 7900.	Initial pilot training must meet minimum NASA Remote Pilot training requirements. Continuing training plan is Center developed and Chief of Flight Ops approved based on NPR 7900. Training will be documented and maintained IAW NPR 7900.	Initial observer training must include either completion of FAA private pilot written exam or completion of a Center-developed and Chief of Flight Ops-approved IAW NPR 7900. Continuing training plan is Center-developed and Chief of Flight Ops approved. Training will be documented and maintained IAW NPR 7900.
Currency	Ops in NAS: Must comply with NASA and FAA requirements.			Ops in NAS: Must comply with NASA and FAA requirements.
	NASA RC Pilots are not required to maintain currency in a manned aircraft, but must meet Center approved currency requirements for the type/category UAS being flown. At a minimum, 3 Center-approved qualifying currency events must be accomplished in the preceding 90 days. Each Center	Pilot-Operators will meet minimum currency requirements based on NPR 7900 and IAW Center procedures. Each Center will document and maintain currency requirements IAW NPR 7900.	NASA Remote Pilots must meet the minimum currency requirements for a NASA pilot based on NPR 7900 and IAW Center procedures. Each Center will document and maintain currency requirements IAW NPR 7900.	TBD

	will document and maintain currency requirements IAW NPR 7900.		
Waiver Authority	IAW NPR 7900 and applicable NASA HQ-approved Center guidelines.		IAW NPR 7900 and applicable NASA HQ-approved Center guidelines.
Oversight Responsibilities	IAW NPR 7900		IAW NPR 7900

Appendix K. Compliance Matrix

Req #	NPR	Requirement Statement	Responsible Party	Method to Ensure Compliance
01	1.1.4	NASA controlled aircraft are subject to Federal Aviation Regulations with respect to the use of airspace, the control of air traffic, and aircraft registration. Aircraft on loan from the U.S. Armed Forces are not subject to civil registration. NASA aircraft pilots shall secure diplomatic clearance approval prior to entry into the airspace of a foreign country except for brief use of foreign airspace adjoining the United States, as directed by air traffic control (ATC).	NASA aircraft pilots	IAOP Review
02	1.1.5	NASA aircraft shall be operated in accordance with applicable provisions of the FAA Federal Aviation Regulations (14 CFR) except: <ul style="list-style-type: none"> a. Where this directive prescribes more stringent requirements. b. Where deviations from the FAA regulations have been approved by the FAA, a Center airworthiness/flight readiness review board, or NASA policy. 	Center Directors	IAOP Review
03	1.1.6	For each Center operating aircraft/UASs or procuring aircraft/UAS services, the Center Director shall maintain a program-independent Flight Operations Office, the specific purpose of which will be to plan, organize, direct, and control the operations, maintenance, modification, safety, and support of all Center-assigned or -contracted aircraft.	Center Directors	IAOP Review

04	1.1.6.1	The head of this office is responsible for all Center-assigned or -contracted aircraft. The head of this office shall be the senior line manager who is responsible for aviation activities at the Center.	Center Directors	IAOP Review
05	1.1.6.2	The Center Director shall assign the head of the Flight Operations Office the authority and responsibility, and provide the resources necessary to manage and conduct safe, effective, and efficient operations in accordance with NASA directives, guidance, and other applicable Federal regulations.	Center Directors	IAOP Review
06	1.1.6.3	Prior to contract award, the head of the Flight Operations Office shall review and concur upon any Center contract or agreement that includes aviation operations.	Center's Chief of Flight Operations	IAOP Review
07	1.1.6.4	If a Center does not have a Flight Operations Department, the Center Director shall have another Center's Flight Operations Department review and concur on such contracts or agreements for them each time the Center procures aviation services.	Center Director	IAOP Review
08	1.2.1	The Assistant Administrator for the Office of Strategic Infrastructure shall designate aircraft classifications and assign aircraft to the appropriate Center after consultation with the affected Mission Directorates and Center Directors.	Assistant Administrator for the Office of Strategic Infrastructure	Flight Operations Performance Measurements and Reporting
09	1.2.1.1	Records created throughout flight operations management shall be maintained, managed, and disposed of by each Center's Flight Operations Office or designated office in accordance with NPR 1441.1, NASA Records Retention Schedules.	Center's Chief of Flight Operations	IAOP Review

10	1.2.2.1	Mission Directorate Associate Administrators shall coordinate early with the Office of Strategic Infrastructure to establish program or project plans involving the requirement for acquisition or use of aircraft, including UASs.	Mission Directorate Associate Administrators	Flight Operations Performance Measurements and Reporting
11	1.2.2.2	Mission Directorate Associate Administrators shall comply with OMB Circulars A-76 and A-126 as they apply to the acquisition of aircraft/UASs and coordinate related documentation requirements with the Assistant Administrator for the Office of Strategic Infrastructure.	Mission Directorate Associate Administrators	Flight Operations Performance Measurements and Reporting
12	1.2.2.3	Mission Directorate Associate Administrators shall annually review aircraft mission and program requirements, use, and associated costs, and project those requirements and costs over 5 years in an annual report to the HQ AD not later than September 30 of each year.	Mission Directorate Associate Administrators	Flight Operations Performance Measurements and Reporting
13	1.2.2.4	Mission Directorate Associate Administrators shall submit OMB Circular A-11, Exhibit 300, for aircraft and aircraft programs funded by their Directorate. These submissions shall be coordinated with the Office of Strategic Infrastructure and the Office of the Chief Financial Officer.	Mission Directorate Associate Administrators	Flight Operations Performance Measurements and Reporting
14	1.2.3.a	Center Directors shall be responsible for the airworthiness and flight safety of assigned aircraft, including UASs.	Center Directors	IAOP Review
15	1.2.3.b	Center Directors shall be responsible for coordination with the Office of Strategic Infrastructure in establishing program or project plans involving the requirement, assignment, and operation of aircraft/UASs.	Center Directors	IAOP Review

16	1.2.3.c	Center Directors shall be responsible for annually reviewing aircraft mission and program requirements (for those programs controlled/funded by their respective Center), use, and associated costs, and projecting those requirements and costs over 5 years in an annual report to the HQ AD, not later than September 30 of each year.	Center Directors	IAOP Review
17	1.2.3.d	Center Directors shall be responsible for ensuring compliance with the Financial Management Requirements in the appropriate use and application of function codes that are used to account for, track, and report aircraft costs.	Center Directors	IAOP Review
18	1.2.3.e	Center Directors shall be responsible for quarterly reporting of aircraft operations and costs to Headquarters, as stipulated in Chapter 11, and specific passenger transportation reporting requirements detailed in chapter 4 of this NPR.	Center Directors	IAOP Review
19	1.2.3.f	Center Directors shall be responsible for ensuring compliance with 41 C.F.R. §102-33, 41 C.F.R. § 300/301, and OMB Circular A-126, Improving the Management and Use of Government Aircraft.	Center Directors	IAOP Review
20	1.2.3.g	Center Directors shall be responsible for the budget for personnel and travel in support of the IAOP.	Center Directors	IAOP Review
21	1.2.3.h	Center Directors shall be responsible for approving aircraft charters or leases for periods of 30 days or less with 7 days prior notice to the HQ AD in the Office of Strategic Infrastructure.	Center Directors	IAOP Review
22	1.2.3.i	Center Directors shall be responsible for the technical assessment, cost evaluation, acquisition, use, and disposition of all aircraft/UASs under their control. This includes acquisition of aircraft/UASs used solely as wind tunnels or other nonflyable test models.	Center Directors	IAOP Review

23	1.2.3.j	Center Directors shall be responsible for coordinating and submitting all aircraft acquisition and disposition proposals to the Assistant Administrator for the Office of Strategic Infrastructure for approval.	Center Directors	IAOP Review
24	1.2.3.k	Center Directors shall be responsible for reporting all acquisition and disposal actions to the HQ AD to comply with Federal aircraft data-reporting requirements.	Center Directors	IAOP Review
25	1.2.3.l	Center Directors shall be responsible for ensuring that Center managers who acquire aircraft/UAS or aviation services coordinate those acquisitions with the Center's Flight Operations Department to ensure compliance with the NASA's Aviation Safety Program and aircraft management policies.	Center Directors	IAOP Review
26	1.2.4.a	Program/project managers shall coordinate early with the Office of Strategic Infrastructure to establish program or project plans involving the requirement for acquisition or use of aircraft, including UASs.	Program/project managers	Flight Operations Performance Measurements and Reporting
27	1.2.4.b	Program/project managers shall prepare a Business Case Analysis (BCA) in accordance with OMB Circulars A-11, A-76, and A-126 prior to the acquisition of aircraft/UASs and gain approval of the BCA by the cognizant Mission Directorate's Associate Administrator and the Assistant Administrator for the Office of Strategic Infrastructure.	Program/project managers	Flight Operations Performance Measurements and Reporting
28	1.2.4.c	Program/project managers shall annually review aircraft mission and program requirements, use, and associated costs and project those requirements and costs over 5 years to support the Mission Directorate's annual report to the HQ AD, not later than September 30 of each year.	Program/project managers	Flight Operations Performance Measurements and Reporting

29	1.2.4.d	Program/project managers shall submit OMB Circular A-11, Exhibit 300, as appropriate, for aircraft and aircraft programs funded by their Directorates. These submissions shall be coordinated with the appropriate Mission Directorate, the Office of Strategic Infrastructure, and the Office of the Chief Financial Officer.	Program/project managers	Flight Operations Performance Measurements and Reporting
30	1.2.5.1a	The Center's Chief of Flight Operations shall have a minimum of 10 years of relevant aviation-related experience, supervisory, or managerial experience in aircraft operations similar to the primary aircraft type operated at the Center, and a high level of familiarity with the organization's aircraft operations.	Center's Chief of Flight Operations	IAOP Review
31	1.2.5.1b	The Center's Chief of Flight Operations shall have current or previously held qualifications as a NASA PIC, a military rating as an Aircraft Commander, or a Federal Aviation Administration Airline Transport Pilot certificate.	Center's Chief of Flight Operations	IAOP Review
32	1.2.5.3a	The Center's Chief of Flight Operations shall ensure the effective management of flight operations under that Center's cognizance, per NPD 7900.4, NASA Aircraft Operations Management.	Center's Chief of Flight Operations	IAOP Review
33	1.2.5.3b	The Center's Chief of Flight Operations shall authorize personnel to operate and maintain aircraft under NASA control.	Center's Chief of Flight Operations	IAOP Review
34	1.2.5.3c	The Center's Chief of Flight Operations shall determine the number of aircraft types in which an individual crewmember may maintain qualification at any given time and annually review that determination.	Center's Chief of Flight Operations	IAOP Review
35	1.2.5.3d	The Center's Chief of Flight Operations shall recommend assignment of the Center Aviation Safety Officer, with the concurrence of the Center Chief of Safety and Mission Assurance, to the Center Director for approval.	Center's Chief of Flight Operations	IAOP Review

36	1.2.5.3e	The Center's Chief of Flight Operations shall fly as a crewmember or observer on all assigned aircraft, where practicable and as necessary, to observe performance of assigned flightcrews.	Center's Chief of Flight Operations	IAOP Review
37	1.2.6.1	The ASO shall manage the Center's aviation safety program as described in Chapter 6 of this NPR.	Aviation Safety Officer	IAOP Review
38	1.2.6.2	The ASO shall be a civil servant assigned to the Flight Operations Department, serve as the Center's focal point for aviation safety, and act on behalf of the Center Director when discharging this responsibility.	Aviation Safety Officer	IAOP Review
39	1.2.7.1a	To qualify for assignment, the Chief Pilot shall hold and maintain qualification as a NASA PIC.	Chief Pilot	IAOP Review
40	1.2.7.1b	To qualify for assignment, the Chief Pilot shall have at least 3 years experience within the past 6 years as PIC of an aircraft similar in category and class to at least one of the aircraft used in the types of operations being conducted at the Center.	Chief Pilot	IAOP Review
41	1.2.7.1c	To qualify for assignment, the Chief Pilot shall demonstrate satisfactory supervisory and managerial capabilities.	Chief Pilot	IAOP Review
42	1.2.8	Chief of Maintenance shall be assigned to the Flight Operations Department and serve as the Chief of Flight Operations' focal point for all aircraft maintenance activities.	Center Director	IAOP Review
43	1.2.8.1a	To qualify for assignment, the Chief of Maintenance shall have had at least 3 years of experience within the past 6 years in aircraft maintenance in a similar-size operation maintaining aircraft similar to those used by the Center, with management experience such as supervisor or lead in aircraft maintenance.	Chief of Maintenance	IAOP Review

44	1.2.8.1b	To qualify for assignment, the Chief of Maintenance shall have held an FAA Airframe and Power Plant Certification, have held an equivalent military designation, or demonstrate an equivalent level of qualifications and expertise.	Chief of Maintenance	IAOP Review
45	1.2.9.1a	To qualify for assignment, the Chief of Quality Assurance shall hold a current FAA Inspection Authorization Certificate or have held an equivalent military designation, or demonstrate an equivalent level of qualifications and expertise.	Chief of Quality Assurance	IAOP Review
46	1.2.9.1b	To qualify for assignment, the Chief of Quality Assurance shall maintain a level of inspection expertise and activity needed to meet FAA Inspection Authorization Certificate renewal requirements or the military equivalent.	Chief of Quality Assurance	IAOP Review
47	1.2.9.1c	To qualify for assignment, the Chief of Quality Assurance shall have had at least 3 years of maintenance experience within the last 6 years, 1 year of which will have been as a maintenance inspector.	Chief of Quality Assurance	IAOP Review
48	1.2.9.1d	To qualify for assignment, the Chief of Quality Assurance shall have at least 1 year of experience in a supervisory capacity.	Chief of Quality Assurance	IAOP Review
49	1.2.10.a	The IAOP shall advise the Assistant Administrator for the Office of Strategic Infrastructure regarding operational, management, and safety policies for NASA aircraft.	IAOP	Flight Operations Performance Measurements and Reporting
50	1.2.10.b	The IAOP shall conduct periodic meetings with the HQ AD to review policies and procedures related to aircraft/UAS operational matters affecting all Centers and to make recommendations to the AD regarding policies, procedures, and guidelines that may be applicable to all Centers.	IAOP	Flight Operations Performance Measurements and Reporting

51	1.2.10.c	The IAOP shall conduct reviews of a special nature at the request of the Assistant Administrator for the Office of Strategic Infrastructure and periodic reviews of all aspects of flight operations at NASA Centers, including compliance with applicable Federal regulations and Headquarters and Center policies and procedures.	IAOP	Flight Operations Performance Measurements and Reporting
52	1.2.11.a	The HQ AD shall coordinate the formulation of Agency-wide policies, procedures, and guidelines concerning aircraft/UAS operation and ensure their effective and efficient communication to Centers and appropriate Headquarters Offices.	HQ AD	Flight Operations Performance Measurements and Reporting
53	1.2.11.b	The HQ AD shall advise and assist the Assistant Administrator for the Office of Strategic Infrastructure, Mission Directorates, and Center Directors concerning the acquisition/disposition process.	HQ AD	Flight Operations Performance Measurements and Reporting
54	1.2.11.c	The HQ AD shall advise the Assistant Administrator for the Office of Strategic Infrastructure regarding the establishment of policy for the use of NASA aircraft/UASs.	HQ AD	Flight Operations Performance Measurements and Reporting
55	1.2.11.d	The HQ AD shall coordinate the findings and recommendations of IAOP reviews, dealing with institutional management issues, with the appropriate institutional Associate Administrator.	HQ AD	Flight Operations Performance Measurements and Reporting
56	1.2.11.e	The HQ AD shall maintain liaison with other Government agencies and the private sector on matters pertaining to flight operations, maintenance, and management practices common to all Centers.	HQ AD	Flight Operations Performance Measurements and Reporting
57	1.2.11.f	The HQ AD shall provide coordination and other assistance in the assignment of IAOP teams as they review and evaluate the adequacy of Center organizations, facilities, and procedures for flight	HQ AD	Flight Operations Performance Measurements and Reporting

		operations.		
58	1.2.11.g	The HQ AD shall provide inter-Center and interagency coordination for logistics support to Centers, as necessary.	HQ AD	Flight Operations Performance Measurements and Reporting
59	1.2.11.h	The HQ AD shall collect, collate, and report Agency aircraft data (e.g., FAIRS data) to other Federal agencies.	HQ AD	Flight Operations Performance Measurements and Reporting
60	1.2.12	The Chief, Safety and Mission Assurance shall provide leadership, policy direction, functional oversight, assessment, standards, and coordination for safety and mission assurance affecting NASA aviation operations.	Chief, Safety and Mission Assurance	Flight Operations Performance Measurements and Reporting
61	1.4.1	All flight crews conducting international, RVSM, MNPS, RNAV or RNP shall complete (as appropriate to the operation) airspace operations training and be authorized to operate in such airspace in accordance with FAA regulations (14 C.F.R.).	Flight Crews	IAOP Review
62	1.4.2	While conducting operations in foreign countries or international airspace, all NASA flights will be conducted as State aircraft under a diplomatic clearance. Center Flight Operations shall utilize DoD 4500.54-M (DoD Foreign Clearance Guide) and DoD Flight Information Publications for proper international operations coordination.	Center's Chief of Flight Operations	IAOP Review
63	1.4.3	The Center Director shall be responsible for identifying and complying with all national and local environmental laws and requirements for the proper handling and disposal of international garbage on NASA aircraft.	Center Directors	IAOP Review
64	1.5.1	Each NASA aircraft shall be operated in accordance with an aircraft manual providing standard operating procedures.	Center's Chief of Flight Operations	IAOP Review

