United States Forest Service

National Aviation Safety Management System Guide

FY 2024-2026

U.S. Department of Agriculture, Forest Service Guide

October 1, 2023
Revision 5.0

Forest Service **Washington Office** **1400 Independence Avenue, SW**
Washington, D.C. 20250

File Code: 5700 **Date:** April 18, 2024
Route To:

Subject: 2024 National Aviation Safety Management System Guide

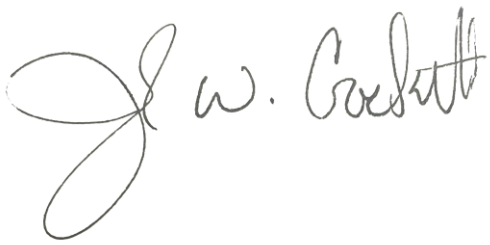
To: Deputy Chiefs, Regional Foresters, and Station Directors

The updated Forest Service *National Aviation Safety Management System Guide* (NASMSG) for FY 2024-2026 is approved.

The *National Aviation Safety Management System Guide* documents Fire and Aviation Management leader's intent and describes authority, roles and responsibilities, programs and activities for the application, implementation, and maintenance of the Aviation Safety Management System (ASMS) in the Forest Service and for its aviation service providers.

All content in the FY 2024-2026 *National Aviation Safety Management System Guide* is now effective. This dynamic document is designed to guide the continued implementation of Aviation Safety Management Systems in accordance with the Federal Management Regulations (41 CFR 102-33 - Management of Government Aircraft) and Forest Service policy (FSM 5700 and FSH 5709.16). The *National Aviation Safety Management System Guide* will provide the necessary procedures, principles, and practices to construct and support a sound aviation safety culture. This guide will be updated every three years, and a copy of this letter will be included in the front of the guide.

The FY 2024-2026 *National Aviation Safety Management System Guide* is available at the U.S. Forest Service and Interagency Aviation Publications website found at this link: https://www.fs.usda.gov/managing-land/fire/aviation/publications.



JOHN W. CROCKETT
Deputy Chief, State, Private, and Tribal Forestry

Enclosure

cc: Jeff Marsolais, Alex Robertson, Anthony Bethas, Sarah Fisher, Adam Mendonca, Clint Cross, Paul Linse, Erin Phelps, Dave Haston, Denise Blankenship, Aviation Branch Chiefs, Regional Fire Directors, Regional Aviation Officers, Regional Aviation Safety Managers

Revision History

Date	Document Version	Document Revision Description	Document Author
12/21/2012	1.0	Initial document release	BCASMS
12/15/2013	2.0	Interim document revision	BCASMS
06/222016	30	Interim document revision	BCASMS
08/26/2019	4.0	Interim document revision	BCASMS
02/01/2023	5.0	Interim document revision	BCASMS

Important: How to Use This Guide

This guide is the official National Aviation Safety Management Systems Guide (NASMSG), for the US Forest Service. All previous versions are obsolete. The implementation of Aviation Safety Management Systems (ASMS) provides the agency with a systematic approach to managing safety risks in aviation. The ASMS principles and practices found in this guide are instituted from internationally accepted industry standards. A consistent approach to ASMS implementation promotes organizational understanding and fosters a safety culture. Key to the success of ASMS is leadership commitment at both national and regional levels, and employee involvement.

This National Aviation Safety Management Systems Guide provides a basic understanding of the four components and the 12 elements of ASMS to ensure compliance with statutory requirements, agency policies, and industry best practices (see NASMSG Section 1.3 References, pg. 7). To further develop ASMS understanding and enhance implementation, additional training in ASMS is recommended.

Each ASMS component contains elements that describe specific needs for the successful implementation and maintenance of the aviation safety management system. The following table was adapted from the International Civil Aviation Organization (ICAO) and provides a quick reference to the basic requirements of a functioning ASMS. The table below organizes this information showing the relationship between the 4 components and the 12 safety management system elements:

Forest Service Aviation Safety Management System	
4 Components	**12 Elements**
1. Safety Policy and Objectives: *"Establishes management's commitment to safety and sets the sideboards to work within"*	**1.1** Management Commitment **1.2** Safety Accountability and Responsibilities **1.3** Appointment of Key Safety Personnel **1.4** Coordination of Emergency Response Planning **1.5** Safety Management System Documentation
2. Safety Risk Management *"Formalized way of identifying and managing hazards"*	**2.1** Hazard Identification **2.2** Safety Risk Assessment and Mitigation
3. Safety Assurance *"Processes that verify ASMS policies, procedures and practices are properly applied and continue to achieve agency safety goals & objectives"*	**3.1** Safety Performance Monitoring and Measurement **3.2** The Management of Change **3.3** Continuous Improvement of the SMS
4. Safety Promotion *"Ensures aviation personnel are informed, knowledgeable and competent to perform safety management duties"*	**4.1** Training and Education **4.2** Safety Communication

Scalability: This Guide provides overarching, broadscale direction, but it is important for Regions or Units to evaluate individual safety systems and make the direction scalable while still meeting agency requirements of an ASMS. Decisions on scalability can be communicated through respective regional directive supplements.

- ASMS implementation should correspond to the size and the complexity of the region's aviation program.
- Regions can use this guide as the parent document and tier to it to build individual ASMS protocols. These protocols should be developed similar to those in the National Aviation Safety and Management Plan (NASMP).

Monitoring For Success:

- Each Region or unit should develop Safety Performance Indicators (SPIs). A safety performance indicator is defined in the ICAO Safety Management Manual as a measure (or metric) used to express the level of safety performance achieved in a system.
- Progress on addressing agency ASMS priorities and objectives will be measured through Key Performance Indicators (KPI)- See USDA Forest Service Aviation Strategic Plan FY 2022-2026.
- ASMS Evaluation: the ASMS Evaluation tool found in this guide can be used as a template to assess the level of implementation (maturity) and functionality of the Agency's ASMS at the National and Regional levels.

Guide Updates:

- The guide will be updated at 3-year intervals, with the solicitation for comment during the second year.

Outcomes: Implementation of ASMS provides a pathway to assist in achieving Aviation Strategic goals (Source: USDA Forest Service Aviation Strategic Plan FY 2022-2026):

- Prevent mishaps through proactive risk management.
- Take care of our people.
- Organize for success.
- Explore, evaluate, and adopt emerging technology to achieve the aviation mission more efficiently.

Table of Contents

Chapter 1. Introduction

1.1 Background

Aviation Safety Management Systems (ASMS) is the formal, top-down, organization-wide approach to managing safety risk and assuring the effectiveness of safety risk controls. It includes systematic procedures, practices, and policies for the management of safety risk (FAA Order 8000.369).

ASMS introduces an evolutionary process in system safety and safety management, providing a structured process that obligates organizations to manage safety with the same level of priority that other core business processes are managed. This applies to both internal and external aviation operations (Agency & Product Service Provider).

The goal is to develop a safety culture that balances production and protection, reducing risk to as low as reasonably practicable while still allowing for mission accomplishment.

1.2 Scope of the Safety Management System

The purpose of this guide is to assist in fulfilling applicable laws, regulations and agency policies including the requirements of FSM 5700, FSH 5709.16, the National Aviation Strategy and the National Aviation Safety and Management Plan, with respect to the implementation of Aviation Safety Management Systems (ASMS). This guide provides best practices for the application of ASMS in the Forest Service and for its service providers.

The objective is to incorporate the following four components and 12 elements of ASMS as a structured management approach to control safety risks during operations in support of agency objectives:

A. Safety policy and objectives

   Management commitment and responsibility

   Safety accountabilities

   Appointment of key safety personnel

   Coordination of emergency response planning (accident and incident investigation)

   SMS documentation

B. Safety risk management

   Hazard identification

   Safety risk assessment and mitigation

C. Safety assurance

   Safety performance monitoring and measurement

   The management of change

   Continuous improvement of the SMS

D. Safety promotion

   Training and education

Safety communication

This document provides guidance for ASMS development applicable to all Forest Service aviation operations. Statements containing the words must, shall, and will are directive in nature and the corresponding policy can be found in the FSM 5700. This Guide contains best practices for Aviation Safety Management Systems in the aviation program, thus the terms "may" and "should" indicate the best practice or an industry standard that allows some discretion in its execution.

1.3 References

This Guide is in accordance with the following documents, as revised:

A. FSM 5700, Aviation Management Manual.

B. FSH 5709.16; Aviation Management Handbook.

C. 41 CFR 102-33 Management of Federal Aircraft.

D. FAA Advisory Circular 120 – 92b (or current version).

E. ICAO System Management Manual Doc 9859.

F. FSM 6700, Safety and Health Program.

1.4 Definitions

Note	Definitions in this guide are specific to the ASMS process and may not read the same as definitions in sections of the FSM 5100, 5700 or 6100/Personnel Management.

Aircraft Accident. An occurrence associated with the operation of an aircraft which takes place between the time any person boards the aircraft with the intention of flight and the time all such persons have disembarked, and in which any person suffers death or serious injury or in which the aircraft receives substantial damage. During a jump sequence, a Forest Service smokejumper is considered to have safely disembarked the aircraft after detaching from the static line from the parachute deployment system and when the parachute canopy has successfully deployed. (Refer to 14 CFR NTSB 830 for definition of reportable accidents).

Air Safety Investigator (ASI) – A Federal employee who has education, expertise, and experience in aviation mishap investigation; has knowledge of environmental, human, and materiel factors and analysis; is tasked to investigate mishaps and generate the aviation mishap investigation report (AMIR). May also serve as a lead investigator.

Best practices – Common industry policies and procedures that result in a high quality of safety and performance.

Contractor – A person or agency that is financially procured by the Government to provide goods or services. Also referred to as a **vendor**.

Corrective action – Action to eliminate (remove) or mitigate (lessen) the cause or reduce the effects of a detected nonconformity or other undesirable (unwanted) situation.

Hazard – Any existing or potential condition that can lead to injury, illness, or death; damage to or loss of a system, equipment, or property; or damage to the environment. A hazard is a condition that might cause (an accident or incident).

Incident –

- Aircraft Incident. An occurrence, other than an accident, associated with the operation of an aircraft that affects, or could affect, the safety of operations. (49 CFR 830.2)
- Incident With Potential (IWP): An incident that narrowly misses being an accident and in which the circumstances indicate significant potential for substantial damage or serious injury. The BC-ASMS determines when an incident may be classified as IWP in consultation with the RASO and if it is reportable to NTSB.

Lessons learned – Knowledge or understanding gained by experience, which may be positive, such as a successful test or mission, or negative, such as a mishap or failure. Lessons learned should be developed from information obtained from inside and outside of the organization and/or industry.

Line Officer: Managing officer or designee of the Agency, division thereof, or jurisdiction having statutory responsibility for incident mitigation and management.

Mishap – A broad term that includes aircraft accidents, incidents with potential, and incidents.

National Aviation Safety Council (NASC) – Council Comprised of RASO's, FHP program manager, the Branch Chief, Aviation Safety Management System (BC-ASMS) and other non-voting members outlined in the NASC charter.

Operational Control – The exercise of authority over initiating, conducting, or terminating a flight (14 CFR Part 1.1).

Qualified Technical Investigator (QTI) – A Washington Office approved individual, such as the RASO or RASO designee, having applicable aviation safety training and aviation technical experience, and who may be assigned by the BC-ASMS to lead or participate in mishap investigations.

