

BASELINE



Institutional/Facility/ Operational (IFO) Safety and Mission Assurance (SMA) Audit Program Requirements

_____/s/
Bryan O'Connor
Chief Safety and Mission Assurance

January 17, 2006
Date

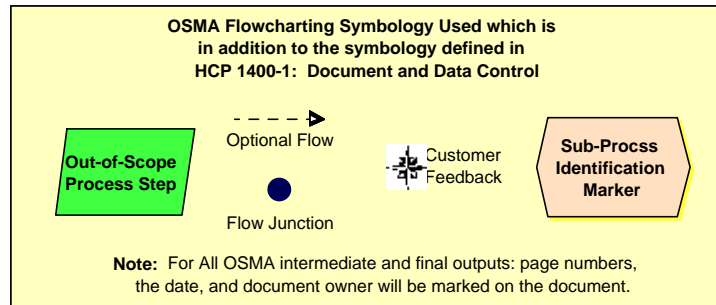
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1. Purpose

The purpose of this Office of Safety and Mission Assurance (OSMA) Headquarters Office Work Instruction (HOWI) is to define the requirements and processes for conducting the OSMA Institutional/Facility/Operational (IFO) Safety and Mission Assurance (SMA) Audits of the NASA Centers to meet NPD 8700.1, “*NASA Policy for Safety and Mission Success.*” This HOWI does not address the OSMA Programmatic Safety Audits.

The purpose of IFO SMA Audits is to verify NASA Center compliance with institutional, facility, and operational SMA requirements. These audits will verify the flow-down of pertinent Agencywide SMA directives, policies, and requirements from NASA Headquarters into NASA Center requirements and procedures, and assess whether NASA Centers’ practices reflect their procedures and processes. The results of the audits will provide NASA Center Management with an independent, objective, and constructive evaluation of the effectiveness and efficiency with which SMA responsibilities and requirements are being implemented.

2. Scope and Applicability

This OSMA HOWI is applicable to all members of the OSMA staff involved with IFO SMA Auditing. This HOWI provides the basic requirements of the OSMA IFO SMA Audit process. IFO SMA Audits focus on compliance verification with SMA requirements contained in references 4.1 through 4.28 and are grouped into the following 6 Focus Areas:

- a. Public/Worker Safety: SMA Personnel Certification for Hazardous Operations, NASA Safety Manual, and Personnel Safety and Health Requirements,
- b. Facility System Safety: Facility Safety, Fire Protection, and Underwater Facility for Non-Open Water Operations Safety Requirements,
- c. Mishap Investigation,
- d. Equipment Safety: Metrology and Calibration, Lifting Devices and Equipment, and Pressure Vessels and Systems, and Government-Industry Data Exchange Program (GIDEP) Alerts,
- e. Explosives and Hazardous Materials Safety,
- f. Range Safety,
- g. Electrical Safety.

3. Definitions

- 3.1 Audit Announcement Letter: Correspondence issued by the Chief Safety and Mission Assurance, with support by the IFO SMA Audit Manager, to the NASA Center Director and SMA Director that contains details on the scope and duration of the OSMA IFO SMA Audit and any actions that the NASA Center Director and SMA Director are requested to take in preparation for the Audit and to support the Audit Team during the Audit.
- 3.2 Audit Coordinator: Member of the Audit Team that assists the Audit Team Leader in the coordination and administration of the OSMA IFO SMA Audit.
- 3.3 Audit Finding: A noncompliance, observation (or finding) (positive or negative), or a Commendation (or Best Practice) documented by the Audit Team.