65	1.5.1	Aircraft manuals (or checklist) shall be accessed electronically or carried onboard all NASA aircraft.	Center's Chief of Flight Operations	IAOP Review
66	1.5.1	For UASs, aircraft manuals shall be immediately accessible to the pilots.	Center's Chief of Flight Operations	IAOP Review
67	1.5.2	All NASA Flight Operations flight planning libraries shall have available the necessary flight information publications for U.S. and international operations.	Center's Chief of Flight Operations	IAOP Review
68	1.5.3	Each Center shall have a program for their aircrews to maintain a level of proficiency that will ensure their ability to safely operate an aircraft within governing regulations to include abnormal and emergency situations.	Center's Chief of Flight Operations	IAOP Review
69	1.5.4	Each Center shall establish and maintain a training program using check flights to assess its adequacy and ensure that a person is competent to perform their assigned duties.	Center's Chief of Flight Operations	
70	1.6.1	When deviations from this NPR are necessary, Center Directors or Associate Administrators shall submit requests for waivers to the Assistant Administrator for the Office of Strategic Infrastructure via HQ AD.	Center Directors or Associate Administrators	IAOP Review
71	1.6.1.1	Prior written approval from the Assistant Administrator for the Office of Strategic Infrastructure shall be obtained before implementing procedures that are less restrictive than those contained in this NPR.	Center Directors or Associate Administrators	IAOP Review
72	1.6.4	The waiver approval authority shall approve waivers only for a specific event, period, or duration and specify the boundaries of the requirement being waived.	Waiver Approval Authority	IAOP Review

73	1.6.5	The waiver approval authority shall notify all who have current waivers against this NPR when this NPR is updated and request verification of continued validity.	Waiver Approval Authority	IAOP Review
74	1.6.6	NASA officials who request waivers shall document the following in the request for waiver: a.) Identification of the directive and specific requirement(s) for which the waiver is requested; b.) scope (e.g., site, facility, operation, or activity) and duration of the waiver request; c.) justification for the waiver, including: (1) purpose/rationale for requesting the waiver; (2) whether application of the requirement in the particular circumstances would conflict with another requirement; (3) whether application of the requirement in the particular circumstances would not achieve, or is not necessary to achieve, the underlying purpose of the requirement; (4) any other pertinent data or information related to the waiver request (e.g., cost or schedule considerations); (5) identification and justification of the acceptance of any additional risk that will be incurred if the waiver is granted; (6) a description of any special circumstances that warrant granting the waiver, including whether: (a) Application of the requirement in the particular circumstances would not be justified by any safety and health reason; (b) the waiver would result in a health and safety improvement that compensates for any detriment that would result from granting the waiver; or (c) there exists any other material circumstances that were not considered when the requirement was adopted, for which it is in the public interest to grant a waiver; (7) a description of any alternative or mitigating action that will be taken to ensure adequate safety and health and protection of the public, the workers, and the environment for the	NASA officials who request waivers	IAOP Review

		period the waiver will be effective.		
75	2.2.1	NASA aircraft shall be operated in an airworthy condition as certified by a formal NASA airworthiness review board, under the authority of a NASA Center Director, using a NASA Certificate of Airworthiness process.	Center Directors	IAOP Review
76	2.2.1.1	All NASA aircraft shall possess and maintain a NASA Certificate of Airworthiness (Appendix F) approved by the Center Director.	Center Directors	IAOP Review
77	2.2.1.1	For all NASA aircraft other than NASA-owned aircraft, the certificate shall state the duration of applicability, as well as any limitations of that certificate.	Center Directors	IAOP Review
78	2.2.1.2	All aircraft used for passenger transportation purposes shall possess a "Normal" or "Transport" category FAA Certificate of Airworthiness.	Center Directors	IAOP Review
79	2.2.1.3	When NASA aircraft are transferred between Centers, a new NASA Certificate of Airworthiness, approved by the receiving Center Director, shall be obtained prior to commencing flight.	Center Directors	IAOP Review
80	2.2.2	Airworthiness, flight safety, and mission readiness reviews, including configuration control, shall be conducted for all aircraft modifications, with the exception of those noted in paragraph 2.4.2.4 that are cleared through an airworthiness review process or configuration control process.	Center Directors	IAOP Review
81	2.2.3	Each Center shall clearly identify the appropriate airworthiness review process for experimental, research, and operational configurations and nonstandard ground or flight operations for all aircraft operated by the Center.	Center Directors	IAOP Review

82	2.3.2	Center Directors shall establish airworthiness, flight safety, mission readiness, and configuration control review processes and procedures to identify any hazards, to manage the risks associated with flight programs, to ensure safe flight operations, to manage and thoroughly document aircraft configurations, and to ensure that flight objectives satisfy programmatic requirements.	Center Directors	IAOP Review
83	2.3.2	Center Directors shall ensure that these review processes and procedures are incorporated into the contracts of those who operate and maintain NASA aircraft.	Center Directors	IAOP Review
84	2.4.1	Center Directors shall establish procedures to ensure that airworthiness and safety reviews are conducted for flight operations or missions.	Center Directors	IAOP Review
85	2.4.1.1	Reviews shall ensure that hazards associated with aircraft experimental modifications, research, or unique internal or external payloads and nonstandard operations are identified and that risks are adequately managed to enhance the likelihood of mission and program success for all aircraft missions or operations and to minimize the risks to persons or property.	Center Directors	IAOP Review
86	2.4.1.2	Program managers shall review flight programs early in the development cycle to identify the need and schedule for additional safety-related resources, procedures, or reviews.	Program managers	IAOP Review
87	2.4.1.3	Managers shall ensure that aircraft modifications are accomplished with sufficient time for engineers and technicians to safely complete required tasks.	Program managers	IAOP Review

88	2.4.1.4	Center Directors shall establish configuration control procedures to ensure that the configuration of each NASA aircraft is fully documented and reviewed.	Center Directors	IAOP Review
89	2.4.1.5	Center Directors shall establish a minimum equipment list for all non-test-related equipment for all aircraft operations.	Center Directors	IAOP Review
90	2.4.1.6	Test-related equipment will be handled through the flight test planning process. If test equipment remains on the aircraft for non-test-related missions, then such equipment shall be addressed in the aircraft MEL.	Center Directors	IAOP Review
91	2.5.1	Each Center Director shall ensure that the ARP is staffed with personnel possessing the appropriate scientific, engineering, operational, maintenance, and managerial expertise, including at least one NASA pilot and the ASO.	Center Directors	IAOP Review
92	2.5.2	Any cockpit or cabin modifications that might interfere with aircrew egress shall be reviewed by a subpanel, including aircrew and life support personnel.	Center Directors	IAOP Review
93	2.5.4	The ARP shall be continual throughout the course of a project.	Center Directors	IAOP Review
94	2.5.5	Each Center shall establish the content of the ARP based on the aircraft mission, complexity of the modifications, and the inherent hazards associated with the operation.	Center Directors	IAOP Review
95	2.5.5.1	Content for ARP approvals shall be documented in Center-level ARP procedures.	Center Directors	IAOP Review
96	2.5.5.1b	The results of tests conducted to verify the engineering analyses also shall be considered in ARP approvals.	Center Directors	IAOP Review

97	2.5.5.1c	Actions to be taken in the event of in-flight malfunctions or emergency conditions associated with the aircraft modifications or nonstandard operations also shall be described in ARP approvals.	Center Directors	IAOP Review
98	2.5.6	The final ARP approval shall contain a description of the configuration of the aircraft, operating instructions and procedures, operating limitations and restrictions, and specific maneuvers or operations for which the aircraft is cleared.	Center Directors	IAOP Review
99	2.6.1	All maintenance and inspections shall be performed in accordance with Chapter 2 and the applicable manufacturers' manuals, as appropriate.	Center's Chief of Flight Operations	IAOP Review
100	2.6.2	NASA aircraft shall be maintained in accordance with an established and documented Center maintenance program, using standards of quality in workmanship, materials, and support equipment that will ensure airworthiness of aircraft for safety of flight.	Center's Chief of Flight Operations	IAOP Review
101	2.6.2	All NASA aircraft shall be maintained in a condition for safe operation and meet their respective type designs or properly altered condition.	Center's Chief of Flight Operations	IAOP Review
102	2.6.2	A maintenance program shall meet FAA regulations for any passenger seating capacity for an aircraft that is used for passenger transportation.	Center's Chief of Flight Operations	IAOP Review
103	2.6.3.1	Center Flight Operations shall maintain continuous onsite oversight of vendors and facilities performing aircraft depot-level overhauls or major aircraft modifications to ensure quality of workmanship, adherence to NASA standards, schedule, and cost control.	Center's Chief of Flight Operations	IAOP Review

104	2.6.3.2	Individuals assigned onsite responsibilities shall have expertise and experience in aircraft airworthiness standards and requirements.	Center's Chief of Flight Operations	IAOP Review
105	2.6.3.3a	For maintenance performed outside of NASA, the Chief of Maintenance shall ensure that the person(s) performing the maintenance, preventive maintenance, or alteration is properly certificated and qualified to perform the assigned function.	Center's Chief of Maintenance	IAOP Review
106	2.6.3.3b	For maintenance performed outside of NASA, the Chief of Maintenance shall ensure that the work performed is done in accordance with the NASA- approved continuous airworthiness program and/or FARs.	Center's Chief of Maintenance	IAOP Review
107	2.6.3.3c	For maintenance performed outside of NASA, the Chief of Maintenance shall ensure that a record is made in the aircraft log book of the description of work performed, the date, certificate number, and type of certificate held by the person performing the work.	Center's Chief of Maintenance	IAOP Review
108	2.6.5	Each Center shall develop written maintenance procedures and practices in a Center maintenance manual that supports the aircraft-specific (manufacturer, NASA, or DoD) maintenance programs.	Center's Chief of Maintenance	IAOP Review
109	2.6.5	While this maintenance program may be completed by contractor maintenance, the contractor is required to follow the Center maintenance manual whose accuracy and currency shall be the responsibility of the Chief of Maintenance.	Center's Chief of Maintenance	IAOP Review
110	2.6.5.1a	The maintenance plan detailed in the Center maintenance manual shall include a description of how aircraft log books and associated records for assigned aircraft and components are maintained.	Center's Chief of Maintenance	IAOP Review

111	2.6.5.1a (1)	Persons signing entries in the aircraft logbook, and/or entries on Serviceable Parts Tags shall be authorized in accordance with the NASA requirements and applicable FARs and have satisfactorily completed maintenance training or possess the equivalent current experience on the applicable-type appliance, aircraft, engine, or propeller.	Center's Chief of Maintenance	IAOP Review
112	2.6.5.1a (2)	Persons signing entries in the aircraft logbook, and/or entries on Serviceable Parts Tags, shall understand and have knowledge of FARs, and the applicable types of maintenance or overhaul manuals, and follow the applicable procedures set forth therein.	Center's Chief of Maintenance	IAOP Review
113	2.6.5.1a (3)	Persons signing entries in the aircraft logbook, and/or entries on Serviceable Parts Tags, shall meet Center-defined certification processes.	Center's Chief of Maintenance	IAOP Review
114	2.6.5.1b	The maintenance plan detailed in the Center maintenance manual shall include a documented aircraft release procedure that ensures all maintenance release authorities are designated in writing.	Center's Chief of Maintenance	IAOP Review
115	2.6.5.1b	The maintenance plan detailed in the Center maintenance manual shall include a documented aircraft release process for aircraft that are deployed away from the Center.	Center's Chief of Maintenance	IAOP Review
116	2.6.5.1b (1)	Any individual with maintenance release authority shall have at least 6 months experience in the preceding 24 months in inspecting, servicing, or maintaining an aircraft or system, in accordance with Center maintenance procedures.	Center's Chief of Maintenance	IAOP Review
117	2.6.5.1c	The maintenance plan detailed in the Center maintenance manual shall include written ground-handling procedures that may be accomplished only by qualified ground handling personnel to perform fire guard,	Center's Chief of Maintenance	IAOP Review

		application of external electrical power, towing, engine run, and taxi operations that documents aircraft-specific training and designates those qualified in writing.		
118	2.6.5.1d	The maintenance plan detailed in the Center maintenance manual shall include a documented METCAL Program that establishes policy, responsibilities, and requirements to ensure that calibrated and tested tools/special equipment performance is compared to reference CALSTDs of known and sufficiently greater accuracy.	Center's Chief of Maintenance	IAOP Review
119	2.6.5.1e	The maintenance plan detailed in the Center maintenance manual shall include a documented foreign object damage (FOD) control program that addresses periodicity and inspection criteria and effectively reduces the risk of FOD both during maintenance and during flight operations.	Center's Chief of Maintenance	IAOP Review
120	2.6.5.1e	All flight operations personnel shall be constantly on lookout for material that could be ingested into engines, struck by propeller blades, and/or blown by the exhaust of engines or propellers, causing injury to personnel or damage to aircraft.	Center's Chief of Maintenance	IAOP Review
121	2.6.5.1e	Maintenance personnel shall be assigned to perform a general inspection of hangar and ramp areas on a weekly basis at a minimum.	Center's Chief of Maintenance	IAOP Review
122	2.6.5.1f	The maintenance plan detailed in the Center maintenance manual shall include a documented tool control program (TCP) that ensures tool inventories are accurate at specific intervals, contains a lost tool process, and prohibits aircraft from flying until all tools used on an aircraft have been accounted for.	Center's Chief of Maintenance	IAOP Review

123	2.6.5.1f	The TCP shall apply to all commercial and other Government activities performing contract maintenance, production, or other support functions on NASA aircraft.	Center's Chief of Maintenance	IAOP Review
124	2.6.5.1f	The TCP shall provide instant inventory capability.	Center's Chief of Maintenance	IAOP Review
125	2.6.5.1g	The maintenance plan detailed in the Center maintenance manual shall include a documented process to ensure all GSE used on aircraft are safe and operable.	Center's Chief of Maintenance	IAOP Review
126	2.6.5.1g	GSE shall be maintained per written requirements that document how to identify and remove equipment that is unserviceable.	Center's Chief of Maintenance	IAOP Review
127	2.6.5.1g	GSE shall be maintained and documented under an aviation maintenance system or other NASA-approved system.	Center's Chief of Maintenance	IAOP Review
128	2.6.5.1h	The maintenance plan detailed in the Center maintenance manual shall include maintenance procedures and technical standards for Aviation Survival Equipment (including life support and ejection seats) for the equipment being flown, which are an integrated function of aircraft maintenance.	Center's Chief of Maintenance	IAOP Review
129	2.6.5.1h	If the Center maintains explosive devices (propellant actuated devices (PADs)/cartidge actuated devices (CADs)), the Center maintenance manual shall document the program for personnel training and qualifications.	Center's Chief of Maintenance	IAOP Review
130	2.6.5.1.h	All tools shall be accounted for after the repack and inspection of each item, for example, parachutes and floatation equipment, since these items cannot be functionally checked prior to use.	Center's Chief of Maintenance	IAOP Review

