



Subject: Safety and Mission Assurance (SMA) Audits, Reviews, and Assessments

Responsible Office: Office of Safety and Mission Assurance (OSMA)

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P.0 NID Rationale

- a. OSMA developed a significant revision to NPR 8705.6, Safety and Mission Assurance (SMA) Audits, Reviews, and Assessments. Main reason for the revision was to better align the requirements with a new audits and assessments philosophy to make Center organizations more responsible for assessing their own state of SMA requirement conformance. This included the rewrite of Chapter 3 (previously Chapter 2) to update to the current OSMA assessment and audit processes (removed IFOSA and QAAR; added AIO Assessments, AIO Safety Audits, and Independent Assessments; included specific requirements on Center organizations for assessing their own conformance to SMA requirements; added requirement for Centers to provide results of internal and third-party audits and assessments). In addition, this revision, restructured the document, eliminated references to canceled NPD 1210.2, incorporated additional authority documents, and updated the definitions in Appendix A.
- b. This significant revision has gone through a complete review cycle, including an Agency-wide NODIS review. However, given an ongoing review of NASA's operating model based on a recent executive order, this revision is released as a NASA interim directive (NID). This will remove outdated direction in NPR 8705.6D while acknowledging that audit and assessment requirements could further change soon.

Preface

P.1 Purpose

- a. This directive establishes requirements for conducting reviews, assessments, and audits to ensure the incorporation and fulfillment of SMA policy direction and assessing and advancing the effectiveness of SMA policy direction, activities, processes, and safety culture to address institutional and programmatic risk to safety and mission success as required by NPD 1000.3, The NASA Organization, and NPD 8700.1, NASA Policy for Safety and Mission Success.

P.2 Applicability

- a. This directive is applicable to NASA Headquarters and NASA Centers, including Component Facilities and Technical and Service Support Centers. This language applies to the Jet Propulsion Laboratory (JPL) (a Federally-Funded Research and Development Center) as specified in the contract.
- b. This directive applies to any NASA program, project, institution, or facility that is responsible for the application or implementation of SMA requirements.
- c. In this directive, all mandatory actions (i.e., requirements) are denoted by statements containing the term "shall." The terms "may" denotes a discretionary privilege or permission, "can" denotes statements of possibility or capability, "should" denotes a good practice and is recommended, but not required, "will" denotes expected outcome, and "are/is" denotes descriptive material.
- d. In this directive, all document citations are assumed to be the latest version unless otherwise noted.

P.3 Authority

- a. NPD 8700.1, NASA Policy for Safety and Mission Success.

P.4 Applicable Documents and Forms

None.

P.5 Measurement/Verification

Compliance with the requirements contained in this directive is monitored by the Center Institutional Safety Authority/Safety and Mission Assurance Technical Authority (TA) and by the NASA Office of Safety and Mission Assurance. Compliance may also be verified by assessments, reviews, and audits of the requirements and processes defined within this directive.

P.6 Cancellation

None.

Chapter 1. Introduction

1.1 Guiding Policy and Implementation Approach

1.1.1 NPD 8700.1 states that it is NASA policy to assess the effectiveness of safety practices and manage related risks at all levels of the Agency. In addition, the NPD states that it is NASA policy to cultivate a robust safety culture that values and pursues technical and organizational excellence in order to understand and reduce risk.

1.1.2 The Centers have primary responsibility for assessing and assuring the effectiveness of the Center's SMA practices and the robustness of its safety culture. This includes the evaluation of compliance with relevant statutes, policies, and standards, and more broadly the health of the SMA programs and capabilities, collectively referred to as SMA functions.

1.1.3 On a periodic basis, the Chief, SMA may request Centers to provide information regarding the state of their SMA functions via a structured approach with defined evaluation criteria. The information is used by the Chief, SMA as a basis to establish reasonable assurance that SMA functions across NASA are effective and to identify common areas of concern requiring Agency-level corrective action.

Note: This is in contrast to an approach in which the Chief, SMA primarily relies on periodic, broad compliance audits to obtain such information.

1.1.4 This NPD does not define the specifics of the structured approach. Rather, the format and frequency of reports will be coordinated with Centers via the Safety and Mission Assurance Management Board (SMAMB) chartered under the authority of, and chaired by, the Chief, SMA. SMAMB membership includes the Center SMA Directors.

Note: The format and frequency of reports will be coordinated with Centers via the Safety and Mission Assurance Management Board (SMAMB) chartered under the authority of, and chaired by, the Chief, SMA. SMAMB membership includes the Center SMA Directors.

1.1.5 The Chief, SMA may conduct targeted independent assessments or audits to supplement the Center reports. The Chief, SMA should consult with the SMAMB regarding the priorities of such independent assessments and audits to ensure that those priorities are risk-informed. This does not limit the Chief, SMA's responsibilities and authorities related to TA, Institutional Safety Authority, and related oversight activities defined in other NPRs.