- 3.4 Audit Guide: A set of preliminary questions to be covered during the audit based on requirements from Agency-level SMA documents, industry standards, and NASA Center-specific procedures and requirements.
- 3.5 Audit In-Brief: A meeting during the first day of the OSMA IFO SMA Audit led by the Audit Team Leader to inform the NASA Center Director and his senior management on the purpose, scope, and Audit week schedule as well as other administrative aspects of the OSMA IFO SMA Audit. Also, during this meeting, the NASA Center provides a short presentation to the Audit Team on the functions of their Center related to the focus areas of the audit, results of recent audits (and status of corrective actions), and any recent issues and concerns.
- 3.6 Audit Out-Brief: A meeting on the final day of the OSMA IFO SMA Audit led by the selected OSMA Division Director and Audit Team Leader to communicate IFO SMA Audit results to the audited NASA Center Director and senior management, its respective Headquarters' Office responsible for its institutional management, and Chief Safety and Mission Assurance.
- 3.7 Auditor Package: Notebooks containing information, including the Audit Guide, to aid auditors during the OSMA IFO SMA Audit.
- 3.8 Audit Report: A report of the results of the OSMA IFO SMA Audit that includes an Executive Summary and all of the Audit Findings as well as Commendations/Best Practices.
- 3.9 Audit Team: A team comprised of Subject Matter Experts (SMEs) from NASA Headquarters, NASA Centers (other than the one being audited), and possibly organizations external to NASA selected to conduct the OSMA IFO SMA Audit.
- 3.10 Audit Team Announcement Letter: Correspondence issued by the Director, Review and Assessment Division (RAD), and the Audit Team Leader to the NASA Center Director and SMA Director that contains a listing of auditors and their security information and areas they will be auditing.
- 3.11 Audit Team Leader: Member of OSMA, Review and Assessment Division, assigned to execute the required Pre-Audit, Audit, and Post-Audit actions for each OSMA IFO SMA Audit.
- 3.12 Chief SMA: Chief Safety and Mission Assurance
- 3.13 Commendation/Best Practice: A process or method that would provide significant benefit to other Centers if adapted/implemented, or, acknowledgement of a requirement/process that the Center accomplishes extraordinarily well.
- 3.14 Corrective Action Plan: Report submitted by the audited NASA Center to OSMA and their respective Headquarters Office responsible for its institutional management addressing the planned course of actions to correct and prevent all findings of noncompliance and observations.
- 3.15 Corrective Action Status Report: Report submitted by the audited NASA Center to NASA Center OSMA and their respective Headquarters Office responsible for its institutional management providing an analysis of root cause, containment actions, and the status of long-term corrective and preventive actions, as applicable, for each Audit Finding of noncompliance and observations.
- 3.16 Executive Summary: The first part of the Audit Report, which discusses the overall level of compliance in each Audit Focus Area and significant Audit Findings.