131	2.6.5.1i	The maintenance plan detailed in the Center maintenance manual shall include a documented Confined Space Program that defines all aircraft confined spaces and ensures safety in these spaces prior to entry per NPR 8715.3, NASA General Safety Program Requirements.	Center's Chief of Maintenance	IAOP Review
132	2.6.5.1j	The maintenance plan detailed in the Center maintenance manual shall include a documented program that ensures aircraft maintenance complies with Center Electromagnetic Interference (EMI)/Electrostatic Discharge (ESD) programs.	Center's Chief of Maintenance	IAOP Review
133	2.6.5.1k	The maintenance plan detailed in the Center maintenance manual shall include a Fuel Surveillance Program that ensures fuel is free of contaminants prior to fuel entering any Center aircraft.	Center's Chief of Maintenance	IAOP Review
134	2.6.5.1.1	The maintenance plan detailed in the Center maintenance manual shall include a documented program that ensures aircraft maintenance is conducted in compliance with the Center Hazardous Material Program and the Protection of the Environment Act, 40 C.F.R. §§ 260 to 265, which shall include use, disposal, and both long-term and worksite storage of hazardous materials.	Center's Chief of Maintenance	IAOP Review
135	2.6.5.1m	The maintenance plan detailed in the Center maintenance manual shall include an oil analysis program per original equipment manufacturer (OEM) and/or DoD maintenance instructions to identify mechanical breakdown precursors that exist prior to catastrophic failure. The program shall be specific to the type of engine installed and provide trend analysis, immediate feedback, and recommended actions to the Center's Chief of Maintenance.	Center's Chief of Maintenance	IAOP Review

136	2.6.5.1n	The maintenance plan detailed in the Center maintenance manual shall include a documented Weight and Balance (W&B) Program for each aircraft in compliance with any existing Center program.	Center's Chief of Maintenance	IAOP Review
137	2.6.5.1o	The maintenance plan detailed in the Center maintenance manual shall include a configuration control process (CCP) established to determine applicability and ensure compliance with Product Improvement Publications (PIP), which are defined as airworthiness directives, technical orders, service and safety bulletins, or other pertinent requirements including those from FAA, DoD, or OEMs.	Center's Chief of Maintenance	IAOP Review
138	2.6.5.1o	The CCP shall provide a complete audit trail of decisions and design modifications.	Center's Chief of Maintenance	IAOP Review
139	2.6.5.1p	The maintenance plan detailed in the Center maintenance manual shall include an Aviation Material Management process to ensure that aircraft and aircraft parts are inventoried and property accountability records are properly documented per NPR 4100.1, NASA Materials Inventory Management Manual, and Center procedures.	Center's Chief of Maintenance	IAOP Review
140	2.6.5.1q	The maintenance plan detailed in the Center maintenance manual shall include general housekeeping to ensure aviation facilities are maintained to NASA standards for hangars, shops, and ramps.	Center Chiefs of Flight Operations	IAOP Review
141	2.6.5.1r	Explosives-laden aircraft shall be parked in designated aircraft parking areas that meet airfield criteria and afford appropriate quantity distance criteria to eliminate hazards to personnel and resources per NASA STD 8719.12, Section 5.15.13.	Center Chiefs of Flight Operations	IAOP Review

142	2.6.5.1s	The maintenance plan detailed in the Center maintenance manual shall include a documented aircraft component inspection program to determine the serviceability, authenticity, traceability, and airworthiness of parts, components, accessories, and assemblies by subjecting them to inspections, tests, or operational checks.	Center's Chief of Maintenance	IAOP Review
143	2.6.5.1s (1)	Organizations providing maintenance support to the Center shall have a procurement program to prevent purchasing unapproved parts and material in type certificated products.	Center's Chief of Maintenance	IAOP Review
144	2.6.5.1s (2)	The Center-approved parts program shall include, at a minimum, methods to establish qualified suppliers who are authorized to manufacture or distribute parts they supply and criteria to identify and screen potential unapproved parts suppliers.	Center Directors	IAOP Review
145	2.6.6.1	A documented Training Program shall be defined in the Center maintenance manual that ensures that maintenance personnel and QA inspectors are trained and qualified prior to being assigned.	Center Directors	IAOP Review
146	2.6.6.1	The Training Program shall document the Center-defined recurrent and proficiency training requirements to ensure maintenance personnel and QA inspectors attend refresher training that addresses changes to aircraft systems, test equipment, or critical troubleshooting and repair techniques at least every 24 months.	Center Directors	IAOP Review
147	2.6.6.2	All maintenance personnel that are qualified to perform servicing, inspections, and functional tests shall have completed the required training program, which shall be documented in their individual training records.	Center Directors	IAOP Review

148	2.6.6.3	The Training Program shall include all Center Safety Program training requirements, including training on fire protection equipment, medical stations, and hazardous materials.	Center Directors	IAOP Review
149	2.6.6.4	Within the training program, all required support functions shall be addressed. These include computer training, logistics training, and operator training for facilities and ground support equipment such as hoists, tow tractors, and lifts.	Center Directors	IAOP Review
150	2.6.6.5	Qualification records shall be kept up to date by the Chief of Maintenance or Center Training Officer to reflect both resident and onsite training.	Center Directors	IAOP Review
151	2.6.7.1	NAMIS shall be utilized to track servicing, inspections, and METCAL compliance.	Center Directors	IAOP Review
152	2.6.7.3	The remaining NAMIS modules are optional, but NAMIS can be used to track demands (i.e., requisitions) but shall be used to track receipts and issues regardless of how or who requisitioned the item.	Center Directors	IAOP Review
153	2.6.8.1	A comprehensive aircraft maintenance QA program is critical to flight safety. Each NASA Center that is responsible for the maintenance of NASA aircraft shall ensure that QA is integrated into every aspect of aircraft maintenance and that only fully qualified personnel are assigned as QA inspectors.	Center Directors	IAOP Review
154	2.6.8.1	The Center shall operate a program to provide for analysis and surveillance of its continuous airworthiness maintenance program including work performed according to Center requirements by a non-NASA entity.	Center Directors	IAOP Review

155	2.6.8.3	Each Center shall develop a written QA plan or quality management system (QMS) that covers all aspects of maintenance, material acceptance, documentation review, maintenance instruction applicability, and currency.	Center Directors	IAOP Review
156	2.6.8.3	QA shall ensure aircraft configuration and aircraft components have been properly maintained and that all requirements have been properly documented	Center Directors	IAOP Review
157	2.6.8.3	QA shall provide trend analysis and investigation of recurring discrepancies, high-failure-rate components, and high-usage materials to identify underlying causes for poor quality.	Center Directors	IAOP Review
158	2.6.8.5a	QA responsibilities shall be performed to establish qualification requirements for QA personnel and collateral duty personnel.	Center Directors	IAOP Review
159	2.6.8.5b	QA responsibilities shall be performed to provide a continuous training program in techniques and procedures pertaining to aircraft maintenance per paragraph 2.6.4 and the conduct of inspections.	Center Directors	IAOP Review
160	2.6.8.5c	QA responsibilities shall be performed to ensure that established standard procedures are observed for conducting scheduled and unscheduled inspections, ground tests, and bench check of components, including engines.	Center Directors	IAOP Review
161	2.6.8.5d	QA responsibilities shall be performed to ensure the configuration of aircraft and components is correct and all essential modifications have been incorporated.	Center Directors	IAOP Review
162	2.6.8.5e	QA responsibilities shall be performed to ensure an inspection is conducted on all equipment received for use, returned for repair, or held awaiting repair to verify satisfactory material condition, identification, packaging, preservation, and configuration; and when applicable,	Center Directors	IAOP Review

		that shelf-life limits are not exceeded.		
163	2.6.8.5f	QA responsibilities shall be performed to ensure ensure check pilots and aircrew are briefed before post-maintenance functional check flights (FCFs) so that the purpose and objectives of the flight are clearly understood. After completion of the FCF, debrief the check pilots, aircrew, maintenance control representative, and applicable work Center representatives to determine compliance with objectives outlined on the FCF checklist and clarify discrepancies noted.	Center Directors	IAOP Review
164	2.6.8.5g	QA responsibilities shall be performed to review all incoming technical publications and directives to determine their applicability to Center-maintained aircraft.	Center Directors	IAOP Review
165	2.6.8.5h	QA responsibilities shall be performed to conduct Parts and Hardware Certification of all items procured. All incoming serviceable aircraft material, parts, or components will be placed in a secured area and inspected by a QA inspector or designee. Ensure the part or material is in good condition and conforms to specifications and standards. Ensure certification paperwork or data is correct for applicability and acceptance requirements.	Center Directors	IAOP Review
166	2.6.8.5i	QA responsibilities shall be performed to ensure personnel are trained in Government-Industry Data Exchange Program (GIDEP) and FAA Suspected Unapproved Parts (SUP) Program and coordinate all actions with Center GIDEOP office, HQ AD, and the Inspector General (IG) as appropriate.	Center Directors	IAOP Review
167	2.6.8.5j	QA responsibilities shall be performed to monitor weight and balance of all Center aircraft in accordance with Center guidelines.	Center Directors	IAOP Review

168	2.6.8.5k	QA responsibilities shall be performed to validate all work orders (excluding minor aircraft write-ups/gripes) and oversee the installation of all work orders on aircraft.	Center Directors	IAOP Review
169	2.6.8.5l	QA responsibilities shall be performed to assist the ASO in the impounding of Center aircraft involved in a mishap or when directed by ASO.	Center Directors	IAOP Review
170	2.6.8.5m	QA responsibilities shall be performed to monitor maintenance using a program to develop trend analysis of processes. This program analyzes all reports of findings and/or actions taken during aircraft and component maintenance.	Center Directors	IAOP Review
171	2.6.8.7	Surveillance or monitoring programs use product or process surveillance based on an effective audit program and an objective statistical history. Sampling and surveillance verifications shall be used independently or in combination to accomplish the verification function of all QA processes.	Center Directors	IAOP Review
172	2.6.9.2	All manuals shall be maintained in accordance with the original manufacturers' updates or revisions (or DoD updates or revisions for DoD aircraft) as modified with NASA or FAA approved data.	Center Directors	IAOP Review
173	2.6.9.2	Centers shall maintain documentation to confirm that periodic revision status audits of the technical library have been conducted.	Center Directors	
IAOP Review				
174	2.6.9.2	Exceptions to this policy, including additional changes to documents, shall be approved by the Chief of Flight Operations.	Center Directors	IAOP Review

175	3.1.1.1	Center Chiefs of Flight Operations shall establish procedures to ensure that all flights of NASA aircraft are properly approved and documented, allowing for all contingencies such as deployed aircraft and aircraft ferry approvals.	Center's Chief of Flight Operations	IAOP Review
176	3.1.1.2	Emergency lifesaving, humanitarian operations, and Homeland Security missions, as pre-approved by the Center Director, may be carried out in any NASA aircraft he/she designates; the circumstances shall be documented and reported to the Assistant Administrator for the Office of Strategic Infrastructure within 30 days of action.	Center Directors	IAOP Review
177	3.1.2.1	All NASA aircraft operations shall establish applicable stabilized approach criteria suited to their particular flight operation.	Pilot in Command	IAOP Review
178	3.1.2.2	In the absence of flight manual or aircraft directive guidance, a stabilized approach shall be established by 1,000 feet above airport elevation in instrument meteorological conditions (IMC), by 500 feet above airport elevation in visual meteorological conditions (VMC), and by 300 feet above airport elevation for a circling approach or overhead patterns.	Pilot in Command	Check Flight
179	3.1.2.3	In the event that a stabilized approach is not established by the altitudes required in paragraph 3.1.2.2, a missed approach shall be executed.	Pilot in Command	Check Flight
180	3.1.3.1	As part of the Agency's continuous risk management process, all NASA flight operations shall manage these risks in accordance with the specific provisions of this NPR and NPR 8000.4.	Center Directors	IAOP Review
181	3.1.3.2	All NASA aircraft shall be configured with FAA approved TCAS and EGPWS systems for the specific type model aircraft.	Center Directors	IAOP Review

182	3.1.3.3	As part of the Agency's continuous risk management process, all NASA flight operations shall develop a TCAS/EGPWS Risk Management Plan for all aircraft in a Center's inventory not configured with these two systems	Center Directors	IAOP Review
183	3.1.3.6	All manned NASA aircraft contracted through commercial vendors shall be configured with FAA-approved TCAS and EGPWS systems for the specific type model aircraft.	Center Directors	IAOP Review
184	3.1.4	All flight deck crew members of large or turbojet aircraft shall communicate through a boom or throat microphones below the transition level/altitude.	Flight Deck Crew Members	Check flight
185	3.2.1	The PIC of a NASA aircraft shall be a designated NASA pilot.	Pilot in Command	IAOP Review
186	3.2.3	The PIC of a NASA aircraft shall ensure the crew is briefed on the mission plan, safety procedures, and emergency information, including emergency egress.	Pilot in Command	IAOP Review
187	3.2.4	Center Chiefs of Flight Operations shall have a process to train, designate, and document individuals authorized to pilot Functional Check Flight operations.	Center Chiefs of Flight Operations	IAOP Review
188	3.2.5	All NASA PICs shall be trained on the operating rules and procedures of the FAA FAR's and the ICAO Rules of the Air when operating in international airspace.	Center Chiefs of Flight Operations	IAOP Review
189	3.2.6	The duties and responsibilities of the PIC shall be specified in Center policy in accordance with agency standards of practice.	Center Chiefs of Flight Operations	IAOP Review
190	3.2.7	The PIC of any NASA aircraft entering a foreign country shall be responsible for the custody and care of disembarking passengers and crew members from the time they leave the aircraft until they are accepted for examination for entry into a State.	Pilot in Command	IAOP Review

191	3.3.1	All flight crew currency documentation shall be recorded in the NASA standard application, NASA Aircraft Management Information System (NAMIS).	Center Chiefs of Flight Operations	IAOP Review
192	3.3.2	NASA UAS flight time shall be kept separate from NASA manned aircraft flight time by type in NAMIS.	Center Chiefs of Flight Operations	IAOP Review
193	3.3.3	Each Center shall establish a means to document that flight critical information has been passed to all flightcrew.	Center Chiefs of Flight Operations	IAOP Review
194	3.3.4	Records pertaining to NASA flight activities shall include, at a minimum, the following: a.) Approval of mission; b.) name and duty status of all on board; c.) purpose of the flight; d.) routing or flight events and takeoff /landing times.	Center's Chief of Flight Operations	IAOP Review
195	3.4.1	NASA flightcrews shall be qualified in accordance with written standards set forth in Center-developed criteria.	Center's Chief of Flight Operations	IAOP Review
196	3.4.1.1	Records of qualification and flight evaluation are required and shall be maintained in aircrew training records.	Center's Chief of Flight Operations	IAOP Review
197	3.4.1.2	A review of pilot and crew qualifications shall be made prior to flight assignment to ensure that prerequisites for the intended mission are met.	Center's Chief of Flight Operations	IAOP Review
198	3.4.1.3	The Center's Chief of Flight Operations shall designate the crewmembers for aircraft that are under the Center's purview.	Center's Chief of Flight Operations	IAOP Review
199	3.4.3.1	Center Flight Operations shall impose sufficient proficiency requirements or flight time/sortie requirements on flightcrews to meet mission needs.	Center's Chief of Flight Operations	IAOP Review
200	3.4.3.1	Private pilot time shall not be recorded in NASA information systems or utilized to meet any proficiency requirements.	Center Chiefs of Flight Operations	IAOP Review

201	3.4.3.2	Each Center shall develop a written flightcrew training plan which, at a minimum, shall meet the following requirements: a.) annual night flying requirements; b.) landings in category (fixed-wing/rotorcraft); c.) six instrument approaches under actual or simulated conditions within 6 calendar months; d.) Completing 100 hours of flight time per fiscal year in any aircraft or flight simulator approved by the Center's Chief of Flight Operations or 80 hours of flight time and 100 sorties if all flown in the same Model, Design, and Series aircraft or flight simulator.	Center's Chief of Flight Operations	IAOP Review
202	3.4.3.3	Center directives shall establish separate aircrew qualification and currency requirements for unique aircraft (e.g., project, military, experimental) in which the aircrew cannot meet the above requirements.	Center Director	IAOP Review
203	3.4.3.4	The Center's Chief of Flight Operations shall document the method to regain qualification in the flightcrew training plan and notify the Assistant Administrator for the Office of Strategic Infrastructure via HQ AD of this action in a letter from the Center Director	Center Chiefs of Flight Operations	IAOP Review
204	3.4.3.4	Center's Chief of Flight Operations shall establish re-qualification procedures for pilots not meeting any of the remaining requirements above in 3.4.3.4.	Center Chiefs of Flight Operations	
205	3.4.4	Flight proficiency shall be evaluated at least once per year by a NASA or NASA-designated pilot who is an instructor or examiner pilot in the aircraft used for the evaluation.	Center's Chief of Flight Operations	IAOP Review
206	3.4.5	Instrument flying proficiency shall be evaluated at least once per year using professional aeronautical standards such as FAA Instrument Practical Test Standards.	Center's Chief of Flight Operations	IAOP Review