Quality Assurance (QA) - A set of planned activities within a product manufacturing process that ensures the safety and quality of the product. Usually, a proactive process completed at different stages throughout production. To be fully effective within an ASMS, requires close alignment with risk management component and, specifically, risk control monitoring and evaluation (see Safety Assurance).

Quality Control (QC) - The systematic set of processes used to ensure that a product meets required quality standards. Usually a reactive process, completed after production.

Regional Aviation Safety Officer (RASO) – (formerly RASM) is responsible for the development, operation, and continuous improvement of the regional ASMS. The RASO is the focal point for safety management issues in the region.

Residual Safety Risk – The safety risk that exists after all controls have been implemented or exhausted and verified. Only verified controls can be used for assessing residual safety risk.

Risk – The composite of predicted severity (how bad) and likelihood (how probable) of the potential effect of a hazard in its worst credible (reasonable or believable) system state. The terms *risk* and *safety risk* are interchangeable.

SAFECOM –Aviation Safety Communiqué, is to report any condition, observation, act, maintenance problem or circumstance with personnel or the aircraft that has the potential to cause an aviation-related mishap. SAFECOM should also be used for reporting positive safety actions and mishap prevention measures. SAFECOM submissions can be accessed and submitted at www.safecom.gov.

Safety Assurance (SA)– Monitoring the performance of the safety management system, processes, and procedures on a routine basis to determine the performance and effectiveness of safety risk controls. This is achieved through the gathering and analysis of data to ensure risk controls: are properly implemented throughout the aviation organization, are effective as intended, and do not create unintended consequences or new hazards. A related purpose of SA is to monitor the aviation programs systems to detect the presence of new hazards, whether they are generated internally or externally to the organization.

Safety culture – The product of individual and group values, attitudes, competencies, and patterns of behavior that determine the commitment to, and the style and proficiency of, the organization's management of safety. Organizations with a positive safety culture are characterized by communications founded on mutual trust, by shared perceptions of the importance of safety and by confidence in the efficacy of preventive measures.

Safety Management System (SMS) – The formal, top-down business-like approach to managing safety risk. It includes systematic procedures, practices, and policies for the management of safety (as described in this document it includes safety risk management, safety policy, safety assurance, and safety promotion).

Safety objective[1] – A goal or desirable outcome related to safety. Generally based on the organization's safety policy and specified for relevant functions and levels in the organization. Safety objectives are typically measurable.

Safety planning[2] – Part of safety management focused on setting safety objectives and specifying needed operational processes and related resources to fulfill these objectives.

Safety risk – The composite of predicted severity (how bad) and likelihood (how probable) of the potential effect of a hazard in its worst credible (reasonable or believable) system state. The terms *safety risk* and *risk* are interchangeable.

Safety risk control – A characteristic of a system that reduces or mitigates (lessens) the potential undesirable effects of a hazard. Controls may include process design, equipment modification, work procedures, training, or protective devices. Safety risk controls must be written in requirements language, measurable, and monitored to ensure effectiveness.

Safety Risk Management (SRM) – A formal process within the ASMS that describes the system, identifies the hazards, assesses the risk, analyzes the risk, and controls the risk.

Safety promotion – A combination of safety culture, training, and data sharing activities that support the implementation and operation of an ASMS in an organization.

Severity – The degree of loss or harm resulting from a hazard.

Standards – A policy is a written course of action to guide and determine present and future decisions.

- A process is a set of interrelated activities that use resources to transform inputs into outputs.

[1] Adapted from definition 3.2.5 in ISO 9000-2000 for "quality objectives."
[2] Adapted from definition 3.2.9 in ISO 9000-2000 for "quality planning."

- A procedure is a series of steps followed methodically to complete an activity: what shall be done and by whom, when, where, and how it shall be completed; what materials, equipment, and documentation shall be used, and how it shall be controlled.
- A system is a set of interrelated elements; and
- A program is a set of arrangements that are intended to achieve a specific purpose.

Chapter 2. Safety Management Policy

2.1 Management Commitment

The Forest Service is committed to the development and implementation of policies, principles and practices that are consistent with the agency's core safety values and industry best practices. The Forest Service will achieve a culture of safety excellence through leadership, commitment, and involvement of all employees in the implementation of Aviation Safety Management Systems (ASMS).

Management's commitment to ASMS includes:

A. Providing necessary resources to execute and maintain the ASMS framework (policy, risk management, safety assurance and safety promotion), including resources necessary to meet objectives set forth in the USDA Forest Service Aviation Strategic Plan.

B. Providing clearly defined duties, responsibilities, and accountabilities for all employees to participate in the ASMS.

C. Ensuring aviation industry best practices are being utilized for mishap prevention by supporting:

mishap investigations conducted by the agency's aviation professionals.

aviation risk management in accordance with interagency aviation standards.

D. Providing and supporting training of all employees commensurate with job responsibilities.

E. Ensuring compliance with agency policy and the federal aircraft management regulations for management of government aircraft (41 CFR 102-33).

F. Establishing safety performance goals and measuring agency safety performance.

G. Supporting internal and external audits, inspections, and reviews to identify and manage risk and improve safety and efficiency.

2.2 Chief's Safety Intent

The Chief of the Forest Service releases an annual letter providing leadership direction and intent for wildland fire management activities. Where this letter specifically provides safety direction applicable to safe aviation operations, all employees, contractors, and volunteers must abide by the direction and intent of the letter.

2.3 Accountable Executive

The ASMS model defines the Accountable Executive (AE) as the individual with the ultimate authority and accountability for the ASMS. The AE plays a central role in the development and implementation of aviation safety activities consistent with the ASMS model. The Accountable Executive must understand their roles and responsibilities associated with ASMS.

National Accountable Executive

In accordance with the Federal Aviation Administration's Advisory Circular (AC) 120-92B, the Deputy Chief, State, Private and Tribal Forestry designates the Accountable Executive for the overall agency Aviation Safety Management System to the Director – Fire and Aviation Management.

Regional Accountable Executive

Each Region should designate an Accountable Executive to act as the final authority over regional ASMS functions and to ensure it is properly supported and managed. The regional AE designated should have direct communication with the National AE (National Fire Director) to ensure ASMS efforts are coordinated.

The Regional Aviation Safety Officers, as the designated safety managers, are the primary contacts for the AE in each region. The RASO is responsible for the development, operation, and continuous improvement of the regional ASMS and is the focal point for safety management issues in the region.

AE Responsibilities: The accountable executive has overall responsibility for safety performance and shall designate resources essential to effectively implement and maintain the ASMS. The responsibilities delegated to the AE are referenced in FAA Advisory Circular (AC) 120-92B, 3-3. Subpart B: Safety Policy, § 5.25 (b), Forest Service Manual 5700, and Forest Service Handbook 5709.16 are:

A. Ensure the Safety Management System is properly implemented.

B. Approve the safety policy and be signatory to the Aviation Safety Management System Guide.

C. Communicate the safety policy.

D. Ensure safety policy remains relevant and appropriate.

E. Regularly review the safety performance and direct actions necessary to improve safety performance.

F. Ensure necessary resources are provided to implement and maintain the ASMS.

The Assistant Director – Aviation and the Branch Chief - Aviation Safety Management Systems are the primary contacts for the AE to implement their responsibilities.

2.4 Key Safety Personnel Accountabilities and Responsibilities

Safety accountabilities and responsibilities are allocated to management and personnel as obligations to fulfill safety related tasks. The allocation of accountabilities and responsibilities must be within the scope of individual employment and management structure of the Forest Service. The following are in reference to ASMS; refer to FSM 5704 for additional information on overall employee aviation-related duties and responsibilities.

A. All Employees

All Forest Service employees shall be responsible for aviation safety and shall take timely action to promote safety. Employees are responsible for conducting their duties in accordance with all agency policies, procedures, and government regulations. To strive for the highest level of safety, all employees are encouraged to report errors, incidents, and accidents swiftly and honestly, without fear of reprisal, or being subjected to punishment for legitimate errors. Employees shall manage risk and mitigate it to the lowest acceptable level.

In addition to responsibilities described in FSM 5704, the following best practices are expected:

Every employee shall identify hazards, assess risk, and mitigate risk to the lowest acceptable level.

Every employee shall initiate appropriate action when an unsafe act or condition is observed. Any employee may stop an unsafe operation or may refuse to participate in an aviation operation when conditions indicate that further activity would jeopardize safety.

Every employee shall report to a supervisor, local aviation officer, or line officer any aviation operation that the employee believes is being conducted in a hazardous manner.

Every employee shall use the SAFECOM system to report any condition, observance, act, maintenance problem, or circumstance that has the potential to cause an aviation or aviation-related mishap. It should also be used for reporting positive safety actions and mishap prevention measures.

Aviation personnel must ensure they are properly qualified for the positions and functions they are assigned to perform.

B. Deputy Director, Aviation and Operations

The Deputy Director Aviation Operations is responsible to the Director, FAM and has the responsibility to request necessary resources. The Deputy Director, Aviation and Operations is responsible to the Director, FAM and will coordinate with the Assistant Director, Aviation. The primary ASMS responsibilities of this position are:

Provide oversight to a national aviation program through leaders' intent and direction.

Provide oversight to a national aviation safety program and accident prevention program.

C. The Assistant Director, Aviation (AD Aviation):

The Assistant Director, Aviation (AD-Aviation) will coordinate with the BC-ASMS to ensure that safety policy and procedures are adhered to with all aviation operations. The AD-Aviation is responsible to the Deputy Director of Aviation and Operations. The primary responsibilities of the AD- Aviation include:

Ensuring that processes needed for the ASMS are established, implemented, and maintained.

Reporting the performance of the ASMS to the organization.

Ensuring the promotion of safety awareness and safety requirements throughout the USFS.

Manage all national aviation programs through leaders' intent and direction. This must include, but is not limited to, aviation planning, budget, policy, operations, aircraft airworthiness, pilot standardization, aviation training, and aviation safety.

Ensure aviation quality assurance across the Forest Service aviation management program.

D. National Aviation Branch Chiefs – Airworthiness, Fixed-Wing, Rotor-Wing, Strategic Planning, Business Operations

Responsible to the AD-Aviation and provides support to the agency ASMS within their respective areas of expertise.

Must coordinate amongst other Branches and with the AD-Aviation on all aviation safety-related matters to assure agency safety goals and objectives are met. Where applicable the BCs must:

Develop and maintain program operational plans that include safety and risk management components.

Facilitate hazard identification and risk management.

Monitor safety concerns in the aviation industry and their perceived impact on USFS operations.

Monitor employee training to ensure employees are receiving training commensurate with assigned duties.

E. Branch Chief, Aviation Safety Management Systems

Reports to the Assistant Director, Aviation.

The BC- ASMS monitors all aspects of the safety system described in this guide, and consults with the Assistant Director, Aviation in all matters regarding safety to promote ASMS and ensure resources are available to accomplish agency aviation operational and safety goals and objectives.

In addition to duties and responsibilities listed in FSM 5704, specific responsibilities of the BC-ASMS are:

Maintain safety documentation; specifically, this guide, to be maintained as a controlled document according to the requirements listed in section 2.9.

Ensure appropriate training for members of Mishap Investigation Teams to meet requirements of 49 CFR 102-33 and agency policy.