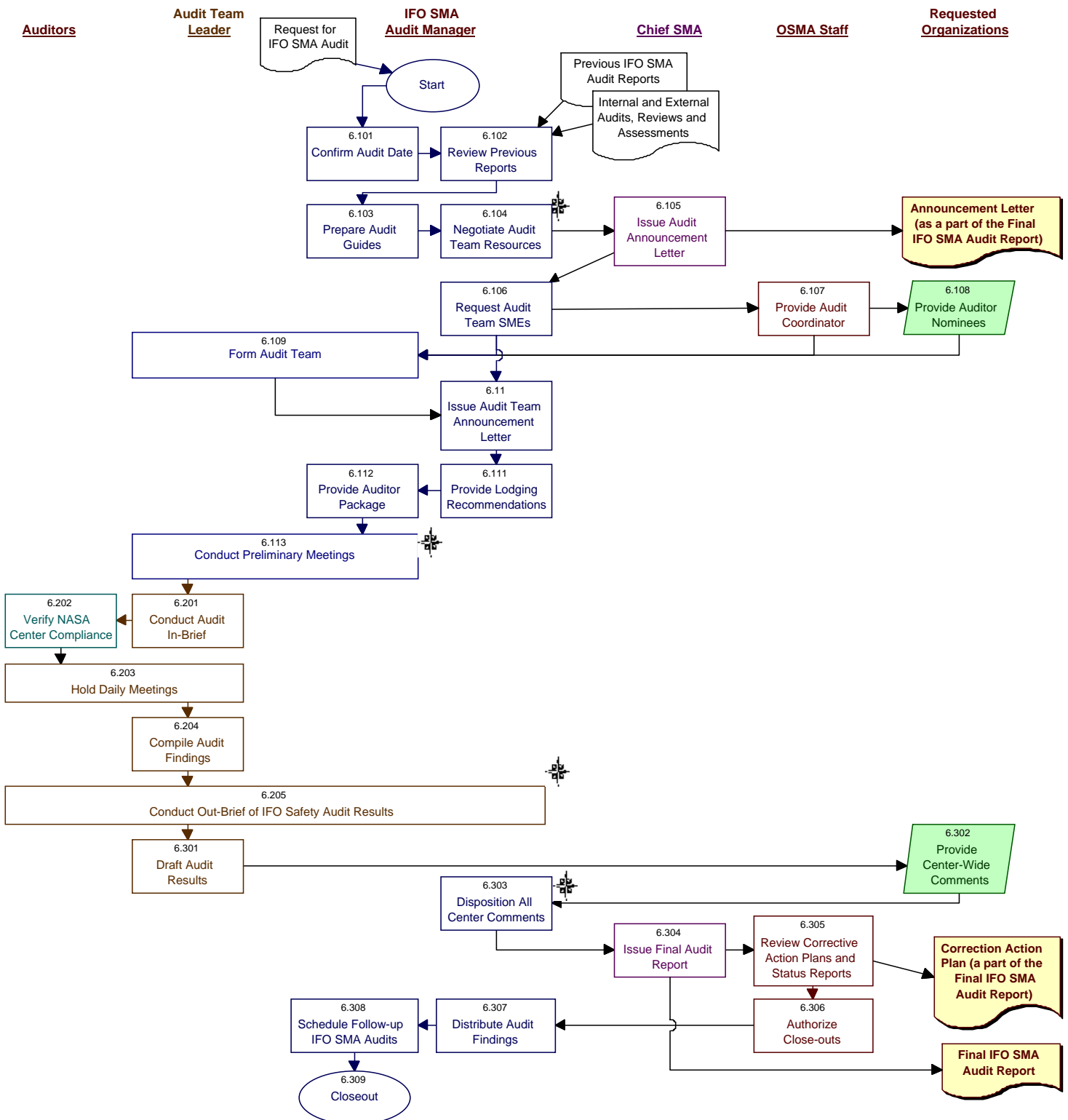
- 3.17 IFO SMA Audit: (aka: The Audit) An independent review of NASA Center compliance with Institutional, Facility, and Operational SMA requirements. This includes Federal, State, or local safety requirements as well as NASA SMA requirements, whichever are more stringent.
- 3.18 Noncompliance: A failure to comply with Federal, State, local, Agency, or Center requirements. Continuing non-compliances could lead to the loss of life, injury to NASA personnel or public, loss of or damage to high-value equipment, or reduce the likelihood of mission success.
- 3.19 Observation: A condition that is not contrary to documented requirements, but, in the judgment of the auditor, warrants improvement or clarification.
- 3.20 SMARTS: SMA Requirements Tracking System.

4. Reference Documents

The documents listed in this section are used as reference materials for performing the processes covered by the Quality Management System (QMS). Since all NASA Headquarters Level 1 (QMS Manual) and Level 2 (Headquarters Common Processes) documents are applicable to the QMS, they need not be listed in this section unless specifically referenced in this OSMA HOWI.

- 4.1 NPD 8710.2, "*NASA Safety and Health Program Policy.*"
- 4.2 NPD 8710.5, "*NASA Safety Policy for Pressure Vessels and Pressurized Systems.*"
- 4.3 NPD 8730.1, "*Metrology and Calibration.*"
- 4.4 NPR 8621.1, "*NASA Procedural Requirements for Mishap Reporting, Investigating, and Recordkeeping.*"
- 4.5 NPR 8715.1, "*NASA Safety and Health Handbook Occupational Safety and Health Programs.*"
- 4.6 NPR 8715.3, "*NASA Safety Manual.*"
- 4.7 NPR 8715.4, "*In-Service Inspection of Ground-Based Pressure Vessels and Systems.*"
- 4.8 NPR 8715.17, "*Range Safety Program (DRAFT).*"
- 4.9 NPR 8735.1, "*Procedures for Exchanging Parts, Materials, and Safety Problem Data Utilizing the Government-Industry Data Exchange Program and NASA Advisories.*"
- 4.10 NSS 1740.10, "*NASA Safety Standard for Underwater Facility and Non-Open Water Operations.*"
- 4.11 NSS-1740.12, "*Safety Standard for Explosives, Propellants and Pyrotechnics.*"
- 4.12 NASA-STD-8719.7, "*Facilities Systems Safety Guidebook.*"
- 4.13 NASA-STD-8719.9, "*Safety Standard for Lifting Devices and Equipment.*"
- 4.14 NASA-STD-8719.11, "*NASA Safety Standard for Fire Protection.*"