207	3.4.7	Written tests shall be administered and reviewed annually by a check pilot to ensure current pilot knowledge of air traffic control procedures, aircraft systems, normal and emergency operating procedures, Agency and local instructions, and other pertinent regulations and procedures.	Check Pilot	IAOP Review
208	3.4.8	Pilot annual flight evaluations shall be reviewed by the Center's Chief of Flight Operations.	Center's Chief of Flight Operations	IAOP Review
209	3.4.9	Each Center's Chief of Flight Operations shall establish local instructions regarding training and currency requirements that must be met for a guest pilot/researcher.	Center's Chief of Flight Operations or designee	IAOP Review
210	3.4.10	The Center shall establish policies for flying media representatives.	Center Directors	IAOP Review
211	3.4.11	Flight Engineers shall possess an FAA Flight Engineer Certificate appropriate for the aircraft category or equivalent military certification.	Center's Chief of Flight Operations	IAOP Review
212	3.4.11.1	Centers shall develop alternate training programs to satisfy this requirement should the above personnel not be available.	Center Directors	IAOP Review
213	3.4.12	Qualified non-crewmembers shall be authorized by the Chief of Flight Operations to participate in flight operations to support mission requirements.	Chief of Flight Operations	IAOP Review
214	3.4.12.1	Qualified non-crewmembers shall be trained and will maintain qualification in accordance with local Center policies and procedures which shall, at a minimum, include cabin emergency and egress procedures and medical clearances.	Chief of Flight Operations	IAOP Review
215	3.5	Each primary crewmember must receive ground training as specified in section 4.13 with a refresher training every 12 months for pilots.	Center Directors	IAOP Review

216	3.6.1.1	Program managers shall conduct an MRR when multiple aircraft operations are to be conducted.	Program managers	IAOP Review
217	3.6.1.2	Prior to conducting an FRR/ORR, each individual aircraft involved in the flight or campaign shall have an approved Certificate of Airworthiness.	Center Directors	IAOP Review
218	3.6.2	The chair of the Center Airworthiness Process Program or a representative shall attend all readiness reviews.	Chair of the Center Airworthiness Process Program or a representative	IAOP Review
219	3.6.3	A supervisory Flight Operations pilot or other Flight Operations supervisory personnel shall chair and approve the FRR/ORR flight authorization.	A supervisory Flight Operations pilot or other Flight Operations supervisory personne	IAOP Review
220	3.6.4	Prior to conducting an MRR, each aircraft involved in the flight or campaign shall have an approved FRR/ORR.	Center Directors	IAOP Review
221	3.6.4.1	The program/project management of the flight/campaign event shall assign an individual who has authorization to proceed with the flight program to chair and make the MRR evaluation.	Program/project manager	IAOP Review
222	3.6.4.2	The MRR shall consider the following: a.) flight experiment and science flight requirements; b.) organizational and functional chart; c.) payload status; d.) flight operations procedures; e.) aircraft separation/coordination; f.) communication plan; g.) inter-Center/interagency communication/coordination plan; h.) ground operations procedures dealing with hazardous systems; i.) schedule timeline; j.) roles and responsibilities; k.) science coordination requirements; l.) pre-accident and/or incident notification	Center Directors	IAOP Review

		plan; m.) liability coverage; n.) deployment; o.) logistics; p.) public affairs/outreach; q.) mission assurance.		
223	3.6.5	Centers, Component Facilities, and contractors that do not have an aircraft operations department and operate NASA aircraft/UASs shall coordinate with an alternate NASA Center aircraft operations department for FRR/ORR and MRR services and support.	Center Directors	IAOP Review
224	4.2.1.1	When operated as civil aircraft, maintenance and aircrew standards shall meet the requirements for retention of FAA airworthiness certification and operation.	Center Directors	IAOP Review
225	4.2.1.2	The Certificate of Airworthiness shall be displayed per FAR 91.203 (a) and (b), Civil Aircraft: Certifications Required.	Center's Chief of Flight Operations	IAOP Review
226	4.2.1.3	Mission management flights shall be operated and maintained in accordance with FAR parts 21, 39, 43, 61, and 91 subparts A and B.	Center's Chief of Flight Operations	IAOP Review
227	4.2.1.4	Centers shall develop policies/procedures to operate mission management flights in accordance with the procedures specified in OMB Circular A-126 and 41 C.F.R., chapter 101-36.4, as well as the provisions of this chapter.	Center Directors	IAOP Review
228	4.2.2	Mission management flights shall be conducted only in support of activities that constitute the discharge of NASA's official responsibilities and only when the aircraft is not otherwise scheduled for "Mission Required" or "Required Use" flight operations.	Center Directors	IAOP Review
229	4.2.2.1	NASA employees shall not use mission management flights if commercial airlines, charter aircraft service, or ground transportation are reasonably available to meet the mission need, unless the flight is cost justified in accordance with OMB Circular A-126	Center Directors	IAOP Review

		and this chapter.		
230	4.2.3	Flights that require excessive deadheading or involve long, unproductive layovers shall be avoided, absent special emergency situations.	Center Directors	IAOP Review
231	4.2.4	Whenever practicable, inter-Center airlift requirements shall be combined.	Center Directors	IAOP Review
232	4.2.5	Each passenger traveling aboard NASA mission management flights shall be a U.S. Government employee or contractor on official U.S. Government business and have either an approved NASA travel authorization in accordance with NASA directives or a travel authorization approved by another Federal agency or Congressional committee.	Center Directors	IAOP Review
233	4.2.5	Travel authorized by another Federal agency or Congressional committee also shall be approved by an Official-in-Charge of a Headquarters Office or a NASA Center Director.	Center Directors	IAOP Review
234	4.2.5.2	The names of the passengers and purpose of travel for such passengers shall be documented in the mission management flight request form.	Center's Chief of Flight Operations	IAOP Review
235	4.2.5.3	Reimbursement by nonofficial travelers shall comply with section 4.7 of this chapter.	Center Directors	IAOP Review
236	4.2.6	All passengers shall be manifested on NASA Form 1269, Flight Itinerary and Passenger Manifest.	Center's Chief of Flight Operations	IAOP Review
237	4.2.6.1	Prior to departure of any mission management flight, the PIC shall certify the accuracy of the manifest and file a copy with a responsible ground agency such as a military, civil, or NASA operations office.	Pilot In Command	IAOP Review

238	4.2.7	NASA mission management flight operations shall be conducted under the cognizance of the Assistant Administrator for the Office of Strategic Infrastructure.	Assistant Administrator for the Office of Strategic Infrastructure	Flight Operations Performance Measurements and Reporting
239	4.3.1	Required Use designation shall be controlled solely by the NASA Administrator and approved according to section 4.4.2 of this chapter.	NASA Administrator	IAOP Review
240	4.3.2	All passenger travel that can reasonably be performed using commercial airlines, charter aircraft service, or ground transportation to meet the mission need may not be designated as Mission Required. Classification of a mission management (passenger or cargo) flight as Mission Required requires approval from the Assistant Administrator for the Office of Strategic Infrastructure before the flight and shall be coordinated with the HQ AD.	Assistant Administrator for the Office of Strategic Infrastructure	IAOP Review
241	4.3.3	Travel on mission management flights that are designated as Other Official Travel shall be authorized in advance on a trip-by-trip basis as detailed in section 4.4.	Center Directors	IAOP Review
242	4.3.3	NASA employees shall not use mission management flights for Other Official Travel if commercial airline, charter aircraft service, or ground transportation is reasonably available, unless the flight is cost justified in accordance with OMB Circular A-126 and this chapter.	Center Directors	IAOP Review
243	4.3.5	Other Official Travel that is not Required Use or Mission Required, as defined in 4.3.3 above, shall be authorized only when either: a.) No commercial airline or aircraft (including charter) service is reasonably available (i.e., able to meet the traveler's departure or arrival requirements within a 24-hour period), unless extraordinary circumstances require a shorter period to effectively fulfill Agency requirements;	Center Directors	IAOP Review

		OR b.) The actual cost of using a Government aircraft is not more than the cost of using commercial airline or aircraft (including charter service).		
244	4.3.5.1	Such cost justification shall be computed consistent with section 4.4.5.2 of this chapter.	Center Directors	IAOP Review
245	4.3.7	Use of NASA aircraft for passenger transportation purposes, regardless of travel classification category, shall follow the same requirements as used for all other mission management flights, including compliance with 41 C.F.R. 101-37 and OMB Circular A-126, flight request and approval using NASA Form 1653, cost justification on NASA Form 1653 as required, and obtaining travel authorization approvals.	Center Directors	IAOP Review
246	4.3.7.1	When operated as civil aircraft, maintenance and aircrew standards shall meet those required for retention of FAA airworthiness certification and operation and shall be followed for any NASA mission management flight that carries passengers.	Center Directors	IAOP Review
247	4.3.7.2	The Certificate of Airworthiness shall be displayed per FAR 91.203 (a) and (b).	Center Directors	IAOP Review
248	4.3.7.3	Centers shall exercise caution to ensure that aircraft are returned to their FAA-certificated configuration after being modified for Program Support or Research purposes.	Center Directors	IAOP Review
249	4.3.8	Nonofficial travel on NASA mission management flights shall be authorized only when all the following conditions are met: a.) the aircraft is already scheduled for use for an official purpose; b.) such nonofficial travel use does not require a larger aircraft than needed or alteration of flight itinerary for the official purpose; c.) nonofficial travel use results only in minor additional cost to the Government.	Center Directors	IAOP Review

250	4.3.8.1	All nonofficial travelers shall reimburse the U.S. Treasury in accordance with section 4.7.	Center Directors	IAOP Review
251	4.3.9	The Center Director shall certify, in writing, that nonofficial travel on a scheduled flight has met the above conditions.	Center Directors	IAOP Review
252	4.3.9.1	The Center shall retain this certification for a minimum of 2 years.	Center Directors	IAOP Review
253	4.4.1	All flights with passengers aboard NASA aircraft assigned to a Center shall be reviewed by the Center Chief Counsel for compliance with 41 C.F.R., part 101-37 and OMB Circular A 126, and approved in advance by the Center Director.	Center Directors	IAOP Review
254	4.4.1.1	In the case of aircraft assigned to HQ, those flights shall be reviewed by the General Counsel or Deputy General Counsel and approved in advance by the Assistant Administrator for the Office of Strategic Infrastructure.	Assistant Administrator for the Office of Strategic Infrastructure	IAOP Review
255	4.4.1.2	All flights classified as Other Official Travel that have Senior Federal Officials aboard shall be reviewed by the General Counsel and approved in advance by the appropriate NASA HQ or Center approval authority.	Center Directors	IAOP Review
256	4.4.2	Mission management flights also shall be approved in advance, in writing, and generally on a trip-by-trip basis.	Center Directors	IAOP Review
257	4.4.2.1	The Administrator shall in each instance determine the appropriateness of Required Use flights following a finding of compliance with OMB Circular A-126 requirements by the General Counsel.	NASA Administrator	IAOP Review
258	4.4.2.2	While the Administrator may make a blanket determination that all use of NASA aircraft by certain employees, or travel in specified categories, qualifies as Required Use travel, such	NASA Administrator	IAOP Review

		determinations shall likewise be in writing, be determined to be compliant with OMB Circular A-126 requirements by the General Counsel, and set forth the justification for that determination.		
259	4.4.2.3a	The Center Director shall complete the following when a member of the flightcrew also is considered a passenger: The justification shall be annotated in the remarks section of NASA Form 1653.	Center Directors	IAOP Review
260	4.4.2.3b	The Center Director shall complete the following when a member of the flightcrew also is considered a passenger: The flightcrew member shall have either a NASA travel authorization approved in accordance with NASA directives or a travel authorization approved by another Federal agency or Congressional committee for purposes or activities beyond their crew flight duties.	Center Directors	IAOP Review
261	4.4.2.3c	The Center Director shall complete the following when a member of the flightcrew also is considered a passenger: The flightcrew member shall be listed as a passenger on Form 1653.	Center's Chief of Flight Operations	IAOP Review
262	4.4.2.3d	The Center Director shall complete the following when a member of the flightcrew also is considered a passenger: If the flightcrew member is a Senior Federal Official, a family member of such Senior Federal Official, or a non-Federal traveler, the flight request shall be reviewed by the General Counsel.	Center Directors	IAOP Review
263	4.4.3	Flights classified as Mission Required where NASA personnel are traveling to meet mission requirements also shall be reviewed by the General Counsel and approved in advance by the Assistant Administrator for the Office of Strategic Infrastructure.	Assistant Administrator for the Office of Strategic Infrastructure	IAOP Review

264	4.4.3	The Assistant Administrator for the Office of Strategic Infrastructure shall ascertain, prior to authorizing the flight, that the purpose of the trip is for Mission Required travel as described in section 4.3.2.	Assistant Admin-istrator for the Office of Strategic Infrastructure	IAOP Review
265	4.4.3	Should special emergency situations preclude preflight review and approval, immediate action to review and approve the flight shall be taken as soon as practicable following the flight.	Center Directors	IAOP Review
266	4.4.3.1	Flights classified as Mission Required conducted on Research or Program Support aircraft, where passengers are aboard but the primary purpose of the flight is not passenger transport, may be approved at the Center Director level with Center Counsel review. General Counsel shall review the flight in advance if a Senior Federal Official, families of such Senior Federal Officials, or non-Federal travelers are passengers.	General Counsel	IAOP Review
267	4.4.3.1	Authorization shall be coordinated with the HQ AD.	Center Directors	IAOP Review
268	4.4.3.1	A Mission Management Flight Request (NASA Form 1653) is required, and the passenger manifest (NASA Form 1269) shall clearly distinguish aircrew from passengers.	Center Directors	IAOP Review
269	4.4.3.1	The remarks section of the NASA Form 1653 shall indicate what training and for whom the flight is being conducted.	Center Directors	IAOP Review
270	4.4.4	Travel by the following categories of people must be authorized in advance and in writing when traveling aboard mission management flights on Other Official Travel: a.) Senior Federal Officials; b.) members and families of such Senior Federal Officials; c.) non-Federal travelers.	Center Directors	IAOP Review

271	4.4.4	Status of the following categories of people shall be annotated on the flight request and manifest: a.) Senior Federal Officials; b.) members and families of such Senior Federal Officials; c.) non-Federal travelers.	Center Directors	IAOP Review
272	4.4.4.2a	Authorizations for Other Official Travel flights with Senior Federal Officials, families of such Senior Federal Officials, and non-Federal travelers aboard shall be reviewed in advance on a trip-by-trip basis by the Center Chief Counsel.	Center Directors	IAOP Review
273	4.4.4.2b	Authorizations for Other Official Travel flights with Senior Federal Officials, families of such Senior Federal Officials, and non-Federal travelers aboard shall be approved by the Center Director.	Center Directors	IAOP Review
274	4.4.4.2c	Authorizations for Other Official Travel flights with Senior Federal Officials, families of such Senior Federal Officials, and non-Federal travelers aboard shall be reviewed by the NASA General Counsel.	General Counsel	IAOP Review
275	4.4.4.3	At NASA HQ, all flights shall be reviewed by the General Counsel and approved in advance by the Assistant Administrator for the Office of Strategic Infrastructure.	Assistant Admin-istrator for the Office of Strategic Infrastructure	IAOP Review
276	4.4.4.4	Other Official Travel flights on Center-assigned aircraft with no Senior Federal Officials aboard shall be reviewed by the Center Chief Counsel and approved by the Center Director without HQ review.	Center Directors	IAOP Review
277	4.4.5	When a mission management flight is for Other Official Travel, the approving official shall determine that one of the following criteria has been satisfied: a.) no commercial aircraft or airline service is reasonably available in accordance with paragraph 4.3.4.1; OR b.) the actual cost of mission management flights does not exceed the cost of using commercial	Center Directors	IAOP Review