Coordinate with the AD-Aviation to assemble Mishap Investigation Teams in a timely manner to respond to aviation mishaps.

Coordinate and lead Aviation Mishap Review Boards.

Develop agency aviation safety goals and objectives.

Annually review the emergency response planning templates for accuracy.

Develop Safety Performance Indicators for safety performance monitoring for WO-FAM.

Receive, evaluate, and process SAFECOMs in accordance with this manual's requirements and recommend action to mitigate risk, when necessary.

Coordinate ASMS activities among the Forest Service, partners, cooperators and contractors and other applicable governmental agencies.

Monitor safety concerns in the aviation industry and their perceived impact on USFS operations.

Ensure coordination with the National Aviation Training Program Manager.

Maintain a National Aviation Safety website to provide virtual electronic resources.

Ensure timely review of the safety components during the annual review of aviation components of agency manuals, handbooks, guides, and plans.

F. National Aviation Safety Officers (ASO)

Reports to the Branch Chief, Aviation Safety Management Systems.

Conduct Aviation Mishap Investigations.

Maintain aviation course instructor qualifications for training delivery.

Provide aviation safety assistance to regions, forests and units.

Maintain ICAP safety officer qualifications.

Complete a variety of ASMS tasks to meet agency aviation safety goals and objectives.

G. Forest Health, National Aviation Program Manager (FHP, NAPM)

Under the Director of Forest Health Protection, State, Private, and Tribal Forestry, Washington Office, the Forest Health Protection National Aviation Program Manager (FHP NAPM) is

responsible for coordinating with the National Aviation Safety Branch or Regional Aviation Safety Officer in aviation safety matters for Agency and cooperators conducting FHP aviation activities. The NAPM is responsible for fostering and promoting a positive safety culture through incorporating the elements of ASMS into all FHP aviation operations.

H. Regional Aviation Officers (RAO)

Regional Aviation Officers are responsible for fostering and promoting a positive safety culture and incorporating ASMS into Regional aviation operations. Responsibilities include:

Coordination with the Regional Aviation Safety Officer (RASO) and FHP NAPM on aviation safety and mishap prevention matters.

Ensuring compliance with aviation safety policies and procedures,

Participating in safety assurance processes,

Promoting ASMS through training and awareness, and

Applying risk management processes.

I. Regional Aviation Safety Officer (RASO)

Regional Aviation Safety Officers foster a safety culture through the development of informed, flexible, reporting, learning, and just cultures to establish and maintain a high reliability organization.

The RASO maintains ICAP qualifications and has the skills, knowledge, and experience to lead their respective region in establishing and implementing ASMS.

Each Region will ensure that a qualified RASO is a key position on the organizational chart and will ensure recruiting and hiring such individuals is a high priority.

The RASO shall not report to the RAO to ensure safety duties remain independent and do not conflict with operational duties.

J. RASO Responsibilities

Safety oversight must be performed independently of aviation operations to avoid conflicts of interest. These key aviation positions are responsible for implementation, fostering and promoting ASMS. In addition to responsibilities found in 5704.34C and D, RASO responsibilities for ASMS include:

Policy

- Providing input in aviation safety policy development.
- Preparing the Regional supplement to the National Aviation Safety and Management Plan and reviewing Forest/Unit supplements to that plan, including Mission Aviation Safety Plans (MASPs).
- Assist in the development of local standard operating procedures.
- Foster and promote aviation safety management systems as a core value within the Region.

Risk Management

- Provide oversight and guidance on safety risk management processes.
- Conduct risk management for regional aviation programs.
- Support the National aviation risk management efforts (Strategic Risk Assessments, Change Management, etc.).

Assurance

- Participate in or lead aviation safety oversight in the Region through reviews and functional site visits.
- Coordinate or participate in audits, reviews, and assessments both internal and external.
- Monitor established standards and procedures and make recommendations.
- Monitor Regional mishap trends, and implement preventative action as needed.
- Report all aviation mishaps in accordance with agency policy and the local emergency response plan.
- Support mishap investigations conducted by the Safety Branch.
- Provide guidance, coordination, and monitoring of safety evaluations conducted by the regional aviation staff and Forest/Unit Aviation Officers.
- Ensure best practices and procedures are understood and utilized in the region.
- Manage SAFECOM reports in a timely manner, ensuring proper sanitation of sensitive information or PII, prior to making the reports public, preferably within 7 days of receiving the initial report. The RASO is responsible for the final review and publication of SAFECOMs in their region.
- Monitor and develop trend analysis from the SAFECOM system and communicate lessons learned/trends.

Promotion

- Coordinate and monitor aviation safety training within the region/unit to ensure personnel are properly trained to perform duties and to promote a learning culture.
- Communicate aviation safety information to all levels of the organization in a timely manner.
- Encourage the reporting of hazards and safety concerns in SAFECOM, developing and distributing lessons learned, providing subject matter expertise, and distributing safety alerts and bulletins, etc., through regional mailing lists.
- Communicate and coordinate with cooperators, interagency partners, and subject matter experts (SMEs) as needed.
- Recognize positive safety behavior and proactive reporting through an Aviation Award program.

K. FHP NAPM (See RASO Responsibilities and 5704.34C and D)

L. National Aviation Safety Council

The National Aviation Safety Council (NASC) is a critical part of the agency ASMS, and shall be continually used as a resource, providing expert advice and counsel to facilitate the aviation safety management system implementation process. The NASC conducts business according to the approved NASC Charter.

M. All Other Aviation managers

Managers' safety responsibilities involve the supervision of employees, and the provision of resources for those employees to safely carry out their assigned duties. Managers are responsible for integrating ASMS activities into their assigned duties and responsibilities. They must:

Monitor conditions to ensure that safe operation of agency aircraft.

Actively support the ASMS.

Ensure assigned employees are trained and actively participating in the ASMS.

Actively identify and assess the agency's risk exposure.

2.5 Emergency Preparedness and Response

The NWCG Aviation Mishap Response Guide and Checklist (PMS 503) standardizes the information and formatting for local aviation mishap response. It is not intended to be all-encompassing but provides the minimum essential elements that apply to search and rescue, reporting and notification processes associated with most aviation mishaps. All Forest Service Regions/Units using or managing aviation resources must establish their own Emergency Response Plan (ERP) which contains the elements necessary for effective aircraft mishap, search, and rescue response. The ERP should include:

Mishap Notification procedures and checklist.

Roles and Responsibilities.

Coordination and planning for the response to aviation accidents and incidents.

Schedule or plan to execute annual exercises to verify the contents and procedures associated with the mishap response plan and checklist.

A schedule or plan for training of individuals with a role in the Mishap Response plan.

A revision log showing annual review and updates.

2.6 Documentation

Documentation provides official information, record, or evidence to substantiate the agency's aviation safety management system (ASMS). Documentation includes information about all activities executed by the agency to, guide, implement, communicate, manage, monitor, or improve the ASMS. A well-functioning documentation process contributes to proper and adequate retention of records supporting agency aviation safety goals.

Documentation is an integral part of the ASMS ensuring the knowledge obtained about ASMS performance, hazards, threats, risks, etc., can be recorded over time. Information can be analyzed and applied to make informed decisions and show improvement in a tangible, measurable way. Documentation also allows safety information to be viewed collectively to detect cumulative hazards or trends that may exist between different elements in the system that are otherwise undetectable from a single source of information.

A. **Guidance**: Consists of documents that guide the agency's safety effort: policy, guides, plans and strategies and other documents that help achieve safety objectives. This includes:

   FSM 5700; FSH 5706.16

   41 CFR 102-33 Management of Federal Aircraft

   National Aviation Safety Management System Guide (NASMSG) (This Guide)

   National Aviation Safety Management Plan (NASMP) - tiered management plans ensuring National, Regional and Unit/Forest Aviation Management Plans are consistent.

   Forest Service Aviation Strategic Plan

   Forest Service Aviation Mishap Investigation Guide (AMIG)

   NWCG Standards for Aviation Risk Management (PMS 530 and 530-1)

   Forest Service Change Management Guide

B. **Implementation**: Enables execution of safety procedures and achievement of the organization's safety objectives. Examples are:

Documentation of decisions – briefing papers, formal and informal letters, signed policy, etc.

Documentation of milestones achieved (ASMS Implementation Plan)

C. **Communication**: Provides information about aviation safety management functions and activities within the organization. These can consist of records demonstrating promotion of aviation safety best practices, lessons learned from accidents and incidents, safety awards, etc. Examples are:

Annual Aviation Safety Summary

Airward Report

Alerts, Bulletins, Lessons Learned

Briefing Papers

Mishap Investigation Reports

National Aviation Safety Council (NASC) meeting minutes, decision memos, etc.

Accident reporting to General Services Administration (GSA).

Safety committee meeting activities (agendas, minutes, resulting actions, etc.)

SAFECOMs

D. **Management**: Safety records to demonstrate that the ASMS is being managed and operated according to applicable laws, regulations, policies, guides, and plans. Examples are:

Audit/Review reports, findings, and action plans

Mission Aviation Safety Plans (MASPs)

Aviation Mishap Review Boards and Safety Action Plans

Federal Requirement for Federal Aviation for Interactive Reporting System (FAIRS).

SAFECOM administration

E. **Monitor Performance**: Provides for progress checks on the agency ASMS. ASMS functions and activities should be measured or tracked to monitor accomplishment of goals and objectives and to identify needs. Examples are:

Audits, reviews, functional site visits

Safety surveys

Hazard tracking, trending, and monitoring (SAFECOM)

Aviation Safety Statistics

Safety Metrics and Safety Scorecard (Key/Safety Performance Indicators K/SPIs)

F. **Improvement**: Records the ASMS outputs and evidence of results achieved, or activities performed. Examples are:

Safety Performance Indicators – development and tracking; report card; annual report

Mishap Recommendations and Action Plans implemented.

Change Management Plans

Programmatic Risk Assessments

G. **Documentation Control Procedures:** Managing and operating a ASMS generates a significant amount of information. A disciplined approach to documentation management and control is essential. Documentation must be:

Available to all employees (unless pre-decisional, classified or otherwise protected)

Updated frequently (each guide must have a revision log and an update cycle)

Recorded, managed, and stored in accordance with agency records management requirements: DR 3080-001- Records Management; FSH 6209.11 Records Management Handbook

Removed from usage or secured otherwise against unintended use when such information becomes obsolete or outdated.

2.7 GSA Gold Standard

The Forest Service will maintain the Gold Standard by documenting the agency's commitment and adherence to Federal Management Regulations (FMR 102-33). The GSA Interagency Committee on Aviation Policy (ICAP) Federal Aviation "Gold Standard" Program is a voluntary, self-certification program whereby the ICAP recognizes those agencies that have made the commitment to Federal aviation safety by implementing and actively supporting the ICAP Safety Standards Agreement, the Guidelines, and/or adhering to the FMR Part 102-33. Adherence to the FMR Part 102-33 will serve as a prerequisite for the issuance of an ICAP Federal Aviation "Gold Standard" Program recognition certificate (refer to FSH 5709.16 CH 23.51).