5. Flowchart



6. Procedure

6.1 Pre-Audit Planning Phase

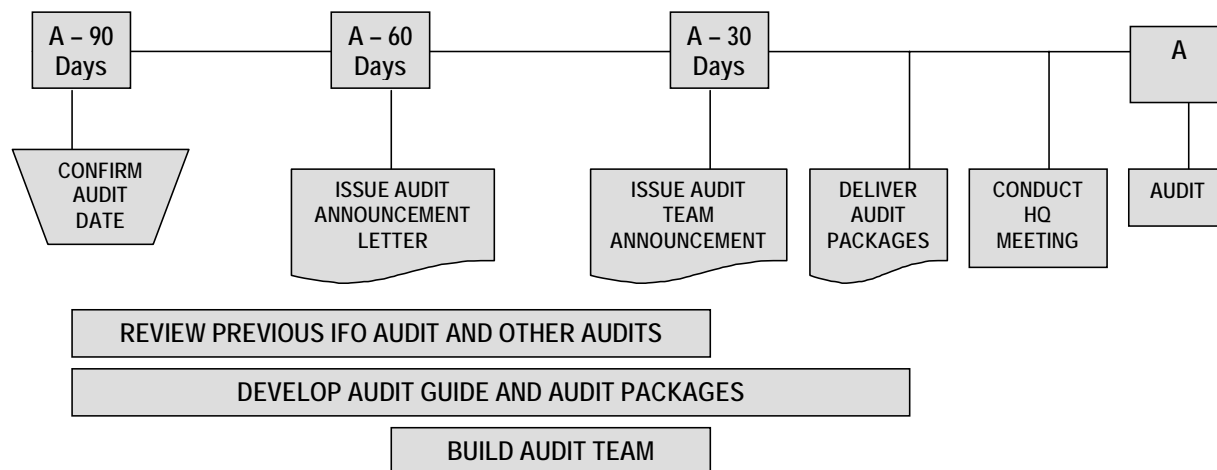


Figure 1. Timeline of Pre-Audit Actions

6.1.01 IFO SMA Audit Manager Confirm Audit Date

Approximately 90 days prior to the start of each IFO SMA Audit, the IFO SMA Audit Manager shall contact the SMA Director at the NASA Center/Facility to be audited (referred to as the “NASA Center” hereafter) to negotiate the Audit date suggested in the annual IFO SMA Audit Schedule.

Any adjustment of the Audit date will be based on negotiation with the IFO SMA Audit Manager and approval by the Chief SMA.

6.1.02 IFO SMA Audit Manager Review Previous Reports

The IFO SMA Audit Manager shall review the previous OSMA IFO SMA Audit Report and other SMA-related review reports conducted at or by the NASA Center along with associated corrective actions to identify potential problem areas for follow-up during the upcoming Audit. Reviewing these documents will help to reduce any overlap/duplication of effort among recent reviews and focus the attention on items needing follow-up. Examples of reviews and reports that could relate to the IFO SMA Audits include, but are not limited to:

Mishap/Close-Call Investigations, Operational Readiness Inspections (ORIs), OSHA reports (periodic inspections, complaint/facility inspections, Voluntary Protection Program (VPP) Evaluations), Operations and Engineering Panel (OEP) Reviews, Quality Inspections, Federal Aviation Administration (FAA) Inspections, Department of Energy (DOE) Audits, Inter-Center Aircraft Operations Panel (IAOP) Reviews, Nuclear Regulatory Commission (NRC) Audits, NASA Headquarters Medical/Health and Audits, Aerospace Safety Advisory Panel (ASAP) Reviews.

6.1.03 IFO SMA Audit Manager Prepare Audit Guides

The IFO SMA Audit Manager shall prepare an Audit Guide to provide auditors with a set of preliminary questions to be covered during the audit. The attributes in the Audit Guide are based on requirements from Agency-level SMA documents, industry standards, and NASA Center-specific procedure and requirements. OSMA's SMA Requirements Tracking System (SMARTS) can be used as a source of SMA-related requirements.