		<p>airlines or aircraft (including charter service). For such "cost-justified flights," the cost of using commercial airline or aircraft services for justifying the use of Government aircraft shall: (1) be the current Government contract fare or price or the lowest fare or price known to be available for the trip(s) in question; (2) include any differences in the costs of any additional ground or air travel, per diem and miscellaneous travel (e.g., taxis, parking), and lost employee work time (computed at gross hourly costs to the Government, including benefits) between commercial air, charter air service, and Government aircraft. To capture the cost, including fringe benefits, of the employee's lost work time, a multiplier of 1.3285 must be applied to the locality-adjusted hourly salaries of the individual travelers for the additional travel time. The hourly salaries of the travelers are determined by dividing the applicable current average annual salaries that are provided by the NASA Workforce Web site by 2,087. Selecting the "Average Salaries by Occupation and Center (table)" view will provide access to the necessary data to determine average salaries by occupation and grade for each Center. While Federal salary data can be found at many other locations, the NASA Workforce Web site is the official NASA source. Travel time is defined as the time required to travel from the office or home until arrival at the business location or hotel, whichever is earliest.</p>		
278	4.5.1a	<p>The Assistant Administrator for the Office of Strategic Infrastructure shall approve policies and other matters involving NASA mission management flights (except those specifically outlined above) and ensuring that the number of NASA-owned aircraft and their capacity to carry passengers and</p>	<p>Assistant Administrator for the Office of Strategic Infrastructure</p>	<p>IAOP Review</p>

		cargo does not exceed the level necessary to meet NASA's mission requirements.		
279	4.5.1b	The Assistant Administrator for the Office of Strategic Infrastructure shall coordinate acquisition, assignment, or disposition of aircraft whose primary purpose is the conduct of mission management flights with the appropriate Associate Administrators and Center Directors in accordance with OMB Circular A-76.	Assistant Administrator for the Office of Strategic Infrastructure	IAOP Review
280	4.5.1c	The Assistant Administrator for the Office of Strategic Infrastructure shall annually review mission management flight requirements, use, and associated costs, including variable cost rates for each aircraft used to conduct mission management flights.	Assistant Administrator for the Office of Strategic Infrastructure	IAOP Review
281	4.5.1d	The Assistant Administrator for the Office of Strategic Infrastructure shall periodically review the need for all NASA aircraft whose primary purpose is mission management flight operations, and the cost effectiveness of NASA mission management flight operations in accordance with the requirements of OMB Circular A-76. Each such review of NASA-owned aircraft whose primary purpose is mission management flight operations shall be submitted to the General Services Administration when completed and to OMB with NASA's next budget submission.	(This is actually two requirements in one) Assistant Administrator for the Office of Strategic Infrastructure	IAOP Review
282	4.5.1e	The Assistant Administrator for the Office of Strategic Infrastructure shall ensure that current (by fiscal year) variable cost rate for each aircraft utilized to conduct mission management flights is used by all NASA officials who operate and account for NASA mission management flights to calculate the flight-by-flight cost justification required by OMB Circular A-126.	Assistant Administrator for the Office of Strategic Infrastructure	IAOP Review

283	4.5.2a	Center Directors shall ensure that aircraft are used properly and that the functions, including contract functions, performed by their aircraft comply, at a minimum, with NASA, FAA, OMB, and other Federal requirements, policies, and procedures.	Center Directors	IAOP Review
284	4.5.2b	Center Directors shall ensure compliance with 41 C.F.R., part 101-37 and OMB Circular A-126.	Center Directors	IAOP Review
285	4.5.2c	Center Directors shall approve the use of their assigned aircraft to conduct mission management flights where passenger transport is not the primary mission.	Center Directors	IAOP Review
286	4.5.2d	Center Directors shall designate aircrew to conduct mission management flights and ensure continuing compliance with all governing regulations.	Center Directors	IAOP Review
287	4.5.2e	Center Directors shall establish variable cost rates for aircraft under their control that are, or may be, used for passenger transportation. The rate will be developed using OMB Circular A-126, attachments A and B, incorporating the most recent 12 months of historical cost data available and shall be used to determine the cost justification for mission management flight requests. The rate shall be reported to the HQ AD not later than September 15 of each year and cannot be used until approved by that office.	Center Directors (three requirements)	IAOP Review
288	4.5.2f	Center Directors shall annually review and document the Center's continuing need for aircraft whose primary purpose is the transport of passengers and the cost-effectiveness of such aircraft operations, as required by OMB Circular A-126 and reflected in the NASA Financial Management Requirements and guidance from the HQ AD. Content of this review must include, in narrative format, a comparison of the past years' use with future requirements. Upon	Center Directors	IAOP Review

		completion of the annual review, a copy shall be forwarded to the HQ AD not later than October 31 of each year.		
289	4.5.2f	When Government ownership of an aircraft is no longer justified, Center Directors shall identify such aircraft to the Assistant Administrator for the Office of Strategic Infrastructure for reassignment or disposal.	Assistant Administrator for the Office of Strategic Infrastructure	IAOP Review
290	4.5.2g	Center Directors shall submit a monthly report of mission management flight data to the HQ AD to arrive not later than the 20th of the next month. This data must include all available mission management flight and request records for NASA aircraft under the control of the Center Director and must reflect every flight flown by aircraft that has been, or may be, approved to transport passengers regardless of whether the passengers were aboard that flight. At a minimum, the following are to be provided: a.) NASA Form 1653, Mission Management Flight Request; b.) NASA Form 1269, Flight Itinerary and Manifest; c.) Cost Calculation Spreadsheet; d.) NASA Aircraft Management Information System (NAMIS) Form 1672, Aircraft Log.	Center Directors	IAOP Review
291	4.5.2h	Certification documentation demonstrating compliance with paragraph 4.3.5 for any nonofficial travel use and documentation of the required reimbursement described in section 4.7 shall be included in the monthly mission management flight data submission. This responsibility may be delegated.	Center Directors	IAOP Review
292	4.5.4.2a	For subpanels, the IAOP chair shall ensure that subpanel members are Chiefs of Aircraft Operations and Chiefs of Aircraft Maintenance or their designees, as well as a representative from the HQ AD who shall act as permanent executive secretary.	IAOP Chair	IAOP Review

293	4.5.4.2b	For subpanels, the IAOP chair shall ensure that subpanels will be convened at least annually in formal meetings; however, the subpanels shall act as standing committees subject to call by the chairperson to review urgent business. Informal meetings may be conducted by teleconference.	IAOP Chair	IAOP Review
294	4.5.5.1	All crewmembers shall comply with the provisions set forth in this NPR and with FAA and OEM publications for their aircraft and other applicable directives, regulations, and instructions.	Center Directors	IAOP Review
295	4.5.6	A fully qualified pilot shall be designated as PIC and charged with the responsibility of conducting each NASA mission management flight.	Pilot in Command	IAOP Review
296	4.5.7	The pilot assigned to duty as Second in Command during flight shall be qualified as either a PIC or SIC as specified in paragraph 4.11.4.	Pilot in Command	IAOP Review
297	4.6.1.1	NASA's aircraft programs shall be included in NASA's Management Control Plan and comply with the internal control requirements of OMB Circular A-123.	Center Directors	IAOP Review
298	4.6.1.1	Any material weaknesses found shall be reported in the next annual internal control report to the President and Congress.	Center Directors	IAOP Review
299	4.6.1.4	Records of all mission management flight operations shall be retained for at least 2 years and must include, at a minimum: a.) the tail number of the plane used; b.) the date(s) used; c.) the name(s) of the pilot(s) and flightcrew; d.) the purpose(s) of the flight; e.) the route(s) flown; f.) the names and status of all passengers on all legs of the mission.	Center Directors	IAOP Review

300	4.6.2a	Center Directors shall ensure monthly submission of mission management flight data to the HQ AD as required in paragraph 4.5.2.7.	Center Directors	IAOP Review
301	4.6.2b	Center Directors shall annually review and document the Center's continuing need for aircraft whose primary purpose is the transport of passengers and the cost-effectiveness of such aircraft operations, as required by OMB Circular A-126 and reflected in the NASA FMR and guidance from the HQ AD. Content of this review is to include, in narrative format, a comparison of the past years' use with future requirements. Upon completion of the annual review, a copy will be forwarded to the HQ AD not later than October 31 of each year.	Center Directors	IAOP Review
302	4.6.2c	Center Directors shall ensure the establishment of variable cost rates for each fiscal year for aircraft under their control that are, or may be, used for passenger transportation. This rate is to be used to determine cost justification for mission management flight requests and shall be reported to the HQ AD not later than September 15 of each year.	Center Directors	IAOP Review
303	4.6.2d	The variable rate will be developed per OMB Circular A-126, attachments A and B, using the most recent 12 months of historical cost data available. The Center variable rate shall be approved by HQ AD prior to being applied at the beginning of each FY.	Center Directors	IAOP Review
304	4.6.2d	If, during the FY, a Center needs to adjust the variable rate, substantiation shall be submitted and approved prior to being applied.	Center Directors	
305	4.7.1	Reimbursement for nonofficial travel use shall be made in advance of the flight for travel on FAA aircraft, consistent with current FAA procedures.	Center Directors	IAOP Review

306	4.7.2	Reimbursement for nonofficial travel use of NASA-owned or -controlled aircraft shall be made in advance of the flight.	Center Directors	IAOP Review
307	4.7.3	Any flight involving nonofficial travelers shall require notification to the HQ AD prior to the flight to ensure application of the Agency-wide procedures for reimbursement.	Center Directors	IAOP Review
308	4.8.2	NASA aircraft used to conduct mission management flights shall meet the FAA certification standards required of mission management flights.	Center Directors	IAOP Review
309	4.8.3	Airworthiness of NASA mission management flights shall, at a minimum, meet the standards set forth in the Federal Aviation Regulations for similar business-type aircraft.	Center Directors	IAOP Review
310	4.8.3	Aircraft whose primary or secondary purpose is the transport of passengers shall be maintained as required for retention of FAA airworthiness certification.	Center Directors	IAOP Review
311	4.8.4	The cost of operation and the utilization of mission management flights shall be reported in accordance with Financial Management Manual 9353-6 (RCS-10-0000-00271) and OMB Circular A-126.	Center Directors	IAOP Review
312	4.9.1	NASA-owned and -controlled aircraft, including lease and charter, whose primary purpose is to meet other mission requirements of research or program support, are public aircraft and are not authorized to carry passengers, even if the classification of the flight is Mission Required, without written approval from the Assistant Administrator for the office of StrategicInfrastructure prior to such use. Approval shall be coordinated with the HQ AD.	Center Directors	IAOP Review

313	4.9.1	The use of a NASA aircraft to provide passenger transportation shall be restricted to circumstances where such use does not conflict with program support or research operations.	Center Directors	IAOP Review
314	4.9.1.1	Centers shall document the justification for and approval of each flight used for mission management purposes and retain the documentation for 2 years.	Center Directors	IAOP Review
315	4.10.1	When deviations from this NPR are necessary, Center Directors shall submit requests for deviations or waivers to the Assistant Administrator for the Office of Strategic Infrastructure.	Center Directors	IAOP Review
316	4.11.2	A training file shall be maintained for each flightcrew member.	Center's Chief of Flight Operations	IAOP Review
317	4.11.3	Pilots of aircraft used for mission management flights shall possess a current FAA First Class Medical Certificate.	Center's Chief of Flight Operations	IAOP Review
318	4.11.3	Flight Maintenance Technicians shall possess a valid FAA Third Class Medical Certificate or NASA medical certificate issued within the past 12 months by a NASA-approved medical examiner.	Center's Chief of Flight Operations	IAOP Review
319	4.11.4	PICs/SICs shall possess an FAA Airline Transport Pilot (ATP) Certificate with appropriate category, class, and type rating in the aircraft assigned.	Center's Chief of Flight Operations	IAOP Review
320	4.11.4	To be designated an aircraft commander, the pilot shall meet the following minimum flight experience requirements: a.) 2,500 pilot hours (500 hours multiengine); b.) 100 pilot hours in type.	Center Directors	IAOP Review
321	4.11.5	Instructor pilots shall be selected by the Center's Chief of Flight Operations from highly qualified PICs who have demonstrated the skill, maturity, and temperament to perform instructor duties.	Center's Chief of Flight Operations	IAOP Review

322	4.11.7	Flight maintenance technicians shall possess an FAA A&P Certificate.	Center's Chief of Flight Operations	IAOP Review
323	4.13.1	Each primary crewmember shall receive basic survival training on a one-time basis.	Center's Chief of Flight Operations	IAOP Review
324	4.13.1	Additional survival training shall be required by appropriate Center management for those crewmembers engaged in frequent over-water or remote-area flights.	Center's Chief of Flight Operations	IAOP Review
325	4.13.1	Newly assigned personnel with no previous survival training shall complete this requirement within 12 months of being assigned to flightcrew duties.	Center's Chief of Flight Operations	IAOP Review
326	4.13.1	Pilots shall not be assigned as PIC until this requirement has been met.	Center's Chief of Flight Operations	IAOP Review
327	4.13.2	Prior to initial designation, primary crewmembers shall receive instruction in the physiological aspects of high-altitude flight including altitude chamber indoctrination or recognized equivalent training (ie Reduced Oxygen Breathing Device training).	Center's Chief of Flight Operations	IAOP Review
328	4.13.2	Refresher training academics shall be accomplished every 5 years.	Center's Chief of Flight Operations	IAOP Review
329	4.13.3	Prior to initial designation and annually thereafter, each crewmember shall receive emergency egress training on each type of aircraft assigned.	Center's Chief of Flight Operations	IAOP Review
330	4.13.3	Training shall include instruction on the location and operation of normal and emergency exits and cabin emergency equipment, such as fire extinguishers and life vests.	Center's Chief of Flight Operations	IAOP Review

331	4.13.4	Each primary crewmember shall complete an approved formal course of instruction in the type aircraft to be flown, including a study of the systems and procedures applicable to the individual's crew position.	Center's Chief of Flight Operations	IAOP Review
332	4.13.5	A formal systems training course shall be required every 6 months for pilots and every 18 months for flight maintenance technicians.	Center's Chief of Flight Operations	IAOP Review
333	4.13.6	Maintenance Technicians shall attend refresher training that addresses changes to aircraft systems, test equipment, or critical troubleshooting and repair techniques every 24 months.	Center's Chief of Flight Operations	IAOP Review
334	4.14.1	Flight training shall be conducted under the supervision of a NASA-designated flight instructor pilot or an FAA-certified flight instructor, either in an approved simulator or in an aircraft.	Center's Chief of Flight Operations	IAOP Review
335	4.14.2	Prior to initial designation, each pilot shall receive a minimum of 10 hours of flight training, 8 hours of which may be conducted in a simulator.	Center's Chief of Flight Operations	IAOP Review
336	4.14.3	In each 6-month period, pilots shall receive a minimum of 6 hours of flight or simulator training.	Center's Chief of Flight Operations	IAOP Review
337	4.14.4	Prior to initial designation, each maintenance technician shall receive training in such areas as traffic awareness and "see-and-avoid" techniques, aircraft servicing, weight and balance, and passenger care.	Center's Chief of Flight Operations	IAOP Review
338	4.15.1	Only crewmembers who have completed their required training shall be used as required crewmembers on any passenger missions.	Center's Chief of Flight Operations	IAOP Review
339	4.16.1	All flight crew currency documentation shall be recorded in the NASA standard application, NASA Aircraft Management Information System (NAMIS).	Center's Chief of Flight Operations	IAOP Review

340	4.16.2	In the interest of flight safety and to ensure that all crewmembers have the opportunity to exercise their aeronautical skills and thereby maintain the proficiency level for which they have been trained, the minimum currency requirements set forth in Table 4.2 shall be met.	Center's Chief of Flight Operations	IAOP Review
341	4.16.2.1d	Private pilot time shall not be recorded in NASA information systems or utilized to meet any of the above proficiency requirements.	Center's Chief of Flight Operations	IAOP Review
342	4.16.2.2	To maintain currency, flight maintenance technicians shall have flown at least three passenger missions each calendar quarter, or they must be accompanied by a current flight maintenance technician.	Center's Chief of Flight Operations	IAOP Review
343	4.17.1.1	A pilot at the controls who does not meet the 90-day total hour requirements, but is otherwise current, shall increase all instrument approach minimums by 200 feet and 1/2-mile visibility (or the Runway Visual Range equivalent).	Center's Chief of Flight Operations	IAOP Review
344	4.17.1.3	At the discretion of the Chief Pilot, pilots flying multiple types of aircraft who have met the all-types requirements may satisfy the in-type currency requirement by flying a training flight with a flight instructor. This training flight shall include a minimum of two instrument approaches, three takeoffs, and three landings.	Center's Chief of Flight Operations	IAOP Review
345	4.17.1.5	Lapse in qualification greater than 90 days requires retraining of at least 6 hours dedicated flight or simulator training as determined by the Center's Chief of Flight Operations and requires a formal flight evaluation by an instructor pilot.	Center's Chief of Flight Operations	IAOP Review