1.2 Safety Culture

1.2.1 Safety culture is the part of safety and health management systems concerned with the way safety is perceived, valued, and prioritized in organizations.

1.2.2 NASA developed the Agency's Five Factor Safety Culture Model to standardize the understanding, expectations, and measurement of NASA's safety culture. Standardization helps establish a common language to discuss safety culture issues and concerns. More details on this program can be found in the NASA-HDBK-8709.24, NASA Safety Culture Handbook, and

Orientation to NASA Safety Culture (SATERN Course HQ-SMA-ONSC), and Safety Culture for Supervisors (SATERN Course HQ-SMA-SCS). Routine feedback from the workforce is a fundamental tenet of developing and maintaining a healthy safety culture. Feedback should be obtained, analyzed, and shared on a regular basis to monitor and improve how the Agency prioritizes, values, and perceives safety.

1.2.3 The objective of the Safety Culture Survey required by this NPR is for personnel at all NASA Centers and organizations, including NASA HQ, to provide feedback regarding their safety culture at the Organizational, Directorate, Center, and Agency levels. For this purpose, a uniform survey, coordinated by OSMA, is periodically conducted across the Agency.

Chapter 2. Roles and Responsibilities

2.1 OSMA Chief, Safety and Mission Assurance

2.1.1 The OSMA Chief, Safety and Mission Assurance is responsible for:

- a. Maintaining a coordinated, in-depth system of tools and processes to establish reasonable assurance of the effectiveness of safety and mission assurance functions across NASA.
- b. Supporting, through advocacy, tools, processes, analysis and advice, the cultivation of a robust safety culture across the Agency.

2.2 Center Directors

2.2.1 Center Directors are responsible for assessing and assuring the effectiveness of safety and mission assurance functions and state of the safety culture at their Center and ensuring results of assessments are used to improve the Center's safety practices and culture.

Note: As defined in NPD 8700.1, Center SMA Director (or equivalent principal SMA official) assist Center Directors with the implementation of these responsibilities and maintain a communication line to the Chief, SMA.

Chapter 3. Procedural Requirements

3.1 Agency-level Assurance of Safety and Mission Assurance Functions

3.1.1 The Chief, SMA, in coordination with the SMAMB, shall establish and implement a plan for the assurance of the effectiveness of safety and mission assurance functions across the Agency consistent with the guiding policy and approach defined in Chapter 1 of this NPR.

3.1.2 Center Directors should plan and implement a program of activities (e.g., audits, assessments, reviews) to verify Center compliance with safety-related statutes, policies, and standards, to assess the effectiveness of SMA functions at their Centers, and to ensure the implementation of effective corrective actions within the institution and programs/projects managed by the Center. Specific requirements to conduct such activities may be defined by statute and in other NPRs.

3.1.3 Centers may request external assessments by OSMA to support Center-level compliance verification activities.

3.2 Safety Culture Surveys

3.2.1 Center Directors shall conduct safety culture surveys (SCS) at their Centers using an Agency-wide survey tool and in accordance with an Agency survey cycle schedule approved by the SMAMB based on a recommendation by the Safety Culture Working Group.

3.2.2 The Agency survey cycle schedule includes a survey period and targeted date for delivery of results to Agency leadership. Surveys nominally take place every two (2) years, scheduled to ensure the availability of current data to Agency leadership. The SMAMB may adjust this frequency on a case-by-case basis.

Note: Consider conducting a safety survey when there is a change in Center leadership to better inform the incoming Director on the state of the culture at the time they take over.

3.2.3 Center SMA Directors shall compile and inform the Center Director and OSMA of SCS results and related recommendations nominally within a 90-day period of survey closeout (i.e., when the Center stops accepting survey input).

3.2.4 The 90-day period allows the SMA personnel time to compile the data and organize it for presentation to ensure their Center Director and leadership are aware, informed, and understand the results in a timely manner such that there is ample time to develop and execute corrective actions prior to the next survey cycle. Center Directors may extend the 90-day period if needed as long as Center results are provided to OSMA no later than 30-days prior to the targeted date for delivery of results to Agency leadership.

3.2.5 The Chief, SMA shall compile and inform Agency leadership of Agency-level SCS results nominally within a 120-day period of the closeout of the last survey in the survey cycle.

3.2.6 Center Directors and the Chief, SMA, in consultation with Office of the Chief Human Capital Officer and Office of Equal Opportunity, should disseminate SCS results to Center and Agency stakeholders.

Chapter 4. Guidance for the Implementation of Safety and Mission Success Reviews

4.1 Overview

4.1.1 The Safety and Mission Success Review (SMSR) is a pre-decisional review held to prepare Agency safety, engineering, and health and medical management to participate in program final readiness reviews preceding launches and significant flight activities, including experimental and test launch vehicles, sample return capsules, or other reviews as determined by the heads of NASA's TAs. The SMSR provides the knowledge, visibility, and understanding necessary for senior safety, engineering, and health and medical management to either concur or non-concur in upcoming program decisions to proceed with a launch or significant flight activity.