The guide should also be tailored to include attributes for any recently reported problems or follow-up of specific problem areas identified during previous IFO SMA Audit (or other related related Audit) or other reviews. The guide may also be scaled back in those areas that were adequately reviewed during recent reviews.

6.1.04 IFO SMA Audit Manager Negotiate Audit Team Resources

The IFO SMA Audit Manager shall negotiate needed Audit Team resources with the OSMA Division Directors, NASA Center SMA Offices, and with external sources to identify and ensure that resources are properly allocated to meet the objective and scope of the audit.

6.1.05 Chief SMA Issue Audit Announcement Letter

Approximately 60 days prior to the Audit, the Chief SMA, with support by the IFO SMA Audit Manager, shall issue an Audit Announcement Letter to the NASA Center Director and Center SMA Director. This letter contains details on the scope and duration of the Audit and any actions that the NASA Center Director and Center SMA Director are requested to take in preparation for the Audit and to support the Audit Team during the Audit.

6.1.06 IFO SMA Audit Manager Request Audit Team Subject Matter Experts (SME)

Approximately 60 days prior to the audit, the IFO SMA Audit Manager shall request support from NASA Headquarters, NASA Centers, and possibly from non-NASA organizations in forming the Team of SME Auditors for the Audit. Auditors will be proposed to the IFO SMA Audit Manager. Note: The IFO SMA Audit Manager shall take special care to limit requests for auditors to ONLY those that are directly needed.

6.1.07 MSD Division Director Provide Audit Coordinator

The OSMA Mission Support Division (MSD) Director shall provide an Audit Coordinator to assist in the liaison among OSMA, the site being audited, and the Audit Team for each Audit.

6.1.08 Requested Organizations Provide Auditor Nominees

Requested organizations shall provide nominees to assist in the audit as auditors, technical support or administrative support as requested by the IFO SMA Audit Manager and the Chief SMA. Auditors from the NASA Center being audited will not normally be requested.

6.1.09 IFO SMA Audit Manager and Audit Team Leader Form Audit Team

The IFO SMA Audit Manager and the Audit Team Leader shall select the Audit Team members and support based on the recommendations and the personnel availability, knowledge, skills, and experience.

6.1.10 IFO SMA Audit Manager Issue Audit Team Announcement Letter

Approximately 30 days prior to the Audit and with the concurrence of the IFO SMA Audit Manager, the Director, RAD, shall issue an Audit Announcement Letter to the NASA Center Director and Center SMA Director. This letter shall contain a list of auditors, any security information, and areas to be addressed. The letter may also request additional actions that the NASA Center is requested to take in preparation for the Audit.

6.1.11 IFO SMA Audit Manager Provide Lodging Recommendations

The IFO SMA Audit Manager shall provide travel and lodging recommendations for the Audit Team. Each Audit Team Member will be responsible for making his or her own arrangements.

6.1.12 IFO SMA Audit Manager Prepare Auditor Package

The IFO SMA Audit Manager with the Audit Team Leader and Audit Coordinator shall prepare Audit Packages containing information to aid auditors during the Audit. Specific types of information may include: Audit Announcement Letter, Audit Guide, summaries of the previous IFO SMA Audit Report (or related Audit Report), summaries of other recent audits/reviews, etc.

The Auditor Package shall be provided to auditors 20 to 30 days in advance of the Audit to support auditors' preparation.

6.1.13 IFO SMA Audit Manager and Audit Team Leader Conduct Preliminary Meetings

Prior to the Audit, the IFO SMA Audit Manager and the Audit Team Leader shall conduct preliminary meeting(s) with the Audit Team members from NASA Headquarters. The purpose of the preliminary meeting(s) is to discuss the focus and goals of the upcoming Audit, any recent issues or concerns of the NASA Center being audited, and any administrative audit/travel logistics.

6.2 On-Site Audit Process (Nominal)

This section describes the nominal one week on-site audit approach. This process may be supplemented with other activities to facilitate compliance verification and observation of critical processes.