346	4.18.1	The intent of the NASA flightcrew evaluation program is to objectively evaluate aircrew performance and, thereby, measure the effectiveness of the training program. Designated Instructor Pilots shall administer all flight checks.	Center's Chief of Flight Operations	IAOP Review
347	4.18.1	An IP shall be designated for all flights in which instruction or evaluation is planned.	Center's Chief of Flight Operations	IAOP Review
348	4.18.2	Prior to being designated in their crew position, and annually thereafter, pilots shall complete a proficiency evaluation flight conducted by a NASA-designated IP or an FAA-designated flight IP.	Center's Chief of Flight Operations	IAOP Review
349	4.18.2	Pilots with overdue proficiency checks shall be scheduled only on training flights (i.e., non-passenger flights) with an instructor pilot.	Center's Chief of Flight Operations	IAOP Review
350	4.18.3	Prior to being designated an aircraft commander and annually thereafter, pilots shall complete a line evaluation flight conducted by an IP.	Center's Chief of Flight Operations	IAOP Review
351	4.18.3	Pilots with overdue line checks shall not be scheduled as a PIC until a check is completed.	Center's Chief of Flight Operations	IAOP Review
352	4.18.4	Flight checks conducted by NASA IPs shall be recorded on NASA Form 1615 or Center equivalent, reviewed by the Center's Chief of Flight Operations, and filed in the individual's training file.	Center's Chief of Flight Operations	IAOP Review
353	4.19.1a	In addition to approving the use of mission management flights, the Assistant Administrator for the Office of Strategic Infrastructure and the Center Directors shall ensure that the most cost-effective aircraft is used to satisfy approved requirements. Exceptions to this usage shall be documented in writing.	Center Directors	IAOP Review

354	4.19.1b	In addition to approving the use of mission management flights, the Assistant Administrator for the Office of Strategic Infrastructure and the Center Directors shall coordinate trip itineraries and requirements with other NASA activities that could benefit from the use of available seats on each trip.	Center Directors	IAOP Review
355	4.20.1	All personnel scheduled as primary flight crewmembers on NASA mission management flights shall be trained and qualified in accordance with this paragraph of this NPR.	Center's Chief of Flight Operations	IAOP Review
356	4.20.1	Crew assignment, including identification of PIC, shall be designated in writing for each flight.	Center's Chief of Flight Operations	IAOP Review
357	4.20.2	No aircraft carrying passengers shall be operated with less than the minimum basic crew specified below.	Center's Chief of Flight Operations	IAOP Review
358	4.21.2	Basic crew duty time shall not be scheduled to exceed 14 consecutive hours except as set forth below.	Center's Chief of Flight Operations	IAOP Review
359	4.21.2.2	Augmented crew duty time shall not be scheduled to exceed 18 consecutive hours.	Center's Chief of Flight Operations	IAOP Review
360	4.21.2.2	Flights requiring augmentation shall be approved by the Center's Chief of Flight Operations and documented and maintained on file for a period of 12 months.	Center's Chief of Flight Operations	IAOP Review
361	4.21.2.3	Relief crews shall be pre-positioned if the mission schedule cannot be supported within the duty time limitations specified for a single or augmented crew.	Center's Chief of Flight Operations	IAOP Review
362	4.22.2.1	Crew rest shall normally provide at least 10 consecutive hours free of all official duties.	Center's Chief of Flight Operations	IAOP Review

363	4.22.2.2	At en route stops, crew rest shall not commence until 1 hour after termination of the mission in order to allow for necessary post-flight duties.	Center's Chief of Flight Operations	IAOP Review
364	4.22.2.3	The crew rest period shall end 1 hour prior to the crew beginning official duties in preparation for departure, normally at least 1 hour prior to scheduled takeoff time.	Center's Chief of Flight Operations	IAOP Review
365	4.22.2.4	Approvals for reduced crew rest shall be limited to one occurrence per crewmember during any 7-day period.	Center's Chief of Flight Operations	IAOP Review
366	4.22.2.4	Such approvals shall be documented and maintained on file for a period of 12 months.	Center's Chief of Flight Operations	IAOP Review
367	4.23.1	Flightcrew members shall not be scheduled, nor permitted, to function as members of mission management flightcrews, if their total professional flying time exceeds the flight hours shown in table 4-3.	Center's Chief of Flight Operations	IAOP Review
368	4.24.1	Hazardous material as defined in 49 C.F.R. 171.8 shall not be transported aboard NASA mission management flights.	Center Directors	IAOP Review
369	4.24.1	Cargo to be shipped shall be routed through the Center's transportation office before acceptance or, if en route, cargo normally only shall be accepted from a certified shipper or freight forwarding agency.	Center Directors	IAOP Review
370	4.25.1	During all critical flight operations, cockpit activities and conversation shall be limited to those involved with the direct operation of the aircraft.	Pilot in Command	IAOP Review
371	4.26.1	Before departure, the PIC shall brief the crew on all essential information concerning the flight including weather, restrictions, and the duties and responsibilities of each flightcrew member.	Pilot in Command	IAOP Review

372	4.27.1a	In those instances when, in the determination of the PIC, an extenuating circumstance requires loading or unloading passengers or cargo with an engine running only the engine on the opposite side of the aircraft from the loading door shall be operating and shall be operated at as low a power setting as practical.	Pilot in Command	IAOP Review
373	4.27.1b	In those instances when, in the determination of the PIC, an extenuating circumstance requires loading or unloading passengers or cargo with an engine running a flightcrew member shall be positioned on the ground to ensure that passengers do not approach close to an operating engine or windmilling propeller.	Pilot in Command	IAOP Review
374	4.27.2	The PIC shall ensure that all passengers have been briefed on the Disclosure for Persons Flying Aboard Federal Government Aircraft (see appendix C-2).	Pilot in Command	IAOP Review
375	4.27.3	Thorough flight planning is essential to the safe and efficient conduct of mission management flights. A flight plan shall be filed for each flight.	Pilot in Command	IAOP Review
376	4.27.3	Passenger flights shall be operated under instrument flight rules and, to the maximum extent possible, in controlled airspace; however, daylight flights of less than 100 nautical miles may be operated under visual flight rules if weather conditions permit.	Pilot in Command	IAOP Review
377	4.27.4	Considering weather forecasts and any known en route delays, the minimum amount of useable fuel required at takeoff shall be sufficient to do the following: a.) complete the flight to the destination airport; b.) fly from that airport to the alternate airport, if required; c.) fly after that for one additional hour using cruise fuel consumption at 10,000 feet mean sea level.	Pilot in Command	IAOP Review

378	4.27.5	Prior to takeoff, the PIC shall receive a thorough weather briefing concerning current weather and forecasts for the proposed route, destination, and alternate destination.	Pilot in Command	IAOP Review
379	4.27.5.1	Weather minimums for takeoff shall be not less than landing minimums unless a takeoff alternate is available.	Pilot in Command	IAOP Review
380	4.27.5.2a	The PIC of a mission management flight shall not file a flight plan requesting clearance into areas of reported or forecast severe icing conditions.	Pilot in Command	IAOP Review
381	4.27.5.2b	Airborne radar shall be operative for any flight into areas where current weather reports or forecasts indicate that thunderstorms may reasonably be expected and flight under daylight visual meteorological conditions is not possible.	Pilot in Command	IAOP Review
382	4.27.5.2c	All flights shall be planned to circumnavigate areas of thunderstorm activity.	Pilot in Command	IAOP Review
383	4.27.5.3a	If the destination weather is reported and forecast to be less than a 2,000-foot ceiling or less than 3-mile visibility from 1 hour before until 1 hour after the estimated time of arrival (ETA), an alternate airport shall be listed on the flight plan.	Pilot in Command	IAOP Review
384	4.27.5.3b	Airport weather minimums shall meet or exceed the requirements of FAR part 91.	Pilot in Command	IAOP Review
385	4.27.6	When the pilot has less than 100 hours PIC experience in the type (make and model) aircraft being operated, the minimum descent altitude or the Decision Altitude and visibility landing minimums shall be increased by 200 feet and 1/2 mile (or the RVR equivalent) for all instrument approaches conducted by that pilot.	Pilot in Command	IAOP Review
386	4.27.6	In no case shall the landing minimums be less than a 400-foot ceiling and 1-mile visibility.	Pilot in Command	IAOP Review

387	4.27.6	Takeoffs shall not be made if the airfield is below these adjusted landing minimums.	Pilot in Command	IAOP Review
388	4.27.7	Prior to activating any aircraft system, aircraft maintenance forms shall be reviewed and evaluated.	Pilot in Command	IAOP Review
389	4.27.7	Prior to flight, the PIC shall accept the aircraft by signing the form. DoD aircraft forms, Naval Aviation Logistics Command Management Information System (NALCOMIS), or equivalent forms may be used as a substitute for specific NASA forms.	Pilot in Command	IAOP Review
390	4.27.8	A copy of the current weight and balance data shall be carried aboard each mission management flight.	Pilot in Command	IAOP Review
391	4.28.1	On departure, navigational aids shall be set up to aid in a possible expedited emergency return, as well as to aid in establishing the initial en route course.	Pilot in Command	IAOP Review
392	4.28.2	If installed and operative, the CVR and FDR shall be turned on during the entire flight.	Pilot in Command	IAOP Review
393	4.28.2	Should an incident occur, the CVR and FDR power shall be removed and appropriate circuit breakers pulled following completion of the after-shutdown checklist.	Pilot in Command	IAOP Review
394	4.28.3	EGPWS/TAWS shall be used on all flights.	Pilot in Command	IAOP Review
395	4.28.3	Immediate and appropriate action shall be taken in response to all valid EGPWS/TAWS warning calls.	Pilot in Command	IAOP Review
396	4.28.4	Landing lights shall be used during all takeoffs and landings and when operating near airports or in high-density traffic areas.	Pilot in Command	IAOP Review
397	4.28.6	Flight Maintenance Technicians shall remain at their duty station throughout the climb and descent.	Pilot in Command	IAOP Review

398	4.28.7	TCAS/TCAD resolution advisories shall be followed.	Pilot in Command	IAOP Review
399	4.29.1	In-flight delays and readily discernible abnormal conditions shall be explained to the passengers.	Pilot in Command	IAOP Review
400	4.29.1.1	The PIC shall require that all passengers and crewmembers have safety belts securely fastened for taxiing, takeoffs, landings, and before entering an area of in-flight turbulence.	Pilot in Command	IAOP Review
401	4.29.1.2	Passengers shall not be admitted to the flight deck during "sterile cockpit" phases of flight.	Pilot in Command	IAOP Review
402	4.29.2	The PIC shall notify ATC of the aircraft "minimum fuel" status at any time the fuel supply has reached a quantity where, upon reaching destination, little or no delay can be accepted. In no case may this quantity be less than that specified in table 4-6.	Pilot in Command	IAOP Review
403	4.29.2	If fuel remaining indicates a need for traffic priority to ensure a safe landing, the PIC shall formally declare an emergency due to low fuel and shall report fuel remaining in minutes.	Pilot in Command	IAOP Review
404	4.29.3	When an emergency or in-flight difficulty arises, the crew shall complete the checklists and report the nature and extent of the difficulty, intentions, and assistance required to the controlling ground agency.	Pilot in Command	IAOP Review
405	4.29.3	In the event of an engine failure or shutdown, the aircraft shall land at the nearest suitable airport at which a safe landing can be made.	Pilot in Command	IAOP Review
406	4.30.1	During instrument arrivals, all available navigational aids shall be used. When available, precision approach guidance (Instrument Landing System or Precision Approach Radar) will be used for all night arrivals except for specific events during training flights.	Pilot in Command	IAOP Review

407	4.30.2	Pilots operating aircraft shall land the aircraft only when the flight visibility is equal to or greater than the visibility prescribed in the standard instrument approach procedure being used.	Pilot in Command	IAOP Review
408	4.30.4	Before starting an approach, the pilot flying shall brief the crew on the procedures to be followed during the approach and landing and in the event of a missed approach. The briefing will include a review of the procedure to be flown, including key altitudes and restrictions, as well as specific crew duties during the approach and landing.	Pilot in Command	IAOP Review
409	4.30.5a	During approach, the pilot shall set up to execute a stabilized approach to landing. The optimum stabilized approach is defined as a flight on the glide path (visual or electronic) at a steady rate of descent, on the "target" approach speed, in the landing configuration, in trim, and with the proper thrust setting.	Pilot in Command	IAOP Review
410	4.30.5b	During approach, a stabilized approach shall be established by 1,000 feet above airport elevation in instrument meteorological conditions (IMC) and by 500 feet above airport elevation in visual meteorological conditions (VMC).	Pilot in Command	IAOP Review
411	4.30.5c	During approach, the pilot flying the approach shall announce his/her progress and intentions periodically.	Pilot in Command	IAOP Review
412	4.30.5d	During approach, the pilot monitoring shall observe the approach and provide a continual cross-check of the navigational aids, instruments, air traffic control instructions, and approach procedures.	Pilot in Command	IAOP Review
413	4.30.5e	During approach, any deviations from the prescribed procedure shall immediately be brought to the attention of the pilot flying.	Pilot in Command	IAOP Review

414	4.30.5f	During approach, the pilot monitoring shall call out "1,000 feet above" and "100 feet above" all key altitudes, as well as "minimums" upon reaching the Missed Approach position.	Pilot in Command	IAOP Review
415	4.30.5g	During approach, when the runway is in sight, the pilot monitoring shall state, "runway in sight."	Pilot in Command	Check Flight
416	4.30.5h	During approach, if the runway is not in sight when the aircraft reaches the Missed Approach point, the pilot monitoring shall state, "go around."	Pilot in Command	Check Flight
417	4.30.6	To prevent excessive loss of altitude in the event of an autopilot failure, the pilot directing the aircraft shall maintain flight control contact throughout the final portion of an automatic coupler approach. Full manual control shall be assumed at or above published minimum altitude.	Pilot in Command	IAOP Review
418	4.31.1	On completion of the flight, the PIC shall ensure the flight plan is closed with the appropriate facility.	Pilot in Command	IAOP Review
419	4.31.2	The PIC shall take prudent measures to secure and protect the aircraft at en route stops.	Pilot in Command	IAOP Review
420	4.31.2	State Department Advisories and the DoD Foreign Clearance Guide shall be consulted for out-of-continental United States operations.	Pilot in Command	IAOP Review
421	4.31.3	The flightcrew shall enter in the aircraft flight log each mechanical irregularity discovered during the flight. All unusual events (e.g., overweight or hard landings, lightning or bird strike, static discharge, or flight through hail or severe turbulence) will be recorded in the aircraft log.	Pilot in Command	IAOP Review

422	4.32.1	Aircraft flight manual data shall be used to ensure adequate takeoff, climb, approach, and landing performance is available for the actual conditions encountered.	Pilot in Command	IAOP Review
423	4.32.2	Headquarters waiver shall be required for takeoffs from or landings on runways of lengths less than those specified in table 4-4.	Pilot in Command	IAOP Review
424	4.32.3	For normal operations, airfields shall be considered below minimums for takeoff and landing when winds, including gusts, are greater than those established in table 4-5.	Pilot in Command	IAOP Review
425	4.32.4	All flights shall be planned to have no less than the minimum fuel indicated in table 4-6 available at touchdown on the final landing.	Pilot in Command	IAOP Review
426	5.1.2	All UASs shall be operated to meet the requirements of this NPR, and appendix I defines the appropriate level of oversight for each category of UAS.	Center Director	IAOP Review
427	5.1.3	Any UAS operated on behalf of NASA that operates within the National Airspace shall be piloted by an individual who is either a NASA pilot or holds an FAA Pilot's License.	Center Director	IAOP Review
428	5.1.4	Center Directors shall establish procedures in accordance with appendices I and J to ensure that all UAS flights are properly approved and documented.	Center Director	IAOP Review
429	5.1.4	Center Directors also shall ensure that UAS flightcrews and operations receive direct oversight by the Center Flight Operations Office or through another Center with a Flight Operations Department.	Center Director	IAOP Review

430	5.2.1.3	A letter of agreement with local air facilities shall be completed to ensure that proper coordination of support requirements is understood and agreed to.	Center Director	IAOP Review
431	5.2.2	The UAS planner shall work via the Office of External Relations to gain diplomatic clearances prior to any UAS operations within their represented country.	Center Director	IAOP Review
432	5.3.5	Flight planning for routes that afford little or no time to avert the response to an erroneous data entry that could lead to a significant mishap (Class C or higher) shall have independent review both before loading in the mission computer and after upload on the UAS is complete.	Center Director	IAOP Review
433	5.3.6.2	Upon notification of an in-flight emergency, emergency procedures shall be performed by the UAS pilot in accordance with Center procedures, flight authorizations, and the UAS operations manual.	Center's Chief of Flight Operations	IAOP Review
434	5.4.1	A flight brief that includes the flightcrew, a program representative, and a maintenance representative shall be conducted prior to all flights. Briefs provide specific information in accordance with UAS SOPs. Briefs will include the following: a.) weather update; b.) program brief; c.) system update; d.) emergency divert airfields; e.) emergency procedures and terminology; f.) mission profile.	Center's Chief of Flight Operations	IAOP Review
435	5.4.2	Systems checks shall include an independent means to verify waypoints entered into a navigational system prior to takeoff.	Pilot in Command	IAOP Review