Chapter 3. Safety Risk Management (SRM)

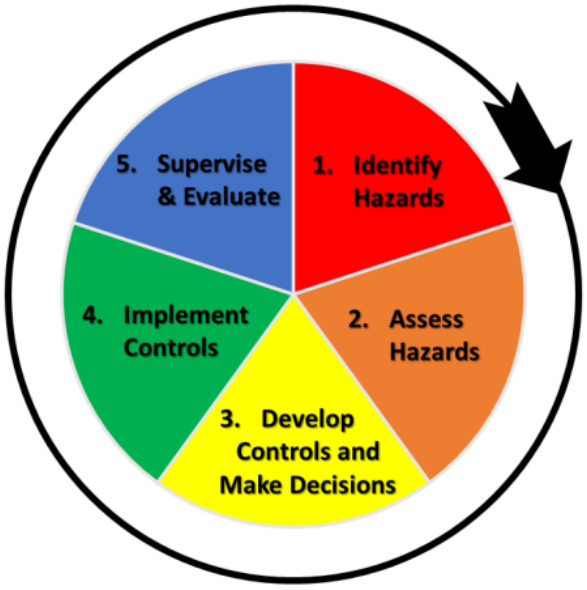
Risk is an expression of the impact of an undesired event in terms of event severity and event likelihood. Throughout the risk management process, hazards are identified, risks analyzed, assessed, prioritized, and results documented for decision-making. The continuous loop process provides for validation of decisions and evaluation for desired results and/or the need for further action. The goal for risk management is not to eliminate all risk, but to manage those risks that cannot be eliminated so the mission can be accomplished with minimum negative impact. Risk management is a robust component of the Agency's ASMS and shall occur throughout Agency aviation operations.

Hazard identification is vital. A hazard is anything that could lead to an aircraft accident. Unless you know what hazards are out there, you cannot identify the risks they pose. And if you do not know what the risks are, you cannot do anything about them.

Best Practice: The organization should continuously identify hazards and understands its biggest risks and is actively managing them; this can be seen in their safety performance. Safety Risk Management is proactive.

A. SRM Process

The process described in the NWCG Standards for Aviation Risk Management establishes a common reference for terms, processes, and tools utilized in applying Risk Management to aviation operations. Risk Management is a systems-oriented process for identifying and controlling hazards across the full spectrum of missions, functions, operations, and activities conducted to meet organizational goals.



B. Description

Identify hazards.

Review what internal and external sources of hazards are considered such as safety reports (SAFECOM), audits, safety surveys, investigations, inspections, brainstorming, management of change activities, commercial and other external influences, etc. Consider other Possible accident scenarios, Human and organizational factors, Business decisions and processes, Third party organizations, Regulatory factors.

Assess the hazards.

This step involves the application of quantitative and/or qualitative analysis methods to determine the probability and severity of consequences that may result from exposure to hazards and directly affect mission or activity success.

Develop Controls and make decisions.

Step three involves the evaluation of specific strategies and controls that reduce or eliminate hazards. Effective mitigation measures reduce one of the three components (probability, severity, or exposure) of risk. Risk mitigation decisions must be made at the appropriate level for the identified risk.

Implement Controls

After selecting control measures, develop, and carry out an implementation strategy. The strategy must identify the who, what, when, where, and cost(s) associated with the control measure. For mission related controls, emphasize accountability across all levels of leadership and personnel associated with the action so that there is clear understanding of the risks and responsibilities. There must always be accountability for acceptance of risk regardless of circumstances.

Supervise and evaluate.

Once controls are in place, the process must be evaluated and reviewed to ensure controls remain effective and mission-supportive over time.

Descriptions have been established for likelihood and severity levels (described in Section 3.5.6) to include authority for safety risk acceptance decisions. These risk decisions may apply in the short-term while safety risk controls/mitigation plans are developed and executed. Operational Risk Management (ORM) is a process designed to detect, assess, and control risk while at the same time enhance mission performance.

The process for completing operational risk management can also be found in the NWCG Incident Response Pocket Guide (IRPG), the Interagency Standards for Fire and Fire Aviation Operations (Red Book), or the NWCG Standards for Helicopter Operations .

3.2 Safety Risk Management Levels

A. Time Critical.

This method of risk management is an “on-the-run” mental or verbal review of the situation using an Operational Risk Management (**ORM**) process without necessarily recording the information. Many of the skills used in this context are applicable to normal mission where deliberate risk management has occurred and crews must manage risk in a dynamic situation. Note that “Time Critical” does not mean “hasty” or “uninformed.”

B. Deliberate.

This Risk Management (**RM)** method is used with adequate planning time and may involve more than one system at its source. It involves a systems identification, hazard identification, risk

assessment/analysis, consideration of control options and risk decision making, implementation of controls, and supervision. This will involve documentation of the process and actions. Examples of the tools in use for deliberate RM are the risk assessments developed as a component of a mission aviation safety plan (MASP), incident risk assessment (ICS Form 215A) or a job hazard analysis (JHA).

C. Strategic

Strategic Risk Management is conducted at the highest levels of the organization and is typically applied to "systems of systems" type complexity and requires more sophisticated techniques and professional reviews. A system or task description should completely explain the interactions among the software, hardware, environment, live ware that make up the system in sufficient detail to identify hazards and perform risk analysis. An example product of the strategic risk assessment process is a Safety Impact Analysis.

Strategic risk assessments should be used in instances where an entire program- wide assessment is deemed necessary; new technology or a change in process is being proposed; or when risks appear consistently high in a specific functional area. The strategic process produces a permanent record of findings and decisions used for long term planning, organizational decision-making, and as authoritative training resources. Strategic risk assessments undergo a Strategic Risk Assessment Close-Out (SRACO) process (refer to FSH 5709.16 Chapter 10).

Note:	**The Strategic Risk Management process shall not preclude employees or contractors from taking interim immediate action to eliminate or mitigate existing safety risk when and where it is recognized, and that urgent action is required.**

3.3 Hazard Identification Methods

A. **Reactive hazard identification methods** - hazards are recognized through trend monitoring and investigation of safety occurrences. Incidents and accidents are clear indicators of systems' deficiencies and should be therefore investigated to determine the hazards that played role in that event.

B. **Proactive hazard identification methods** - hazards are identified analyzing systems' performance and functions for intrinsic threats and potential failures. The most applied proactive methods are the safety surveys, operational safety audits, safety monitoring and safety assessments. Other methods, such as Flight Operational Quality Assurance (FOQA), specifically designed to track normal operations (trends), and Line Operations Safety Audit (LOSA) and Normal Operations Safety Survey (NOSS) designed to capture real life strategies (i.e., human performance), play an important role in proactive hazard identification.

3.4 Program-wide Risk Assessment

Safety risk management examines system design and function as a strategic process. That means looking at what we do and how we do it. A program-wide risk assessment shall be proactively carried out to facilitate the anticipated changes in programs. Program-wide risk assessment will consider the following, at a minimum:

A. Any interactions with other systems in the air transportation system (e.g., airports, airspace, UAS).

B. The functions described in section 0 of this manual.

C. Employee tasks required to accomplish the functions in section 0 of this manual.

D. Required human factors considerations of the system (e.g., cognitive, ergonomic, environmental, occupational health and safety) for operations and maintenance.

E. Hardware components of the system.

F. Software components of the system.

G. Related procedures that define guidance for the operation and use of the system.

H. Training requirements (existing and potential).

I. Ambient environment and cost/benefit analysis of mitigations.

J. Operational environment and assessment of quality of the program.

K. Maintenance environment.

L. Contracted and purchased products and services.

M. The interactions between items or issues defined in the list above.

N. Any assumptions made about the systems, system interactions, and existing safety risk controls/mitigation.

3.5 Management Required Action

An action plan is required as the implementation tool for strategic and deliberate program risk assessments. The Branch Chief of Aviation Safety Management is assigned the overall responsibility of the completion of the management action plan. Each responsible manager is required to continually evaluate the systems and processes under their cognizance, measure performance, identify hazards, and assess related risk. Examining the probable threats and areas of common errors in these systems and processes will provide increased clarity into the hazards affecting aviation operations.

Risk management processes may need to be altered to meet constraints imposed by time, equipment, and/ or operational needs. The process by which risk is managed is cyclic and works in a continuous loop of events that continue throughout the mission and should be applied throughout the entire operation from planning through execution to the evaluation phase.

3.6 Management of Change

The purpose of Change Management is to provide the U.S. Forest Service's Aviation Program's with a structured way to approach planning and implementing change.

The following items **shall not** be implemented until the associated risks of each is determined to be acceptable using the risk assessment procedures contained in this manual and the Change Management and Implementation Guide:

A. New system designs.

B. Changes to existing system designs.

C. New operations/procedures

D. Modified operations/procedures.

The Change Management and Implementation Guide 2016 is found:
https://www.fs.usda.gov/sites/default/files/2019-06/change_management_guide_2016.pdf

3.7 Hazard Identification

A. Identify Hazards and Consequences

- Potential hazards may be identified from several internal and external sources. Hazard scenarios may address the following: who, what, where, when, why, and how, regarding the hazard that is causing concern, as well as its potential consequences. This provides an intermediate product that expresses the condition and the consequences that will be used during risk analysis.
- Hazards shall be identified for the entire scope of the system that is being evaluated, as defined in the system description, and documented using the hazard reporting form.
- Once a hazard has been identified and documented, the information shall be tracked and managed as described in the procedures following.

B. Hazard Identification Requirements and Procedures

To formalize the hazard identification process, the following requirements are established:

- System and process hazards as described in section 3.1 will be proactively identified and communicated through ASMS activities by all managers.
- All employees are responsible for continued vigilance to identify hazards they observe or experience via the performance of their duties.
- SAFECOM reports will be used to increase communication and awareness of potential hazards.

3.8 Hazard Reporting and Management

For a hazard reporting program to be effective hazard reports must be processed efficiently and effectively:

A. Aviation managers at all levels are responsible for analyzing and trending hazard information.

B. Applicable subject matter experts will be involved in analyzing identified hazards.

C. BC-ASMS shall synthesize hazards reported to elevate potential serious aviation hazards as appropriate both internal and externally.

D. The BC-ASMS in conjunction with the NASC may authorize special studies and risk assessments of hazards as needed to increase awareness and develop risk mitigations for various hazardous activities.

E. RASO will track hazard reports, assign appropriate risk prioritization, and provide dissemination to the field users.

F. RASO will utilize a hazard log. Review Appendix 2.4, on page 68.

G. Personnel responsible for the reporting system will ensure the program is not used for punitive action and will safeguard information from unauthorized release.

3.9 Safety Risk Management Procedures

Safety risk management is the core component of the ASMS. Mitigation of the safety risks is intended to reduce the consequences of hazards to a level as low as reasonably practicable (ALARP). The significant concepts regarding safety risk management discussed throughout this section can be summarized as follows:

A. There is no such thing as absolute safety — in aviation it is not possible to eliminate all safety risks.

B. Safety risks must be managed to a level “as low as reasonably practicable” (ALARP).

C. Safety risk mitigation must be balanced against:

- Time.

- Cost.
- The difficulty of taking measures to reduce or eliminate the safety risk (i.e., managed).

A key part of the safety risk management process is the involvement of employees who will be affected by a decision; their expertise is often critical to decision making. The benefits to using this decision process include:

D. Avoiding costly losses in the decision-making process.

E. Ensuring that all aspects of the risk problem are identified and considered when making decisions.

F. Ensuring legitimate interests are considered.

G. Providing the decision makers with tools to make good decisions.

H. Making decisions easier to explain.

I. Providing a standardized set of terminology used to describe risk issues contributing to better communication about risk issues.