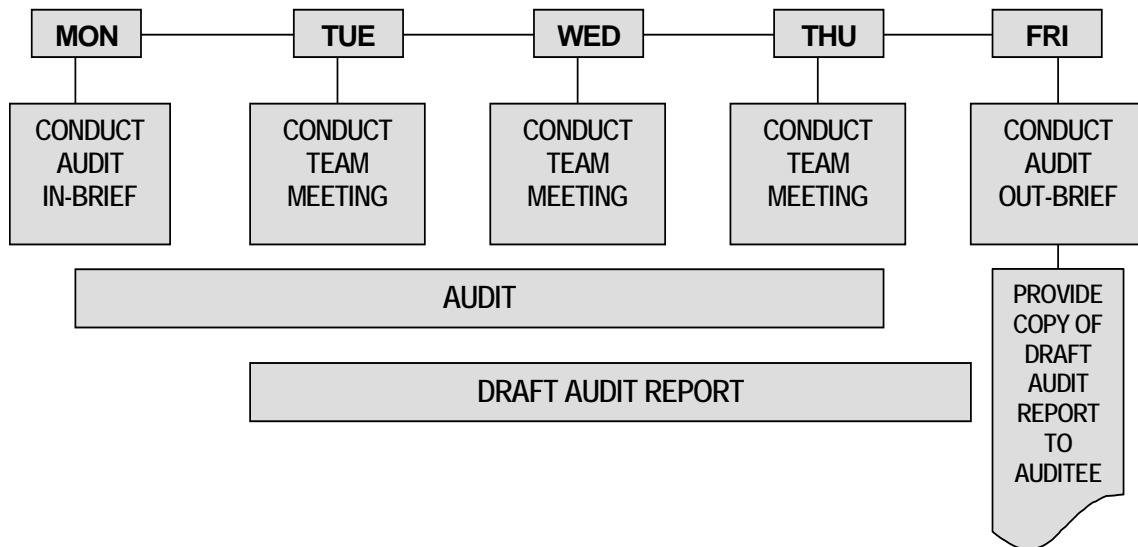


Figure 2. Timeline of Auditing Actions

6.2.01 Audit Team Leader Conduct Audit In-Brief

Nominally on Monday afternoon, the Audit Team Leader along with Audit Team shall conduct an Audit In-Brief to the audited NASA Center Director and his senior management (including SMA Director). The objective of the Audit In-Brief is to inform the Center Director and senior management on the purpose, scope, and Audit week schedule as well as other administrative aspects of the Audit. During the In-Brief, the following will nominally occur:

1. Provide a Short Presentation. The NASA Center shall provide a short presentation to the Audit Team on the functions of their Center related to the focus of the audit, results of recent audits (and status of corrective actions), and any recent issues and concerns.
2. Review List of Scheduled Audit Interviews. Based on coordination and discussions between the Audit Team Leader and the Center SMA Director during the Pre-Audit planning phase, the NASA Center shall provide a list of scheduled Audit interviews for all Focus Areas being audited as well as points of contact for each Audit Focus Area.

6.2.02 Audit Team Verify NASA Center Compliance

Audit Team members shall verify compliance with SMA process and technical requirements by:

- Reviewing organization requirements and procedures to ensure Agency-Level SMA requirements are appropriately flowed down,
- Reviewing documentation and records of certifications, completed work, training,
- Interviewing organizational personnel,
- Observing first hand the practices that reflect the organization's processes and procedures.

Audit Guides shall be annotated by auditors during the Audit process to document areas reviewed, level of compliance, and any suggestions to improve the quality of the Audit Guide.

Findings shall be documented by auditors and categorized as defined in Section 3 above:

- Noncompliance
- Observation
- Commendation/Best Practice

6.2.03 Audit Team Leader Hold Daily Meetings

The Audit Team Leader shall hold daily meetings with the Audit Team to discuss the audit progress, upcoming activities, significant findings, and problems, and to help ensure that the goals of the Audit are fulfilled.

6.2.04 Audit Team Leader Compile Audit Findings

On Thursday afternoon, the Audit Team Leader, with support by the Audit Coordinator and administrative personnel, shall:

- Collect and review work accomplished per the selected Audit Guides to verify that all audit areas defined by the scope of the audit were covered.
- Compile all Audit Findings into a Draft IFO SMA Audit Report.
- Prepare an Out-Brief of the Audit results.