436	5.4.2.1	If a suitable runway is available, the UAS operator may perform a conventional rolling takeoff. The length of runway required depends on the UAS. If a suitable runway is not available, then an alternate launch method shall be used.	Pilot in Command	IAOP Review
437	5.4.3	The UAS recovery checklist shall be adhered to in accordance with the operations manual.	Pilot in Command	IAOP Review
438	5.5.1	UAS flightcrew members shall become qualified in accordance with written Center standards in accordance with appendix J.	Center Director	IAOP Review
439	5.5.1	Center Chiefs of Flight Operations, with the concurrence of the Center Director, shall designate UAS pilots for the specific type of UAS they operate.	Center Director	IAOP Review
440	5.5.1	The Chief of Flight Operations shall ensure that each UAS flightcrew possesses an adequate level of training and experience to perform the duties of the designated positions as laid out in appendix J.	Center's Chief of Flight Operations	IAOP Review
441	5.5.2.1e	Per appendix J, remote pilots shall meet the minimum qualifications for a NASA pilot based on this NPR and Center-established processes and procedures.	Center's Chief of Flight Operations	IAOP Review
442	5.5.2.1f	Fully qualified NASA pilots may be assigned as UAS pilots, but for UAS pilots to fly manned NASA aircraft, they shall meet NASA pilot qualification minimums.	Center Directors	IAOP Review
443	5.5.2.2	Initial UAS training shall be documented by each Center in accordance with appendix J with the approval of the Chief of Flight Operations.	Center's Chief of Flight Operations	IAOP Review

444	5.5.2.3	In the case of prototype, experimental, or research UAS aircraft for which no formal schools are available, the services of the designers and the manufacturer's best qualified personnel shall be utilized to brief and familiarize the UAS pilots with the aircraft, UAS aircraft systems, and ground control stations. In addition, existing UAS simulators and UAS aircraft of a similar nature will be used to train pilots prior to flying a UAS research vehicle.	Center's Chief of Flight Operations	IAOP Review
445	5.5.2.4	Training for all members of the UAS flightcrew shall include crew resource management training.	Center's Chief of Flight Operations	IAOP Review
446	5.5.3	NASA UAS flight time shall be kept separate from NASA manned aircraft flight time by type in NAMIS.	Center's Chief of Flight Operations	IAOP Review
447	5.5.3	A review of UAS pilot and crew qualifications shall be made prior to flight assignment to ensure that prerequisites for the intended mission are met.	Center's Chief of Flight Operations	IAOP Review
448	5.5.3	The Center's Chief of Flight Operations shall designate the crewmembers for UASs that are under the Center's purview.	Center Director	IAOP Review
449	5.6.2	The Airworthiness and Flight Safety Review Board shall participate in or, at their option, conduct reviews to establish the airworthiness and evaluate the safety of flight operations.	Center Director	IAOP Review
450	5.6.2	Other personnel who shall participate in the review include the Safety, Reliability, and Quality Assurance Office, the mission manager and/or Principal Investigator, the UAS operator, and Range Safety personnel.	Center Director	IAOP Review
451	5.6.2.1	The following topics shall be addressed by a NASA AFSRB to assess the risks associated with a UAS flight program: a.) general outline of major UASs; b.) communication links and frequency	Center Directors	IAOP Review

		management plan; c.) flight control system and configuration control procedures; d.) backup systems and procedures; e.) flight terminations systems including ground abort.		
452	5.6.3	The program/project manager shall limit the assessed collective risk associated with aerospace vehicle operation and ensure that the probability of doing harm to a member of the general public is not greater than the criteria established by NPR 8715.5, Range Safety Program.	Center Directors	IAOP Review
453	6.1.3.2	This NPR establishes policy and procedures for the NASA Aircraft Operations SMS in accordance with ICAO, Federal, and industry standards. Compliance is mandatory and shall be monitored during biennial Inter-Center Aircraft Operations Panel (IAOP) functional reviews.	Center Directors	IAOP Review
454	6.1.3.2	The SMS shall establish the mechanisms necessary to deliver and monitor safety performance. SMS is integrated into the policies and procedures throughout this document that meets the requirements of an SMS.	Chief of Safety and Mission Assurance	IAOP Review
455	6.2.2	Center Directors shall ensure that the Center ASO is granted formal access to senior management when safety issues cannot be resolved at a lower level in the flight organization.	Center Directors	IAOP Review
456	6.2.5	The Headquarters Aviation Safety Manager within the Office of Safety and Mission Assurance shall be a qualified ASO.	Chief of Safety and Mission Assurance	IAOP Review
457	6.2.5	The ASM shall provide safety and mission assurance oversight for Agency aviation activities.	Chief of Safety and Mission Assurance	IAOP Review
458	6.2.5a	The ASM shall coordinate with AD regarding OSMA requirements affecting aviation safety or reporting.	Chief of Safety and Mission Assurance	IAOP Review

459	6.2.5b	The ASM shall identify aviation safety issues through mishap investigation and analysis.	Chief of Safety and Mission Assurance	IAOP Review
460	6.2.5c	The ASM shall participate in the annual NASA ASO conference.	Chief of Safety and Mission Assurance	IAOP Review
461	6.2.5d	The ASM shall monitor the implementation of the Agency's Aviation Safety Program.	Chief of Safety and Mission Assurance	IAOP Review
462	6.2.5e	The ASM shall attend selected program flight readiness and safety reviews.	Chief of Safety and Mission Assurance	IAOP Review
463	6.2.5f	The ASM shall serve as an advisor to the IAOP and participate in IAOP activities, including meetings, reviews, and subpanel activities.	Chief of Safety and Mission Assurance	IAOP Review
464	6.2.5g	The ASM shall conduct aviation safety staff assistance visits and reviews.	Chief of Safety and Mission Assurance	IAOP Review
465	6.2.5h	The ASM shall coordinate recommendations from mishap investigations that require corrective action from sources or agencies outside of NASA.	Chief of Safety and Mission Assurance	IAOP Review
466	6.2.5i	The ASM shall participate in selected aircraft flight operations.	Chief of Safety and Mission Assurance	IAOP Review
467	6.2.7	The ASO subpanel chair is responsible for briefing safety issues and concerns of the Centers to the IAOP panel, and shall schedule and conduct subpanel meetings and teleconferences.	IAOP Aviation Safety Officer Subpanel Chair	IAOP Review
468	6.2.8	The Center's Chief of Flight Operations, with the concurrence of the Center Director, shall appoint an ASO.	Center Directors	IAOP Review
469	6.2.9a	The ASO shall hold qualification as a NASA PIC in type.	Center Directors	IAOP Review
470	6.2.9b	The ASO, within 1 year of appointment, shall complete a 2-week course in aviation safety program management.	Center Directors	IAOP Review

471	6.2.9b	Within 2 years of appointment, the ASO shall have graduated from a recognized Military Aviation/Flight Safety Officer Course or an Academic Aviation Safety Certificate Program (of at least 6 weeks' duration).	Center Directors	IAOP Review
472	6.2.10.1	Each Center shall establish a continuing education program to ensure that each ASO maintains adequate knowledge to discharge the duties of the office.	Center Directors	IAOP Review
473	6.2.10.1	To maintain familiarity with the latest aviation safety principles as a NASA ASO, the ASO shall be actively engaged in the Center's aviation operations program and complete 40 hours of continuing education in ASO course elements within 24 calendar months.	Center Directors	IAOP Review
474	6.3.1	The Center Aviation Safety Program shall be documented in a single comprehensive manual.	Center Directors	IAOP Review
475	6.3.1.1	The working group is chaired by the ASO, shall meet at least semiannually, and reports to the Chief of Flight Operations.	Center Directors	IAOP Review
476	6.3.1.2	HQ AD, together with independent oversight from the Office of Safety and Mission Assurance, shall conduct an aviation safety review of each Center biennially utilizing the IAOP Review Program.	Aircraft Division	IAOP Review
477	6.3.1.2	Centers conducting flight operations shall perform an independent flight operations review during the alternate year when an IAOP review is not scheduled.	Center Directors	IAOP Review
478	6.3.1.2	This review may be conducted by the Center Safety Office or an external aviation inspection organization and shall provide an objective evaluation of selected aircraft operations, maintenance, crew procedures, and facilities to ensure safe and efficient operation.	Center Directors	IAOP Review

479	6.3.1.3	The Center Aviation Safety Program shall establish a procedure for collecting hazards/anomalies/Close Calls data from personnel.	Center Directors	IAOP Review
480	6.3.1.3	This procedure shall document and direct hazards to the appropriate management level for investigation and resolution.	Center Directors	IAOP Review
481	6.3.1.3	Close Calls shall be documented, trended, and disseminated to internal personnel and other NASA flight organizations for educational and awareness purposes.	Center Directors	OSMA Review
482	6.3.1.3	Centers shall follow the Close Call reporting requirements contained in NPR 8621.1.	Center Directors	IAOP Review
483	6.3.1.4	The Chief of Flight Operations with the assistance of the ASO shall conduct a Government/industry-recognized cultural survey, assessment, or workshop within aircraft operations every 2 years or within 6 months of hiring a new Chief of Aircraft Operations.	Chief of Flight Operations	IAOP Review
484	6.3.1.5	ASOs shall conduct safety training for operations and maintenance personnel.	Aviation Safety Officers	IAOP Review
485	6.3.1.5	The ASO shall establish a process to ensure that topics covered are disseminated to those who could not attend.	Aviation Safety Officers	IAOP Review
486	6.3.1.6	Centers shall establish an Aviation Safety Award program.	Center Directors	IAOP Review
487	6.3.1.7	The ASO shall ensure that risk assessment and hazard analysis procedures are established. These procedures must address risks, hazards, and mitigation methods associated with aircraft modifications and research flights in accordance with chapter 2 of NPR 8715.3.	Aviation Safety Officers	IAOP Review

488	6.3.1.8	The ASO shall ensure that project and program safety plans are subject to a review process.	Aviation Safety Officers	IAOP Review
489	6.3.1.8	Once approved, the ASO shall ensure the plans are disseminated to all involved personnel.	Aviation Safety Officers	IAOP Review
490	6.3.1.9	The ASO shall ensure that aviation facilities are maintained and inspected in accordance with applicable OSHA and NASA safety standards.	Aviation Safety Officers	IAOP Review
491	6.3.1.10	The ASO shall provide safety oversight during the handling and stowage of cargo, including hazardous materials, aboard NASA aircraft.	Aviation Safety Officers	IAOP Review
492	6.3.1.11	ASOs shall ensure that aviation safety-related information is distributed throughout aircraft operations and maintenance.	Aviation Safety Officers	IAOP Review
493	6.3.1.11	Safety information that would be of interest Agency-wide shall be sent to the Office of Safety and Mission Assurance for distribution.	Aviation Safety Officers	IAOP Review
494	6.3.1.12	All NASA aircrew shall, at least once per calendar year, attend a crew resource management course of at least 4 hours in duration.	Center's Chief of Flight Operations	IAOP Review
495	6.4.1	Each Center shall publish and maintain an Aircraft/Airfield Pre-Mishap Plan in accordance with the procedures established in NPR 8621.1.	Center Directors	IAOP Review
496	6.4.1	The pre-mishap plan shall be tailored to local needs and capabilities and be developed and coordinated with all supporting and supported activities or agencies.	Center Directors	IAOP Review
497	6.4.1	The Aircraft/Airfield Pre-Mishap Plan shall be maintained for each NASA operational airfield, heliport, and aviation activity.	Center Directors	IAOP Review

498	6.4.1a	Each Center Aircraft/Airfield Pre-Mishap Plan shall ensure local fire/crash-rescue personnel are briefed annually on rescue and emergency procedures peculiar to the aircraft regularly operated at that facility and prior to operation of newly acquired aircraft.	Center Directors	IAOP Review
499	6.4.1b	Each Center Aircraft/Airfield Pre-Mishap Plan shall ensure that mock mishap drills are held and that the ASO evaluates the results to ensure optimal coordination with pre-mishap plans.	Center Directors	IAOP Review
500	6.4.1c	Each Center Aircraft/Airfield Pre-Mishap Plan shall address procedures for aircraft mishaps away from home field.	Center Directors	IAOP Review
501	6.4.1d	Each Center Aircraft/Airfield Pre-Mishap Plan shall establish procedures for notifying and working with the National Transportation Safety Board and the FAA for aircraft accidents reportable under Federal regulations.	Center's Chief of Flight Operations	IAOP Review
502	7.2.1	Pilots shall hold an FAA First Class medical certificate, military pilot flight physical, or NASA flight medical certification renewed annually or more frequently if specified by the Center Director or a competent medical authority.	Center's Chief of Flight Operations	IAOP Review
503	7.2.1.1	Flightcrew of high performance jet aircraft or ejection seat configured aircraft shall obtain a military pilot flight physical or NASA flight medical certification.	Center's Chief of Flight Operations	IAOP Review
504	7.2.1.2	Pilots 55 years of age and older shall be medically certified every 6 months.	Center's Chief of Flight Operations	IAOP Review
505	7.2.2	Flight Engineers shall hold either an FAA Second Class medical certificate, military flight physical, or NASA flight medical certification, which must be renewed annually or earlier if specified	Center's Chief of Flight Operations	IAOP Review

		by a competent medical authority.		
506	7.2.3	Other primary aircrew shall hold either an FAA Third Class medical certificate, military flight physical, or NASA flight medical certification, which must be renewed annually or earlier if specified by a competent medical authority.	Center's Chief of Flight Operations	IAOP Review
507	7.2.4	Qualified non-crewmembers shall obtain medical clearances as required by Center procedures. At a minimum, a medical screening must be conducted by a NASA physician as appropriate for the mission.	Center's Chief of Flight Operations	IAOP Review
508	7.2.5	Center Directors shall establish procedures, in coordination with their personnel offices, to ensure that primary aircrews are assigned to duties not involving flying if they become medically disqualified.	Center Directors	IAOP Review
509	7.3.1	Copies of current medical certification shall be kept on file at the primary aircrew and qualified non-crewmembers' operating site.	Center's Chief of Flight Operations	IAOP Review
510	7.5.1	Flightcrews shall report Special Issuances (FAA Waivers) and FAA Statements of Demonstrated Ability to the Chief of Flight Operations for review by a NASA Aeromedical Physician.	Center's Chief of Flight Operations	IAOP Review
511	8.1	Center Aircraft Flight Operations organizations shall coordinate all aircraft acquisition and disposition actions with the cognizant Center Supply and Equipment Management Officer(s) in accordance with NPR 4200.1, NASA Equipment Management Procedural Requirements.	Center Directors	IAOP Review
512	8.1	In addition, transfer of aircraft between Federal agencies and disposal of aircraft, including exchange/sales by Federal agencies, shall be authorized by GSA.	Center Directors	GSA Review

513	8.2.1	Prior to acquiring aircraft for operational use, the Associate Administrator of the Mission Directorate or the Center Director shall submit an acquisition request to the HQ AD per appendix H, along with a business case analysis in support of the aircraft acquisition.	Center Directors	IAOP Review
514	8.2.1	Procurement of aircraft shall be conducted in accordance with established Federal Acquisition Regulations and guidelines, including OMB Circulars A-76 and A-126, and initiated only after approval from the Assistant Administrator for the Office of Strategic Infrastructure and after the following alternatives have been considered in the following order: <ul style="list-style-type: none"> a. Use of available NASA aircraft resources. b. Use of public aircraft owned by other Government agencies through loan or transfer. c. Charter or lease of civil aircraft. 	Center Directors and Mission Directorates	IAOP Review
515	8.2.2	In completing appendix H, the program/project manager shall coordinate with the Center Environmental Management Office to determine whether the proposed aircraft acquisition requires preparation of an environmental assessment.	Center Directors	IAOP Review
516	8.2.4	Mission Directorates establish the requirements and funding level for each aircraft assigned to support their programs and shall approve the program/project managers' acquisition requests prior to submission to the HQ AD	Mission Directorates	Concurrent Clearance Process
517	8.2.5	AD shall enter all acquired aircraft into FAIRS.	Aircraft Division	IAOP Review
518	8.2.6	Centers shall record all acquired aircraft in the NASA Equipment Management System in accordance with NPR 4200.1.	Center Directors	IAOP Review