J. Providing significant savings in time and money.

3.10 Organizational Decision Making

Employees must assure operations are conducted within the limits of the agency's level of acceptable risk. Exercising judgment on how to eliminate or reduce hazards to lessen the overall risk is inherent in the risk assessment process. These basic decision-making principles must be applied before any anticipated job, tasks, or mission is performed:

A. **Accept no unnecessary risk**. Unnecessary risk contributes no benefits to the safe accomplishment of a task or mission. The most logical choices for accomplishing a mission are those that meet all the mission requirements while exposing personnel and resources to the lowest possible risk.

B. **Make risk decisions at the appropriate level**. Making risk decisions at the appropriate level establishes clear accountability. Those accountable for the success or failure of a mission must be included in the risk decision process. Supervisors at all levels must ensure subordinates know how much risk they can accept and when they must elevate the decision to a higher level.

C. **Recognize when benefit outweighs risk.** Weighing risks against opportunities and benefits helps to maximize unit capability. Even high-risk endeavors may be undertaken when there is clear understanding of the benefit to the agency. Recognize and act upon extreme risk situations with a NO – GO decision.

3.11 Risk Assessment Matrix

RISK ASSESSMENT MATRIX			PROBABILITY				
			Likelihood of Mishap if Hazard is Present				
			Almost Certain (Continuously experienced)	**Likely** (Will occur frequently)	**Possible** (Will occur several times)	**Unlikely** (Improbable; but has occurred in the past)	**Rare** (Remotely possible; but highly improbable)
SEVERITY	Consequence if Mishap Occurs	**Catastrophic** (Death, Loss of Asset, or Mission Capability, or Unit Readiness)	**Extremely High**	**Extremely High**	**Extremely High**	**High**	**Medium**
		Critical (Permanent Disabling Injury or Damage, Significantly Degraded Mission Capability or Unit Readiness)	**Extremely High**	**Extremely High**	**High**	**Medium**	**Medium**
		Moderate (Non-Permanent Disabling Injury or Damage, Degraded Mission Capability, or Unit Readiness)	**High**	**High**	**Medium**	**Low**	**Low**
		Negligible (Minimal Injury or Damage, Little, or No Impact to Mission Capability or Unit Readiness)	**Medium**	**Medium**	**Low**	**Low**	**Low**
			Risk Assessment Codes (RAC)				
			Extremely High=1, High=2, Medium=3, Low=4				

3.12 Safety Risk Probability

Safety risk probability is defined as the likelihood that an unsafe event or condition might occur during operations. This probability of occurrence is based on analysis considering the following:

A. Is there a history of similar occurrences to the one under consideration, or is this an isolated occurrence? Occurrences across aviation will be considered, as applicable.

B. What other equipment or components of the same type might have similar defects?

C. How many personnel are following, or are subject to, the procedures in question? and

D. What percentage of the time is the suspect equipment or the questionable procedure in use?

3.13 Likelihood Scale Definitions

The following shall be used to standardize the assignment of probability:

Likelihood	Definition
Almost Certain	Continuously experienced
Likely	Will occur frequently
Possible	Will occur several times
Unlikely	Improbable; but has occurred in the past
Rare	Remotely possible; but highly improbable

3.14 Safety Risk Severity

Safety risk severity is defined as the possible consequences of an unsafe event or condition, taking as reference the worst foreseeable situation. The assessment of the severity of the consequences can be determined by asking:

A. How many fatalities or injuries may occur (employees, passengers, and the public)?

B. What is the extent of property or financial damage (direct property loss to the operator, damage to aviation infrastructure, third-party collateral damage)?

C. What is the environmental impact (spillage of fuel or other hazardous product, and physical disruption of the natural habitat)?

D. What are the political implications, reputation, and/or media interest?

3.15 Severity Scale Definitions

Based on these considerations, use the following risk severity table:

Risk Severity	Consequence
Catastrophic	Death, Loss of Asset, or Mission Capability, or Unit Readiness
Critical	Permanent Disabling Injury or Damage, Significantly Degraded Mission Capability or Unit Readiness)
Moderate	Non-Permanent Disabling Injury or Damage, Degraded Mission Capability, or Unit Readiness
Negligible	Minimal Injury or Damage, Little, or No Impact to Mission Capability or Unit Readiness

3.16 Safety Risk Tolerance

Once the level of risk has been determined, in terms of probability and severity, the next step in the process of bringing the safety risks under organizational control is the assessment of the tolerability of the consequences. This is known as assessing safety risk tolerability.

Obtain an overall assessment of the safety risk by combining the safety risk probability and safety risk severity tables into a safety risk assessment matrix.

Descriptions of the Risk Levels are depicted below.

3.17 Risk Level

RAC Value	Risk Category	Action Required
1	Extremely High	Stop, Mitigation Required
2	High	Mitigation Needed, Consider Stopping
3	Medium	Mitigation Recommended
4	Low	Possible Acceptance, Mitigation Optional

3.18 Risk Tolerability Protocol, Line Authorities and Controls

For each level of risk, Low, Medium, High, Extremely High there is a generally accepted protocol for management to accept responsibility and be accountable for resulting risks. The following protocols are recommended but may be adjusted accordingly for application at any level, during the risk management planning process. If the process shows an unacceptable level of risk, then mitigation to an acceptable level is required or the decision must be made at the appropriate level. The table below provides examples of how to appropriately assess levels for risk decisions. These risk decisions are documented through a Risk Tolerability Decision Matrix.

3.19 Safety Risk Control and Mitigation

While the risks inherent throughout aviation operations will be continually assessed, experts within the agency can implement risk control measures designed to reduce or eliminate the assessed risk. There are three generic strategies for safety risk control/mitigation:

A. **Elimination**. The operation or activity is cancelled because safety risks exceed the benefits of continuing the operation or activity. An example of an elimination strategy: Operation into a helispot surrounded by complex geography is cancelled.

B. **Reduction**. The frequency of the operation or activity is reduced, or action is taken to reduce the magnitude of the consequences of the accepted risks. An example of a mitigation strategy: helicopter operation into a helispot surrounded by mountainous terrain is limited to daytime, visual conditions.

C. **Segregation**. Action is taken to isolate the effects of the consequences of the safety risk or build in redundancy to protect against them.

D. **Residual risk exposure**. Action is taken to isolate the effects of the consequences of the hazard or build in redundancy to protect against them via mitigation. The remaining risk is evaluated and determined to be acceptable or requiring additional mitigation.

Residual risk shall be evaluated after creation of safety risk controls/mitigations. An example of a strategy based on residual risk exposure:

Operation into a helispot surrounded by mountainous terrain.

The secondary evaluation of residual risk may determine that employed controls are not adequate. In this circumstance, additional controls or modification is necessary to bring the risk to as low as reasonably practical.

Subsequently the mission is limited to aircraft with specific performance capabilities and flight crews carded for specific mountain/back country experience in addition to daytime, visual conditions limitations.

3.20 Risk Assessment Documentation Procedures

To formalize risk management documentation, the following requirements are established for aviation operations:

A. Risk assessment documentation will be managed in accordance with agency/unit Aviation Safety and Management Plans.

B. Strategic and deliberate risk assessments shall be documented in accordance with the procedures set forth in this Guide.

C. Controls shall be monitored using the risk assessment worksheet and action plan as documentation.

D. Program Risk Assessments shall be maintained indefinitely in the NWCG Aviation Risk Management Workbook, PMS 530-1 and as needed at the Region level.

E. A hazard log shall be kept. The nature and format of such a log may vary from a simple list of hazards to a more sophisticated relational database linking hazards to mitigations, responsibilities, and actions (as part of an integrated safety risk management process) to purpose created ASMS Management software. All identified hazards should be assigned a hazard number and be recorded in a hazard log. The hazard log should contain a description of each hazard, its consequences, the assessed likelihood, and severity of the safety risks of the consequences, and required safety risk controls, most usually, mitigation measures. The hazard log should be updated as new hazards are identified and proposals for further safety risk controls (i.e., further mitigation measures) are introduced.

Best Practice The organization has a log of the hazards that is maintained and reviewed to ensure it remains up-to date. It is continuously and proactively identifying hazards related to its activities and the operational environment and involves all key personnel and appropriate stakeholders including external organizations. Hazards are continuously assessed in a systematic and timely manner. Safety investigations identify causal/contributing factors that are acted upon.

3.21 Agency Risk Profile

Capturing the prominent risks faced by the agency and evaluating the controls employed to eliminate or mitigate those risks is the objective of the agency risk profile. The agency risk profile is determined by reviewing the Aviation Risk Management Workbook. The following requirements are established to formalize risk profile development and documentation:

A. The risk profile will be used to document and track prominent risk exposure. This documentation may be found in the Risk Assessment Workbooks or on the Aviation Safety Center website: https://www.nwcg.gov/publications/pms530-1

B. The risk systems tracked are Aircraft, Operations, Aircraft Maintenance, Facilities, Human Factors, and others when deemed appropriate by the BC- ASMS.

C. Additional local hazards and mitigations will be identified and documented using the Aviation Risk Assessment Workbook.

D. A separate QA process will assure risk management of the specific mitigations and action plans that are tracked.

E. The profile will be reviewed annually and updated as needed to include feedback from completed quality assurance efforts.

F. The BC-ASMS is responsible for maintaining the agency Risk Profile; Historical profiles will be maintained by the BC-ASMS.

G. All programs that utilize aircraft in support of their mission are required to conduct program risk assessments that contribute to the development of the agency risk profile (e.g., Fire, Law Enforcement, Research, Forest Health, etc.).

3.22 Mission Aviation Safety Plan

Mission Aviation Safety Plans (MASP) can be a bridge between the Aviation Risk Profile and the unique operational aspects of a specific non-emergency operations. This is another opportunity to provide historical hazard identification from previous missions as well as predictive hazard identification based on a conceived specific mission factors and elements. The MASP can serve to provide a mission with SRM process and additional mitigations.

MASPs are required by FSM 5700 prior to commencing all non-emergency aircraft operations, or aircraft operations outside the scope of an approved training or operational plan. MASPs are not required for incident aviation operations or administrative use flights. Regional Directors, Forest Supervisors, and Station Directors shall develop and document a MASP that will be reviewed by the RAO and RASO. An appropriate line officer shall approve all Aviation Plans per direction in FSM 5700. Refer to FSH 5709.16 Chapter 10 for elements required in the MASP.

3.23 Flight Risk Analysis Tool (FRAT)

Every flight has hazards and some level of risk associated with it. It is critical that management and pilots can differentiate, in advance, between a low-risk flight and a high-risk flight that allows pilots, managers, and dispatchers to see the risk profile of a flight in its planning stages and manage risks proactively. Using a FRAT will provide an overall risk assessment score for the flight and profile for each phase of flight. The most relevant hazard and risk concerns will become obvious and will have a document to compare to the acceptable level of risk.

When the risk for a flight exceeds the defined acceptable level, the flight will be further evaluated, and risk decisions made by appropriate leadership. Just like other forms or levels of risk management, the FRAT should be documented and reviewed for additional identified risks and mitigation. This should be incorporated into the hazard collection. The FRAT should not be static but should reflect actual hazards likely to be encountered during the flight.