6.2.05 Audit Team Leader Conduct Out-Brief of IFO SMA Audit Results

On the final day of the Audit week (normally, Friday), the Audit Team Leader shall conduct an Audit Out-Brief of the Audit results to the audited NASA Center Director and senior management, its respective Headquarters' office responsible for its institutional management, and the Chief SMA. The final step of the Out-Brief is to leave a copy of the Draft Audit Report with the NASA Center Director and SMA Director to support immediate development of a corrective action plan.

6.3 Post-Audit Actions

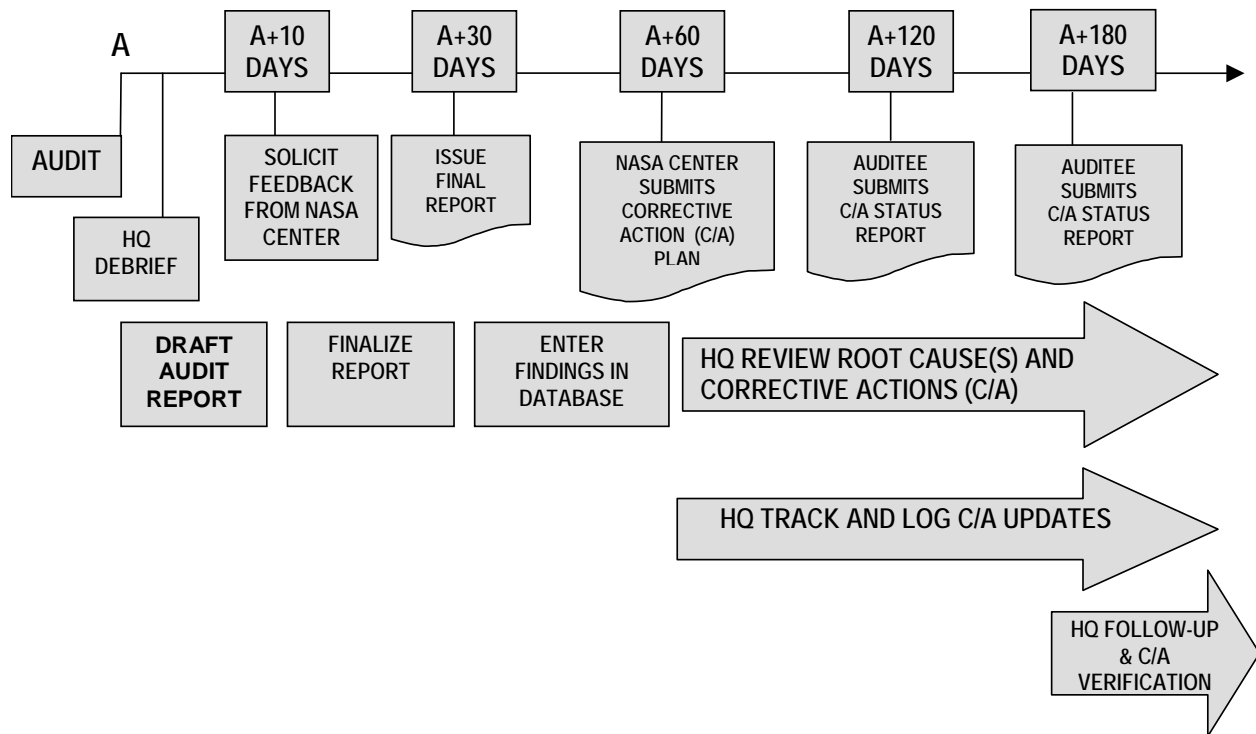


Figure 3. Timeline of Post-Audit Actions

6.3.01 Audit Team Leader Draft Audit Results

Upon completion of the Out-Brief on the Audit results, a draft of the findings and commendations shall be provided to the NASA Center SMA Director for official review and comment. The NASA Center SMA Director will be requested to coordinate all Center comments.

The NASA Center SMA Director shall coordinate with all other Center organizations that have IFO SMA responsibilities for all reviews and comments.

6.3.02 NASA Center SMA Director Provide Center-wide Comments

The NASA Center SMA Director shall provide any Center-wide comments to the IFO SMA Audit Manager within 10 days of receiving the draft audit findings and commendations that were provided at the Audit Out-Brief.

6.3.03 IFO SMA Audit Manager Disposition All Center Comments

All Center comments shall be dispositioned by the IFO SMA Audit Manager prior to issuing the Final Audit Report.