519	8.2.6	Centers shall register all aircraft, excluding parts and DoD-loaned aircraft, with the FAA.	Center Directors	IAOP Review
520	8.3.1	The program/project manager or Center Director shall notify the HQ AD prior to acquisition of an aircraft whose intended use is solely for "parts aircraft."	Center Directors	IAOP Review
521	8.3.1a	Centers shall remove the data plates from all aircraft acquired solely for parts purposes and forward the data plates to HQ AD for disposition.	Center Directors	IAOP Review
522	8.3.1b	Centers shall enter parts aircraft into each respective Center's property inventory records in accordance with NPR 4200.1.	Center Directors	IAOP Review
523	8.3.2	Aircraft materiel, such as spare parts, shall be acquired, managed, and controlled in compliance with NPR 4100.1 and 41 CFR 102-33, Management of Government Aircraft.	Center Directors	IAOP Review
524	8.3.3.1	For as long as FSCAP or Life Limited Parts are used or kept by NASA, the documentation that accompanies those parts shall be maintained and kept updated.	Center Directors	IAOP Review
525	8.3.3.2	When FSCAP and Life Limited Parts are disposed, the up-to-date documentation shall accompany the parts.	Center Directors	IAOP Review
526	8.3.3.3	The Criticality Code of a FSCAP shall be maintained and perpetuated on all property records and reports of excess.	Center Directors	IAOP Review
527	8.4.1	A NASA owned aircraft shall be disposed of when it is excess to the current and anticipated needs of the Agency.	Center Directors	
528	8.4.1.	Disposal of NASA-owned aircraft shall be in accordance with Federal Property Management Regulations and the applicable portions of NPD 4300.1, NASA Personal Property Disposal Policy, and NPR 4300.1, NASA	Center Directors	IAOP Review

		Personal Property Disposal Procedural Requirements.		
529	8.4.1	Disposal of NASA aircraft identified as artifacts or heritage assets shall be in accordance with NPR 4310.1, Identification and Disposition of NASA Artifacts.	Center Directors	IAOP Review
530	8.4.1	Aircraft disposition shall be coordinated in advance with the HQ AD and approved by the Assistant Administrator for the Office of Strategic Infrastructure.	Center Directors	IAOP Review
531	8.4.1.1	External loan agreements shall be reviewed by the Center Chief Counsel, other Center officials as appropriate, and approved by the Center Supply and Equipment Management Officer (SEMO) in accordance with NPR 4200.1, Sections 3.3.2, 3.3.3, and 3.4	Center Directors	IAOP Review
532	8.4.1.1	Aircraft loaned externally by NASA for display, even when done as part of NASA Exhibits Program, shall be accompanied by a loan agreement signed by the Center SEMO.	Center Directors	IAOP Review
533	8.4.1.2	Requests accompanied by written justifications for deviation from the prohibition shall be coordinated through the NASA AD and the NASA Property Disposal Officer (PDO)	Center Directors	IAOP Review
534	8.4.1.2e	When an aircraft that has an FAA Certificate of Airworthiness is removed from the inventory, the Certificate shall be removed from the aircraft and forwarded to the HQ AD for disposition unless the aircraft is transferred to another Government agency that intends to operate it or it is sold through GSA to a civil operator.	Center Directors	IAOP Review
535	8.4.2	When an aircraft is removed from the inventory that is not capable of obtaining an FAA Certificate of Airworthiness or is deemed by the Center Flight Operations Office to be unsafe for civil use, the manufacturer's data plate shall	Center Directors	IAOP Review

		be removed and forwarded to the HQ AD for disposition.		
536	8.5.1	In accordance with Chapter 2 of NPR 4200.1, Centers shall conduct annual physical inventories of Center-owned aircraft, including display aircraft, parts aircraft, and aircraft in flyable or non-flyable storage, to determine the accuracy of the records and the NEMS control system.	Center Directors	IAOP Review
537	9.1.1	Results of the reviews shall be used to update NASA-wide or local requirements in order to enhance standardization and improve productivity.	Center Directors	IAOP Review
538	9.2.1	The HQ AD shall establish inter-Center review teams to review all aspects of flight operations at NASA Centers, including the implementation of Center procedures, either biennially or as determined by the HQ AD.	AD	IAOP Review
539	9.3.1.4	The entrance briefing given by the Center to the review team shall be comprehensive. Local operations and maintenance documents will be made available to the team, and the team members will familiarize themselves with the documents before performing field work.	IAOP Review Team Leader	IAOP Review
540	9.3.2	Instructions for reviewers shall ensure compliance with established standards, including FAA, DoD, manufacturer, industry, and association standards.	IAOP Review Team Leader	IAOP Review
541	9.3.3	The team leader shall hold daily team progress meetings to discuss discrepancies and recommendations.	IAOP Review Team Leader	IAOP Review
542	9.3.4	The team leader's exit briefing shall be in sufficient detail to inform Center management of the status of local Flight Operations activities with particular emphasis on significant findings and recommendations requiring management attention.	IAOP Review Team Leader	IAOP Review

543	9.3.5	The review team shall document results in a brief report that focuses on significant findings and recommendations.	IAOP Review Team Leader	IAOP Review
544	9.3.5	The report shall be forwarded by the review team leader to the Assistant Administrator for the Office of Strategic Infrastructure with a copy to the Center Director.	IAOP Review Team Leader	IAOP Review
545	9.3.6	The Center Director shall respond to the Assistant Administrator for the Office of Strategic Infrastructure concerning corrective actions.	Center Directors	IAOP Review
546	11.3.1	Centers shall use the NASA Aircraft Cost and Performance worksheets in appendix G to report aircraft data to HQ AD within 45 days after the end of each quarter.	Center Directors	IAOP Review
547	11.3.1.1	Centers shall use the Aviation Inventory Report worksheet in appendix G to report the number and type of aircraft operated.	Center Directors	IAOP Review
548	11.3.1.2	The Centers shall use the Aviation Performance Report worksheet in appendix G to report aircraft operational data, unless an Agency-wide aircraft operations data reporting system is utilized.	Center Directors	IAOP Review
549	11.3.1.3	The Centers shall use the Aviation Safety Report worksheet in appendix G to report aircraft operational safety metrics, unless an Agency-wide aviation safety reporting system is utilized.	Center Directors	IAOP Review
550	11.3.1.4	The Centers shall use the Aviation Financial Report worksheet in appendix G to report aircraft costs, including contracted CAS.	Center Directors	IAOP Review
551	11.3.1.4a	Center CFOs shall implement actions to correct any financial errors uncovered in the Business Warehouse.	Center Chief Financial Officer	IAOP Review

552	12.2.1	To be eligible to be assigned to flight status, aircrew members shall meet all applicable requirements of chapters 3 and 4, any additional Center requirements, and will be assigned as either a: GS-2181, Aircraft Operations Series, OR b. GS-0861, Aerospace Engineering Series, OR c. Meet the applicable series and grade requirements of the OPM qualification standard for a GS-2181, Aircraft Operations Series in addition to the requirements laid out in chapters 3 and 4 of this NPR. Any waivers within this OPM qualification standard shall be approved only by the Assistant Administrator for the Office of Strategic Infrastructure.	Center Directors	IAOP Review
553	12.2.3	Each Center Director and Chief of Flight Operations, in close coordination with the Center Human Resources Office, shall establish a process to designate pilots and aircrew.	Center Directors	IAOP Review
554	12.2.3	To qualify for assignment as a NASA pilot of manned aircraft, only manned aircraft time shall apply.	Center Directors	IAOP Review
555	12.2.4	Each Center's Chief of Flight Operations shall establish procedures for assignment of aircrew to flight status and document those procedures in the Center Aviation Operations Manual.	Center's Chief of Flight Operations	IAOP Review
556	12.2.4	Fully qualified NASA pilots may be assigned as UAS pilots, but for UAS pilots to fly manned NASA aircraft, they shall meet NASA pilot qualification minimums.	Center's Chief of Flight Operations	IAOP Review
557	12.3.1	Each Center's Chief of Flight Operations shall establish procedures for temporary removal of aircrew personnel from flight status for situations other than medical disqualification.	Center's Chief of Flight Operations	IAOP Review

558	12.3.1	The Center Director, in accordance with Human Resources procedures, shall review and approve any non-medical-related proposal for removal from flight status in excess of 30 days.	Center Directors	IAOP Review
559	12.3.4	If the reason for removing the individual from flight status is an event that is properly classifiable as a Close Call pursuant to NPR 8621.1, the process for investigation described therein shall be followed.	Center Directors	IAOP Review
560	12.3.5.2	If a Flight Performance Board is convened, a flight status recommendation shall be delivered to the Center Director.	Center's Chief of Flight Operations	IAOP Review
561	13.1.1	A Center shall not operate an airfield (or helicopter landing area) unless the Center adopts and complies with an Airfield Operations Manual in accordance with section 13.2 of this NPR.	Center Directors	IAOP Review
562	13.1.2	Each Center operating an airfield shall ensure that the FAA Regional Airports Division Manager is provided a complete copy of the Center's most current Airfield Operations Manual.	Center Directors	IAOP Review
563	13.1.3	Centers providing access to their airfield to the general public for aircraft operations conducted under civil regulations shall identify all deviations and non-compliance from 14 C.F.R. 139 and provide this information to the Office of Strategic Infrastructure for approval.	Center Directors	IAOP Review
564	13.1.4a	Each Center shall develop and maintain an airfield emergency plan designed to minimize the possibility and extent of personal injury and property damage on the airfield in an emergency.	Center Directors	IAOP Review

565	13.1.4b	Each Center shall coordinate the plan with law enforcement agencies, rescue and firefighting agencies, medical personnel and organizations, the principal tenants at the airfield, and all other persons who have responsibilities under the plan.	Center Directors	IAOP Review
566	13.1.4c	At least once every 12 consecutive calendar months, the plan shall be reviewed with all the parties with whom the plan is coordinated, as specified in this NPR, to ensure that all parties know their responsibilities and to ensure that all information in the plan is current.	Center Directors	IAOP Review
567s	13.1.4d	Each Center shall hold a full-scale airfield emergency plan exercise at least once every 24 consecutive calendar months.	Center Directors	IAOP Review
568	13.1.5	Centers shall conduct training needed to meet the following requirements: a.) providing sufficient and qualified personnel to comply with the requirements of this NPR; b.) equipping personnel with sufficient resources to comply with the requirements of this NPR; c.) training all personnel who access movement areas and safety areas and perform duties in compliance with the requirements of the Airfield Operations Manual and the requirements of this NPR.	Center Directors	IAOP Review
569	13.1.6	All NASA Centers operating airfields or aircraft ramp areas shall conduct a Pavement Condition Index survey at least once every 5 years.	Center Directors	IAOP Review
570	13.1.7	Airfield condition reporting shall be conducted in a manner authorized by the Center Director and meet the following requirements: a.) provide for the collection and dissemination of airfield condition information to aircraft operators including alerts on bird and other wildlife activity; b.) use the Notices to Airmen (NOTAM) system, as	Center Directors	IAOP Review

		<p>appropriate, and other systems and procedures authorized by the FAA; c) provide information on the following airfield conditions that may affect the safe operations of aircraft: (1) construction or maintenance activity on movement areas, safety areas, or loading ramps and parking areas; (2) surface irregularities on movement areas, safety areas, or loading ramps and parking areas; (3) snow, ice, slush, or water on the movement area or loading ramps and parking areas; (4) snow piled or drifted on or near movement areas; (5) objects on the movement area or safety areas; (6) malfunction of any lighting system, holding position signs, or Instrument Landing System (ILS) critical area signs; (7) unresolved wildlife hazards; (8) Non-availability of any rescue and firefighting capability required; (9) Any other condition specified in the Airfield Certification Manual or that may otherwise adversely affect the safe operation of aircraft; (10) procedures for identifying, marking, and lighting construction and other unserviceable areas; (11) any other item that the Center Director finds is necessary to ensure safety in airfield operations.</p>		
571	13.2.1	Each Center shall maintain an Airfield Operations Manual that includes descriptions of operating procedures, facilities and equipment, responsibility assignments, and any other information needed by personnel concerned with operating the airfield.	Center Directors	IAOP Review
572	13.2.2	Each Center shall include in the Airfield Operations Manual the following elements: a.) Lines of succession of airfield operational responsibility; b.) copies of current waivers, variances, or deviations issued to the airfield; c.) any limitations imposed by the Administrator; d.) a grid map or other means of identifying locations and	Center Directors	IAOP Review

terrain features on and around the airfield that are significant to emergency operations; e.) the location of each obstruction within the airfield's area of authority required to be lighted or marked; f.) a description of all movement areas available for civil and public aircraft operators and the airfield's safety areas, and all roads that serve them; g.) procedures for avoidance of interruption or failure during construction work of utilities that serve facilities or NAVAIDS that support aircraft operations; h.) a description of airfield personnel training detailed in section 13.1.5; i.) procedures for maintaining paved areas; j.) procedures for maintaining unpaved areas; k.) procedures for maintaining safety areas; l.) a plan showing the runway and taxiway identification system, including the location and inscription of signs, runway markings, and holding position markings; m.) a description of marking, signs, and lighting systems, and procedures for maintaining them; n.) a snow and ice control plan. Prompt notification will be given to all aircraft operators using the airfield when any portion of the movement area is less than satisfactorily cleared for safe operation of their aircraft; o.) a description of the facilities, equipment, personnel, and procedures for meeting the aircraft rescue and firefighting requirements detailed in section 13.3; p.) procedures for protecting persons and property during storing, dispensing, and handling fuel or other hazardous substances and materials; q.) a description of traffic and wind direction indicators and procedures for maintaining them; r.) the Pre-Mishap Plan/Aircraft Incident Response Plan as specified in section 13.1.4; s.) procedures for conducting a biennial self-inspection program; t.) procedures for controlling pedestrians and ground

		vehicles in movement areas and safety areas; u.) procedures for obstruction removal, marking, or lighting; v.) procedures for protection of NAVAIDS; w.) a description of public protection; x.) procedures for wildlife hazard management as specified in section 13.4; y.) airfield condition reporting procedures as specified in section 13.1.6.		
573	13.3.1.1	Each Center shall provide on the airfield, during aircraft operations at the airfield, at least the rescue and firefighting capability specified for the level of operations.	Airfield Manager	IAOP Review
574	13.3.1.2	In the event that fire protection is temporarily not available due to lack of personnel, equipment, or other emergencies, the Center shall establish procedures to restrict the use of the airfield and notify aircraft operators of the temporary suspension of airfield operations.	Center Director	IAOP Review
575	13.3.1.3	All rescue and firefighting personnel shall participate in at least one live-fire drill prior to initial performance of rescue and firefighting duties and every 12 consecutive calendar months thereafter.	Airfield Manager	IAOP Review
576	13.4.1	Each Center shall take immediate action to eliminate wildlife hazards whenever they are detected.	Airfield Manager	IAOP Review
577	13.4.2	Each Center shall ensure that a wildlife hazard assessment is conducted by a wildlife damage management biologist who has professional training and/or experience in wildlife hazard management at airfields or an individual working under direct supervision of such an individual.	Airfield Manager	IAOP Review

578	13.4.3	Each Center shall conduct a training program by a qualified wildlife damage management biologist to provide airfield personnel with the knowledge and skills needed to successfully carry out the wildlife hazard management plan required by this chapter.	Airfield Manager	IAOP Review
579	13.4.4	Each Center shall track and report all bird strikes and other wildlife strikes either in the Incident Reporting Information System or the NASA Aircraft Anomaly Reporting System in accordance with NPR 8621.1.	Airfield Manager	IAOP Review
580	13.4.5	Each Center shall conduct a periodic review of the bird hazard using a team similar to the U.S. Air Force Bird/Wildlife Aircraft Strike Hazard team.	Airfield Manager	IAOP Review
581	13.4.6	Each Center shall develop a wildlife hazard management plan using the wildlife hazard assessment as a basis.	Airfield Manager	IAOP Review
582	13.5.1	Unless otherwise authorized by the Center Director or the FAA (in the case of civil aircraft operations), whenever the requirements of this NPR cannot be met to the extent that uncorrected, unsafe conditions exist on the airfield, the Center shall limit aircraft operations to those portions of the airfield not rendered unsafe by those conditions.	Center Directors	IAOP Review
583	13.6.1	Each Center that deviates from a requirement under this section shall, within 14 days after the emergency, notify HQ AD of the nature, extent, and duration of the deviation.	Center Directors	IAOP Review