Time-critical operational risk management will be used for decision making, to assess and track prominent risk exposure as specifically pertaining to individual flights.

The FRAT Tool should be tailored to mission and be proactively examining the flights risks. All aspects should be considered including pilot, crew, weather, mission, and external pressures. There are many models that can help identify hazards.

A FRAT must be completed at a minimum, prior to the first flight of the day and any time significant changes occur that may affect the flight. A FRAT will be reviewed by all mission participants. FRATs will be retained after mission use and archived by the Unit(s) for documentation and quality assurance (5709.16 Chapter 20).

Chapter 4. Safety Assurance

The main purposes of Safety Assurance (SA) are to ensure risk controls are properly implemented throughout the aviation organization, are effective as intended, and do not create unintended consequences or new hazards. A related purpose of SA is to monitor the aviation programs systems to detect the presence of new hazards, whether they are generated internally or externally to the organization.

SA checks the performance of the system, processes, and procedures on a routine basis to determine the performance and effectiveness of safety risk controls. This is achieved through the gathering and analysis of data. The tools used to gather this data include Operational data (gathering and analysis), internal audits and evaluations, external audits, investigations, and voluntary/mandatory reporting.

4.1 Operational Data

There are numerous sources of operational data that should be considered in evaluating performance and effectiveness of risk controls. These include but aren't limited to:

- Flight Data Monitoring (FDM)
- Flight Operational Quality Assurance (FOQA)
- Safety Performance Indicators (SPIs)
- SAFECOM
- Safety audits
- Safety surveys
- Synthesized data from Subject Matter Experts in other organizational areas (Airworthiness, Ops, Training, etc.)

Data from these sources should be evaluated on a regular basis, individually or in conglomerate, with appropriate safety analysis completed to spot trends and other risk precursors before they create problems in aviation operations.

A. Flight Data Monitoring (FDM)

Flight Data Monitoring (FDM) systems make it infinitely easy to collect and allow aircrews to monitor information in real time and review it more carefully either in an after action or at other pre-determined intervals. The FDM dataset can include anything from a simple smartphone-generated flight track to a complete avionics record that provides everything from engine parameters to control surface deflections. The capability offered with many modern Original Equipment Manufacturer (OEM), or after-market avionics systems can be useful both for piloting and monitoring the health and well-being of an aircraft.

By comparing actual performance with determined ideal values, specific areas can be pinpointed for improvement. In training, those in instructor or evaluator roles can use FDM readouts to make debriefs more interactive and accurate, as well as to identify areas for additional explanation, practice, or emphasis. FDM can also provide extremely helpful data on the health and well-being of an aircraft. With FDM numerous parameters from various points throughout any flight can be analyzed. This analysis can identify various readings and trends, and plot key parameters in a time series over multiple flights or years of flights. This kind of information can save money, and it can give aircraft maintenance and airworthiness a head-start on identifying and fixing issues. Less trial-and-

error translates to less time, effort and money wasted. Information is a powerful tool. FDM can help identify ways to improve aviation operations as well as the mechanical condition of aircraft.

B. Flight Operations Quality Assurance (FOQA)

In recent years, the Federal Aviation Administration (FAA), the air transportation industry, and other professional aviation industry operations have sought additional means for addressing safety problems and identifying potential safety hazards. Based on the experiences of these entities, the results of several FAA-sponsored studies, and input received from government/industry safety forums, it has been concluded that wide implementation of Flight Operational Quality Assurance (FOQA) programs could have significant potential to reduce aviation accident rates below current levels. The value of FOQA programs is the early identification of adverse safety trends that, if uncorrected, could lead to accidents. A key element in FOQA is the application of corrective action and follow-up to assure that unsafe conditions are effectively remediated.

As of the development of this guide, the Forest Service is in the process of formalizing development, implementation, and operation of a FOQA program. This program is being designed to make aviation operations safer by allowing agency aviation operators as well as contracted aviation services to share de-identified aggregate information to monitor national, regional, or local trends in aircraft operations and target resources to address operational risk issues.

Captured aggregate data will be kept confidential and the identity of reporting personnel or organizations will remain anonymous as allowed by law. Information submitted pursuant to this program will be protected as "voluntarily submitted safety related data" under Title 14 of the Code of Federal Regulations (14 CFR) part 193.

FOQA programs include provisions for the identification of safety issues and development and implementation of corrective actions. FOQA can provide objective safety information that is not otherwise obtainable.

Safety Performance Indicators (SPIs)

SPIs are a health check for organizational safety management programs and help the agency target where it may be drifting from standards and processes that have been established to mitigate risk in aviation operations.

When determining what to monitor using SPIs, it is suggested that known safety risks, parameters that may help detect emerging safety risks, and data that show the effectiveness of an organization's risk controls should be the focus. SPIs need to consider the organization's risk tolerance, the cost and/or benefits of implementing improvements, regulatory requirements, and public expectations.

There are two types of indicators: leading and lagging. Leading indicators are proactive or predictive and can be either negative (which involves measuring things with the potential to create a negative outcome) or positive, (which means measuring things that contribute to safety in a positive way). Lagging indicators are reactive in that they measure events that have already occurred (particularly events with negative outcomes, i.e., accidents), as well as lower-level failures or events that did not result in a serious outcome (i.e., Incidents).

SPIs should be well-defined, quantifiable, connected to accident probability and important to achieving safety goals. In addition, SPIs should be developed for all areas of an aviation operation.

Note:	**Each region should develop SPIs that are meaningful and important to achieving Safety Goals.**

Once the SPIs are set, they should be periodically reviewed to determine if the organization's safety efforts are trending in the right direction. If not, SPIs can be used to identify potential problem areas for further study and correction. Avoid the following pitfalls when developing SPIs: measuring things that are easy to measure or unimportant; only focusing on one area of an operation; not communicating the SPIs to the organization; and failing to review SPIs frequently enough or to update them on a regular basis.

C. Safety Surveys

A Safety Survey is a tool available to provide systematic review, recommend improvements where needed, provide assurance of the safety of current activities, and to confirm conformance with applicable parts of the safety management system. As aviation organizations become more interested in understanding safety culture and how it can be improved, safety surveys will be utilized more as an option to gather this data.

Safety culture can be defined as "the enduring value and priority placed on worker and public safety by everyone in every group at every level of an organization."[3] Different versions of survey can be used within the same organization, when designed to reflect the same structure across different operational area but using terminology and describing behavior appropriate to the specific function. These surveys can create an accurate picture for leaders at different levels (National, regional, local) of current safety culture across an entire organization, or within specific operational areas of an organization (operations, airworthiness, standardization, etc.). For more information on the potential use of safety surveys as a tool to measure safety culture, contact the BC-ASMS.

4.2 Internal Audits and Evaluations

A. Internal Audits

In a positive safety culture, safety responsibility is shared across the organization. If everyone has this sense of shared safety responsibility, they will want to check their own work areas to find problems before they result in a mishap. This is accomplished with Internal audits, which are completed in each work area, unit, or department (across the entire organization). An internal audit is used to determine "how business is being conducted" and compares results to established procedures without consideration to quality of the procedures. These reviews are continual and usually consist of checklists with "yes" or "no" type questions. Examples of these include:

Operational Readiness Review

Base Reviews

Functional Assistance Review

- Site Visit – Conduct site visits normally as functional assistance trips (FSM 5719).
- National – Conduct and monitor at least one site visit every three years in each Region, according to the criteria for an activity review in FSM 1416 and FSM 5700.
- Region/Area/Station/Forest – Conducted at the discretion of Aviation managers and at any organizational level in accordance with local aviation plans, and FSM 5700. For example, Aviation Safety and Technical Assistance Team (ASTAT), aviation base operational reviews, and cooperator aviation program reviews address this purpose.
- Aviation Preparedness Review

[3] Zhang, H., Wiegmann, D. A., von Thaden, T. L., Sharma, G., & Mitchell, A. A. (2002). Safety Culture: A Concept in Chaos? Proceedings of the Human Factors and Ergonomics Society Annual Meeting, 46(15), 1404–1408. https://doi.org/10.1177/154193120204601520

B. Internal Evaluation

These processes usually go a step further, and consider appropriateness of the policies, procedures, and systems. The internal evaluation program (IEP) is a continuous evaluation process that examines the effectiveness of processes, programs, and procedures integral to each functional area of the aviation program. Checklists will be used as a guide for these evaluation processes to examine the critical functions of aviation programs. The person(s) conducting these internal evaluations will normally be functionally independent functionally independent of the department, unit or organization and the processes being evaluated." Examples of these include:

Aviation Program ASMS Evaluation (national, regional, local or program)

Aviation Management Review

- National – Conduct Aviation Management Reviews (AMR) in accordance with FSM 5719, and/or included as a part of the fire management review (FSM 5193). In addition, in each Deputy Chief's Review, activity review, or other reviews involving aviation, provide special emphasis to the use of Forest Service owned or other Government aircraft used for administration purposes (FSM 1410).
- Region/Area/Station/Forest – Conduct aviation program activities reviews in accordance with regional/local aviation management plans.
- An Internal Evaluation checklist will ask questions to determine if the methods and procedures accomplish necessary functions through additional criteria evaluation of adequacy, while checklists for Internal Audits usually ask "yes" or "no" questions to determine if procedures were followed correctly.

C. Internal Evaluation Corrective Action Requirements

When an internal evaluation is completed, each finding (discrepancy) must be analyzed, and a corrective action plan be developed. The finding may require validation, especially if the auditor has some doubt concerning the relevant standard as it applies to the evaluation checklist question. It is appropriate at this point to perform a risk assessment for significant findings and determine if significant risk is present resulting from the discovered deficiency.

A corrective action plan for each finding shall be developed and include the responsible party, with an assigned due date to complete the action. The responsible party for the functional area associated with a particular finding should also be responsible for correcting that finding.

To formalize IEP corrective action procedures and documentation, the following requirements are established:

A corrective action assignment will result from every IEP finding. Employees perceived to have the best opportunity to develop and implement a corrective action that will remedy the deficiency will be assigned.

BC-ASMS is responsible for the review of corrective actions that affect safety assurance. The action plan can be closed after determining the corrective action is complete. A safety assurance check will be performed between 90 and 120 days after an action plan is closed to verify effectiveness of the implemented corrective action. Depending on the type of audit/evaluation that is being done, the assurance check is normally assigned to a WO Aviation Safety Officer or RASO for completion.

D. Internal Evaluation Program: Auditors and Evaluators

Agency personnel chosen as members of an audit/evaluation team may include members of the NASC, Fixed Wing and Helicopter Inspector Pilots, and Aviation Safety, Airworthiness and Avionics

inspectors. All auditors/evaluators should have training and/or experience in recognized quality management auditing, systems analysis, and risk assessment, as well as technical inspection principles and techniques.

Experience, training, and personality are critical qualities in an audit role. Inspector training is accomplished in a formal course setting, on the job training with another experienced inspector, or using appropriate distance learning resources (websites, books, etc.).

To formalize internal audit and evaluation inspector selection procedures and documentation, the following processes are recognized in for the aviation management program:

The appropriate operational area supervisors (Branch Chief, Program Manager, equivalent regional leadership) are responsible for selecting and assigning personnel responsible for each specific evaluation.

Supervisors will ensure each inspector has an appropriate level of training and experience to effectively conduct the evaluation.