4.1.2 SMSRs can be Agency-led or Center-led. Agency-led SMSRs are conducted for any activity requiring Mission Directorate-level or higher-level decision to proceed. Center-led SMSRs, hereafter referred to as Safety and Mission Success Assessments (SMSA), are conducted for any activity requiring lower than a Mission Directorate-level decision to proceed. SMSAs are led by Center safety management as the delegated SMA TA. Decisions normally meeting the criteria for a SMSR may be delegated to a SMSA with the approval of NASA's TAs.

4.1.3 The Chief, SMA, the Chief Engineer, or the Chief Health and Medical Officer, as the heads of NASA's TAs, are the co-chairs of the SMSR. Any TA may request a SMSR or SMSA for other safety and mission success-critical program or project activities to ensure all risks are mitigated to an acceptable level, including:

- a. Test readiness reviews, design certification reviews, and extravehicular activities.
- b. Reviews of tailoring or nonconformity of program and project SMA, engineering, or health and medical requirements that may affect mission success or facility operations.

4.2 Purpose of a Safety and Mission Success Review

4.2.1 The purpose of a SMSR is:

- a. Examine mission preparation status, open work issues, and concerns, including protection of the public and environment (e.g., orbital debris mitigation, planetary protection, range flight safety and nuclear flight safety).
- b. Assess overall system readiness.
- c. Review and affirm the results of assurance processes and requirements that have been implemented over the life of the Program.
- d. Verify compliance with the applicable requirements, including any information as required in NPR 8705.4, Risk Classification for NASA Payloads.
- e. Provide adequate knowledge and visibility for NASA's TAs to understand the risks associated with the safety and mission success of Program launches, operational stages, mishap preparedness, and selected critical tests, utilizing input from cognizant Program and Center-

based safety and reliability review panels (e.g., ground safety, payload safety), thus preparing each TA to proceed to final readiness reviews.

4.3 Determination of Safety and Mission Success Review Requirement

4.3.1 SMSRs are intended to precede launches and significant flight activities, including experimental and test launch vehicles, sample return capsules, or other activities as determined by cognizant officials. A SMSR is generally required until determined otherwise.

4.3.2 The determination of the requirement for a SMSR is ultimately the decision of the applicable TAs, with recommendation from the SMSR Program Executive. The determination should be made in conjunction with Program/project management and cognizant TA professionals.

4.3.3 The following items should be considered with respect to whether a SMSR is required:

- a. Uniqueness of the mission objectives.
- b. Initial use of or significant change in critical systems.
- c. Human spaceflight activities, and whether they involve NASA astronauts, commercial astronauts, or international partners.
- d. Significant residual risk.
- e. NASA level of involvement in commercial missions.

Appendix A. Definitions

Assessment. An activity that uses a set of concepts and principles, not a standard, to evaluate the accuracy, efficiency and/or effectiveness of an entity.

Audit. A formal evaluation of compliance with SMA policies, procedures, processes, requirements, specifications, baselines, standards, instructions, codes, and contractual and licensing requirements.

Independent Assessment. An assessment of operations, processes, products, and requirements related to human spaceflight by relevant Centers to identify and/or address areas for improvement and support risk-based decision making.

Review. An activity that proposes to figure out how well the thing being reviewed is capable of achieving established objectives. Reviews ask the following question: is the subject (or object) of the review a suitable, adequate, effective, and efficient way of achieving established objectives.

Safety Culture. The value placed on safety as demonstrated by people's behavior. It is the way safety is perceived, valued, and prioritized in an organization. It reflects the commitment to safety at all levels in the organization. It is "how an organization behaves when no one is watching." Safety culture is expressed and observed via individual and group attitudes and behaviors and organizational processes.

Appendix B. Acronyms

JPL	Jet Propulsion Laboratory (a Federally Funded Research and Development Center)
OSMA	Office of Safety and Mission Assurance
SCS	Safety Culture Survey
SMA	Safety and Mission Assurance
SMAMB	Safety and Mission Assurance Management Board
SMSA	Safety and Mission Success Assessment
SMSR	Safety and Mission Success Review
TA	Technical Authority

Appendix C. Reference Documents

C.1 NPD 1000.3, The NASA Organization,

C.2 NPD 1200.1, NASA Internal Control.

C.3 NPD 1440.6, NASA Records Management.

C.4 NPR 1400.1, NASA Directives and Charters Procedural Requirements.

C.5 NPR 8705.4, Risk Classification for NASA Payloads.

C.6 NASA-HDBK-8709.22, Safety and Mission Assurance Acronyms, Abbreviations, and Definitions.

C.7 NASA-HDBK-8709.24, NASA Safety Culture Handbook.