6.3.04 Chief SMA Issue Final Audit Report

The Chief Safety and Mission Assurance shall issue the Final IFO SMA Audit Report to the NASA Center Director and its respective Headquarters Office responsible for its institutional management within 30 days after the Audit. The report may be distributed to other NASA Center SMA Directors as part of lessons-learned or best practices.

Within 30 days after the receipt of the Final Audit Report (as shown in Figure 3), the NASA Center Director, with support by the Center SMA Director, shall provide OSMA and their respective Headquarters office responsible for its institutional management with a Corrective Action Plan addressing all findings of noncompliance. The Corrective Action Plan shall contain an analysis of root cause, containment actions, and planned long-term corrective and preventive actions, as applicable, for each Audit Finding of noncompliance.

Every 60 days thereafter, the NASA Center SMA Director shall provide updates to OSMA in Corrective Action Status Reports to the Audit. These reports shall provide an update on the progress of corrective and preventive actions.

6.3.05 OSMA Staff Review Corrective Action Plans and Status Reports

Selected OSMA Staff shall review Corrective Actions Plans and Corrective Action Status Reports and provide feedback to the NASA Center regarding the adequacy of the plan/actions taken.

6.3.06 OSMA Staff Authorize Close-outs

NASA Headquarters' OSMA RAD shall be the close-out authority for all Audit Findings and shall track all Audit Findings until closure.

6.3.07 IFO SMA Audit Manager Distribute Audit Findings

For any Audit Findings requiring action by NASA Headquarters or a NASA Center other than the one audited, OSMA shall distribute those findings to the applicable Responsible Organizations or Center SMA Directors for disposition as described in paragraph 6.3.03.

6.3.08 IFO SMA Audit Manager Schedule Follow-up IFO SMA Audits

Follow-up IFO SMA Audits may be scheduled at the discretion of OSMA to verify implementation of corrective and preventive actions in IFO SMA areas found to be weak during the last Audit, or in those areas unable to be reviewed during the Audit.

6.3.09 IFO SMA Audit Manager Closeout

When audit results are filed and corrective action work is underway, the IFO SMA Audit Manager can close the process.

7. Quality Records

| Record ID | Owner | Location | Media Electronic /hardcopy | Schedule Number & Item Number | Retention & Disposition |
|--|----------------------------|-----------------|----------------------------|-------------------------------|--|
| Internal and External Audits, Reviews, and Assessments | OSMA IFO SMA Audit Manager | RAD Files | Hardcopy | Schedule: 1 Item: 7.A | Retire to FRC 2 years after IFO SMA Audit completion then transfer to NARA 10 years after IFO SMA Audit (Final Report contains copy of Presentation) |
| Final IFO SMA Audit Report | OSMA Corres Control | OSMA Chron File | Hardcopy | Schedule: 1 Item: 22 | Retire to FRC 5 years after IFO SMA Audit completed in 5 year blocks, then retire to NARA when 10 years old (Final Report contains copy of Letter) |
| Corrective Action Plan | OSMA IFO SMA Audit Manager | RAD Files | Hardcopy | Schedule: 1 Item: 7.A | Retire to FRC 2 years after IFO SMA Audit completion then transfer to NARA 10 years after IFO SMA Audit (Final Report contains copy of Presentation) |

Appendix A: List of Acronyms

| | |
|-------|---|
| ASAP | Aerospace Safety Advisory Panel (ASAP) |
| C/A | Corrective Action |
| DOE | Department of Energy |
| FAA | Federal Aviation Administration |
| GIDEP | Government-Industry Data Exchange Program |
| HQ | Headquarters |

| | |
|----------|---|
| IFO | Institutional/Facility/Operational |
| NASA-STD | NASA Standard |
| MSD | Mission Support Division |
| NPD | NASA Policy Directive |
| NPR | NASA Procedural Requirement |
| NSS | NASA Safety Standard |
| OEP | Operations and Engineering Panel |
| ORI | Operational Readiness Inspections |
| OSHA | Occupational Safety and Health Administration |
| OSMA | Office of Safety and Mission Assurance |
| RAD | Review and Assessment Division |
| SMA | Safety and Mission Assurance |
| SME | Subject Matter Expert |
| VPP | Voluntary Protection Program |