Supervisors will ensure each inspector has the personal demeanor necessary to successfully interface with people during the audit/evaluation process. The right mix of professionalism and personality is a key factor in achieving the objectives of the process.

The inspector assigned shall be documented on the evaluation checklist.

Inspectors will not be assigned to evaluate their own work product or area of assigned responsibility to prevent conflict of interest.

Subject matter experts may assist assigned inspectors in the evaluation. This assistance does not relieve the inspector from personally conducting the evaluation. The inspector has the responsibility to identify and document findings.

E. Aviation Safety and Technical Assistance Teams (ASTAT)

The Forest Service provides representation on ASTAT to support aviation resources and personnel operating in the field during periods of increased aviation operations. The team's purposes are to assist and review helicopter and/or fixed-wing operations on ongoing wildland fires and to provide safety assurance through communication from the field to Fire and Aviation leadership.

Although ASTATs are coordinated regionally, any information available in the form of a formal report or after action should be obtained and reviewed by the Regional Aviation Safety Officer for identified hazards, mitigations, and other safety related trends for inclusion in the larger organizational data analysis effort. This information will be shared regionally as well as with Washington Office Assurance functions for inclusion in the ASMS.

4.3 External Audits

External audits are conducted by entities outside the Forest Service. Coordination for external aviation audits shall be requested through Branch Chief of Aviation Safety Management. Aviation external audits will be conducted periodically for a variety of reasons. External auditors offer a perspective that is unique and apart from that of Forest Service internal evaluations. Every finding resulting from these external audits will follow the procedures listed for internal evaluation findings and corrective action in their entirety. These results will be combined with internal evaluation results in establishing trends and evaluating the organization.

4.4 Aviation Mishap Investigations

Aviation mishap investigation is an assurance process and referenced in the FSM 5720. The Forest Service will utilize only qualified, National Office -approved, aviation investigators to represent the agency in investigations for accidents and incidents with potential (IWPs). The aviation investigation process is outlined in the Forest Service Aviation Mishap Investigation Guide (AMIG) and shall be used for all aviation mishap investigations. The objective of the investigation of an aviation mishap involving agency and/or contract personnel, facilities, and equipment is the prevention of future accidents and incidents, not to determine fault. The information disclosed by aviation mishap investigation reports, mishap review boards and other mishap investigation processes is utilized for the purpose of improving and validating ASMS processes and improving safety performance. Mishap data is one method for measuring the success rate of risk controls. Mishap investigations are carried out to:

A. Better understand the events leading up to the occurrence

B. Evaluate existing safety controls for effectiveness and identify potential new controls required to mitigate hazards.

C. Communicate the safety messages to the appropriate stakeholders.

The Branch Chief- Aviation Safety Management Systems (BC-ASMS), in consultation with the Assistant Director- Aviation (AD-Aviation) is authorized by FSM 5720 to determine the need for an investigation for aviation accidents and incidents with potential.

Aviation Mishap Classification (See Definitions, page 9)

- Aircraft Accident
- Aircraft Incident
- Incident With Potential (IWP)

4.5 Voluntary & Mandatory Reporting

A. Aviation Safety Communiqué

The Aviation Safety Communiqué (SAFECOM) database is a confidential safety reporting and feedback system for accident prevention through trend analysis for employees and aircraft vendors contracted to the USFS. Data obtained from the system is monitored in the assurance component of an ASMS to identify new hazards, share critical safety information through alerts and bulletins, assess performance of existing risk controls in the operational systems and identify training needs.

B. ICAP Reporting

All Forest Service accidents are reported by the BC-ASMS within 14 calendar days of the mishap to GSA in accordance with 41 CFR 102-33 Subpart E.

Chapter 5. Safety Promotion

The agency must continuously promote safety as a core value with practices that support a sound safety culture. Training, information delivery through alerts and bulletins, and positive reporting culture (i.e., SAFECOM), and awards are all part of the Safety Promotion component of ASMS.

Forest Service safety promotion is designed to ensure that employees have a solid foundation regarding their safety responsibilities, the agencies safety policies, and expectations, reporting procedures, and a familiarity with risk controls.

One of the most challenging elements of ASMS is the creation and nurturing of a positive safety culture, in which every person, from the top of the organization to the new hire, understands their role in maintaining a safe operation and actively participates in controlling and minimizing risk. Creating a safety culture begins at the top of the organization, with the incorporation of policies and procedures that cultivate a reporting culture (where structures are in place that allow safety-related information to flow from all levels of the organization into a system empowered to correct problems) and a just culture (in which individuals are both held accountable for their actions and treated fairly by the organization). Maintaining a safety culture requires constant attention by every layer of management and every department within the organization. A central tenet of ASMS is the realization that the safety branch does not own safety, rather safety is owned by every employee.

5.1 Training and Education

The aviation safety training program ensures that personnel are trained and competent to perform their ASMS duties. Safety training shall be appropriate to the individual employee's involvement in the ASMS as well as overall goals of the agency.

A. Aviation Safety Training for Employees

All Forest Service employees share responsibility for aviation safety (FSM 5704.1). Training is crucial for a strong safety culture. Employees are expected to meet training standards:

Fire Related Aviation Position: All employees who work with or around aircraft in fire related activities shall be qualified in accordance with the Fire and Aviation Management Qualifications Handbook FSH 5109.17 and National Wildfire Coordinating Group (NWCG) Standards for Wildland Fire Position Qualifications PMS 310-1.

Non-Fire Related Aviation Position: All employees who work with or around aircraft in non-fire related activities shall be qualified in accordance with the Interagency Aviation Training Guide.

Aviation Line Officers and Supervisors: A supervisor in this context is one who supervises an employee who performs aviation duties as part of their primary or collateral duties. Both the Supervisor and the employee being supervised are Forest Service employees. Examples of employees who perform aviation duties include but are not limited to: Forest/Unit Aviation Officer, Helicopter Manager, Air Tactical Group Supervisor, Air Tanker Base Manager, Fixed-Wing Flight Manager, UAS Pilot, and employees required to complete aviation training to meet agency objectives. (A-314)

ASMS training under this section, 5.1. a, b, and c, and required by 5709.16 Chapter 60, integrates ASMS roles and responsibilities, policy and objectives, safety risk management, and safety assurance.

Employees will receive training commensurate with their position level within the organization and impact on the safety of the organization's operations. Personnel should be assigned only to activities in which they have been successfully trained.

B. Responsibilities

Oversight of training is critical for aviation accident prevention. The education, training, and qualification of personnel at all organizational levels are the responsibility of management. All managers and supervisors must be aware of policy as it relates to aviation programs for which they are responsible.

Agency managers are responsible for ensuring that all employees involved in the use or control of aviation resources receive an appropriate level of aviation safety training.

Personnel with aviation responsibilities must comply with policy and program guidance (5709.16 Chapter 60) to ensure their training is kept current. All aviation training is documented in each employee's training record.

5.2 Instructional Systems

The following instructional systems support the training and educational needs of Forest Service missions which rely upon aviation resources for transportation and operational support. Task books are to be utilized where available and developed as appropriate.

A. Interagency Aviation Training (IAT)

Refer to https://www.iat.gov and the IAT Guide for information on specific requirements. An interagency-wide goal is to accomplish safe, efficient, and effective utilization of aviation resources. Increasing employee awareness of policy, procedures, and safe practices must receive high priority. Aviation training, whether safety, specialized, or management, is a method to increase this awareness and a key to meeting this goal.

IAT is conducted through Local/Regional sessions, and web-based training.

B. Wildland Fire Position Qualifications/Forest Service Fire and Aviation Qualification

Refer to https://www.nwcg.gov/publications/pms310-1;
https://www.fs.usda.gov/sites/default/files/2023-02/FSFAQ-2023-Chapter2-ocr.pdf

NWCG and Forest Service additional requirements use a performance-based approach that focuses on verifying the capabilities of personnel to perform as required in the various incident-related positions. This approach incorporates education, training, and experience to build proficiency and establishes performance as the primary qualification criterion.

C. Professional Training for Aviation Safety Managers

Forest Service personnel holding primary aviation safety positions (RASO, ASO, BC-ASMS) must be graduates of an Aviation Safety Officer (ASO) course provided by a recognized training provider and authority in aviation safety (such as the University of Southern California Safety & Security Course, Transportation Safety Institute ASO Course, Embry Riddle ASO Course or one of the Armed Forces ASO courses) before appointment, or within one year after appointment. The five basic courses that make up ASO training are as follows:

Basic Aviation Accident Investigation

Human Factors

Aviation Risk Management

Aviation Safety Program Management/ASMS

Legal Aspects of Aviation

To remain current, aviation safety personnel must complete 16 hours of CE required every 24 months. These training requirements are in line with Interagency Committee for Aviation Policy (ICAP) Federal ASO requirements.

5.3 Aviation Safety Awards Program

Individuals and organizations may be recognized with awards for exceptional performance or acts, service in support of agency aviation safety, length of service, or aircraft mishap prevention.

The Forest Service sponsors a series of awards to recognize exemplary dedication to the safety of agency aviation operations. Examples of actions that could be rewarded are:

- Identification of hazard(s) (An act or suggestion which prevents damage or injury).
- Assisting in investigating or evaluation.
- Performing research on a topic of safety interest and writing a report or article for employees' use.

The goal is not only to reward the employee for safety vigilance and for potentially or actually preserving agency resources, but also to show by example that an investment in safety consciousness pays off in conserved resources that might otherwise be lost to accidents. The preservation of the story behind each awarded act also helps to spread the exemplary behavior pattern and enhances safety promotion.

Individuals and organizations may be recognized with awards for exceptional acts or service in support of Forest Service aviation safety and aircraft mishap prevention.

Rewarding innovation allows us to utilize technological advancements to create a more effective and efficient aviation management program.

A. Airwards and Safe Flying Award for Pilots

National Airwards are intended for Forest Service employees and units, other local government employees and organizations, and non-government individuals (except contractors) and organizations who perform exceptional acts or service in support of aviation safety and accident prevention. Documentation of exceptional service must be in writing. There are two categories of aviation safety awards: individual and unit.

Submit nominations for aviation safety awards to the RASO. Airwards are given at the discretion of the RASO and/or WO- BC ASMS.

The Safe Flying award recognizes Forest Service employee pilots who have distinguished themselves through a history of safe flight operations.

Note:	Eligibility: Forest Service pilots who have accumulated the specified flight time in hours or longevity in calendar years in the following categories are eligible for nomination and award:

Award of Merit. 1,000 hours or five years of accident-free flight time.

Award of Distinction. 2,000 hours or 10 years of accident-free flight time.

Award of Excellence. 3,000 hours or 15 years of accident-free flight time.

Award of Honor. 4,000 hours or 20 years of accident-free flight time.

B. Standards. Only pilot-in-command flight hours qualify for this award.

All flight time submitted must have been accumulated on official government business.

Dates for consideration need not be consecutive.

Computation dates begin on the day the nominee was placed on flight status as a Forest Service employee pilot. If the pilot has been involved in an accident attributed to that pilot's error, a new computation date begins on the day following the aircraft accident.

C. Procedures for Nomination. The Regional Aviation Officer or a pilot's first-line supervisor may make the nomination and must include the following information:

Full name and assigned Region/Unit/Forest.

Pilot's position and job series, GS-2181 or -2101.

