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# NASA Procedural Requirements

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## Subject: Aircraft Operations Management Manual

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## 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]

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