Verification of flight time and years of service as a Forest Service employee pilot.

D. Exceptions.

Any incident where pilot error or negligence resulted in damage to an aircraft or injury to personnel, or an aviation hazard where any careless or reckless operation by the pilot has been verified, shall be cause for non-selection of a pilot nominated for this award, except when an accident was caused by material failure or other such circumstances, and the aviation accident report and review established that the pilot's actions were not a contributing factor.

Nominations which include an exception must be fully documented in an enclosure to the nomination. Decisions by the WO- BC ASMS and/or the RASO relative to the exception(s) are final.

5.4 Safety Communication and Awareness

Effective communication can make the difference between an accident occurring or being prevented. Leadership and aviation users are responsible to each other to promote open lines of communication, both up and down the chain of command. Much of the information that is used to develop our publications comes from the field.

The SAFECOM system, as a reporting system, contributes to both the assurance and promotion roles in accident prevention, lessons learned and safety communication. (Reference section 4.3.1 for further guidance) RASO's, RAO's, and the FHP NASM are the conduit and focal point for this communication to occur frequently and routinely.

Safety communication therefore aims to:

A. Ensure that all staff members are fully aware of the ASMS.

B. Convey safety-critical information.

C. Explain why particular actions are taken.

D. Explain why safety procedures are introduced or changed.

E. Convey "nice-to-know" information.

5.5 Publications.

To facilitate communication, the WO Aviation Safety Branch publishes the following:

A. **Safety Alert**. The "Safety Alert" is red-bordered and will be utilized to disseminate information of a significant nature regarding aviation safety within the Agency. The three areas addressed are operations, maintenance, or publications. These "Safety Alerts" will be published on an unscheduled basis.

B. **Aviation Accident Prevention Bulletin**. The Bulletin is green-bordered and will be utilized to disseminate information of a general nature regarding aircraft mishap prevention concepts, methods, procedures, and efforts. Bulletins will be published on an unscheduled basis as pertinent information/subject materials become available.

C. **Technical Bulletin**. The "Tech Bulletin" is Blue-bordered and will be utilized to disseminate information of a general nature regarding aircraft mishap prevention concepts, methods, procedures, and efforts of a technical/mechanical nature. Bulletins will be published on an unscheduled basis as pertinent information/subject materials become available.

D. **Aviation Lessons Learned**. The "Lesson Learned Bulletin" is Purple-bordered and will be utilized to disseminate information of a general nature regarding lessons taken from actual events, near misses, mishaps or positive events that demonstrate the effects of best practices. Lessons Learned Bulletins will be published on an unscheduled basis as pertinent information/subject materials become available.

E. **Information Bulletin**. The orange-bordered document is used to communicate general safety information that does not fall into the four above categories.

F. **Aviation Safety Summary**. An annual review of aircraft mishaps associated statistical data, and trend analysis will be published and distributed following the mishap reporting year.

G. **SAFECOM Summaries**. These are issued as Information Memoranda that maintain awareness of safety trends and lessons learned distributed during peak seasonal activity.

These publications will remain valid until rescinded by the Washington Office. Safety documents as described above might be developed and distributed with our interagency partners as appropriate. RASOs may develop the above safety documents appropriate to their level of the organization and must coordinate the development and dissemination of those documents with the Branch Chief, ASMS. Regional safety publications must be items of only regional significance and must be labeled as such.

Appendix 1 ASMS Evaluation Tool

1.1. Introduction

Safety is a core value of the US Forest Service (USFS).

The International Civil Aviation Organization's (ICAO's) Annex 19 promotes a common approach to Safety Management across aviation domains; both for States and for organizations. Many of the most prominent ASMS frameworks or protocols are based on Annex 19 in one way or another.

This evaluation tool is based on the Safety Management International Collaboration Group (SM ICG) ASMS Evaluation Tool. It uses a common approach toward this goal.

One advantage of the tool is that it evaluates the overall effectiveness of the ASMS; as a function of both compliance and performance, through a series of indicators based on ICAO Annex 19 and ICAO Safety Management Manual (doc 9859) and is organized by the ICAO SMS Framework. Each indicator should be reviewed to determine whether it is Present, Suitable, Operating, or Effective, using the definitions and guidance set out below.

This framework has been further revised to include policy and national plans of the US Forest Service. Many aspects of the systems used by the agency are mandated by existing policy.

This concept of evaluating ASMS effectiveness supports the move from traditional, compliance-based oversight to performance-based oversight that focuses on how the ASMS is performing. It provides a common baseline for ASMS effectiveness evaluation that creates a sound basis for mutual acceptance of ASMS.

1.2. When to Use the Tool

The evaluation tool is designed to be used by both USFS units and contracted organizations. It can be used for an initial implementation or on-going oversight of an organization. Organizations can use it to evaluate the maturity and effectiveness of their own ASMS for the purpose of continuous improvement. Finally, organizations could use the tool as an ASMS gap-analysis and accordingly develop an informed, forward-looking plan regarding further implementation.

Initial implementation. In this initial certification phase, a large part of the ASMS evaluation could be carried out by a desktop review of relevant ASMS documentation. However, carrying this out at the organization provides an opportunity for the management to advise and guide the organization on its ASMS implementation and support standardized implementation.

After initial implementation, the organization should start using the ASMS as part of its operations. Ample time should be allowed for the organization's ASMS to mature before it carries out ongoing surveillance that evaluates whether the processes are Present, Suitable, or Operating. An organization may eventually have Effective ASMS processes. To check that ASMS processes remain Operating and/or Effective, the ASMS should be re-evaluated on a regular basis to evaluate how well it is performing. The review should evaluate all the items in the evaluation tool which can be done by a combination of organizational visits, meetings, and desktop reviews.

As an organization's ASMS processes mature and moves to Operating and Effective, the Suitable criteria may also need to be revisited.

Valuable information about ASMS effectiveness can be gained from other surveillance activities. This may include such activities as routine compliance audits and inspections, occurrence investigations, and meetings with the organization.

In the context of performance-based and risk-based oversight, the results of the ASMS evaluation may be considered along with other data and information to determine the type, scope, and frequency of surveillance activities.

1.3. Policy

A. It is U.S. Forest Service policy that all organization must utilize Safety Management System as the guiding safety process for aviation operations. The detailed elements of agency aviation safety must be maintained in the NASMSG. This guide contains best practices to achieve goals and objectives, and contains mandatory policy (FSM 1110.8, FSM 5108).

B. References:

USFS Forest Service Manual 5700 - http://www.fs.fed.us/cgi-bin/Directives/get_dirs/fsm?5700

USFS Forest Service Handbook 5709.16, chapter 20 and the NASMSG - http://www.fs.fed.us/cgi-bin/Directives/get_dirs/fsh?5709.16

USFS Forest Service Handbook 5720.31 – Principles for Aviation SMS - http://www.fs.fed.us/cgi-bin/Directives/get_dirs/fsh?5709.20

USFS Forest Service Health and Safety Code Handbook, FSH 6709.11 - http://www.fs.fed.us/cgi-bin/Directives/get_dirs/fsh?6709.11.

C. Responsibilities.

USFS Washington Office, Regions, Stations, and Programs are responsible for implementing their ASMS.

Supervisors:

In accordance with 5704.2 – Supervisors, at all organizational levels, shall:

- Ensure that aviation users in their units have the appropriate aviation experience and training.
- Ensure that their aviation program has appropriate aviation supervision.
- Understand, implement, and maintain the responsible areas of the Forest Service Aviation Safety Management System within the scope of their duties.

All offices, regions, forests, and units of USFS, and individuals are encouraged to supplement these requirements to better meet the needs of the mission and environment.

1.4. Terms

A. Present (P): There is evidence that the relevant indicator is documented within the organization's ASMS documentation.

B. Suitable (S): The relevant indicator is suitable based on the size, nature, and complexity of the organization and the inherent risk in its activity.

C. Operating (O): There is evidence that the relevant indicator is in use and an output is being produced.

D. Effective (E): There is evidence that the relevant indicator is achieving the desired outcome and has a positive safety impact.

Note:	**Generally, Present and Suitable are used for initial implementation. Operating and Effective are expected to be found in a functioning ASMS.**

E. Due to the continuously changing and dynamic nature of aviation, during ongoing or subsequent evaluations the Suitable designation should be re-evaluated considering any changes to the organization and its activities.

F. An item cannot be considered Operating or Effective if it is not Present and it cannot be considered as Present if it is not documented. Documentation ensures consistent repeatable and systematic outcomes.

Section 2 Safety Policy and Objectives

2.1. Management commitment

A. Indicators of compliance and performance.

There is a safety policy, signed by the Accountable Manager, which includes a commitment to continuous improvement; observes all applicable legal requirements and standards; and considers best practices.

The safety policy includes a statement to provide appropriate resources and the organization is managing resources by anticipating and addressing any shortfalls.

There are policies in place for safety critical roles relating to all aspects of Fitness for Duty (for example, Alcohol and Drugs Policy or Fatigue).

B. Examples.

Interview the Accountable Executive to assess their knowledge and understanding of the safety policy.

Check that the safety policy is reviewed periodically for content and currency.

Confirm that the safety policy meets the requirements.

Interview staff to determine to what extent the safety policy is known, as well as how readable and understandable it is.

Review available resources including personnel, equipment, and financial.

There are sufficient and competent personnel.

Review planned resources versus actual resources.

Check how a positive safety culture is encouraged and impacts the overall effectiveness.

C. Guidance.

Present: There is a safety policy, signed by the Accountable Manager, which includes a commitment to continuous improvement; observes all applicable legal requirements and standards; and considers best practices. The safety policy includes a statement to provide appropriate resources.

Suitable: The safety policy is easy to read. The content is customized to the organization. There is a process for assessing resources and addressing any shortfalls.

Operating: The safety policy is reviewed periodically to ensure it remains relevant to the organization. The organization is assessing the resources being provided to deliver a safe service and taking action to address any shortfalls.

Effective: The Accountable Executive is familiar with the contents of the safety policy and endorses it. The organization is reviewing and taking action to address any forecasted shortfalls in resources.

2.2. Safety Policy communication

A. Indicators of compliance and performance.

There is a means in place for the communication of the safety policy.

The Accountable Executive and the senior management team promote a positive safety/just culture and demonstrate their commitment to the safety policy through active and visible participation in the safety management system.

B. Examples.

Review how the safety policy is communicated.

Safety policy is clearly visible to all staff including relevant contracted staff and third-party organizations.

Question managers and staff regarding knowledge of the safety policy.

All managers are familiar with the key elements of the safety policy.

Evidence of senior management participation in safety meetings, training, conferences, etc.

Feedback from safety surveys that include specific just culture aspects.

Relationship with regulator and other stakeholders.

Review how a positive safety and just culture are promoted.

C. Guidance.

Present: There is a means in place for the communication of the safety policy. The management commitment to safety is documented within the safety policy.

Suitable: The safety policy is clearly visible to all staff (consider multiple sites). The safety policy is understandable (consider multiple languages). The Accountable Executive and the senior management team have a well-defined role in the safety management system.

Operating: The safety policy is communicated to all personnel (including relevant contract staff and organizations). The Accountable Executive and the senior management team are promoting their commitment to the safety policy through active and visible participation in the safety management system.

Effective People across the organization are familiar with the policy and can describe their obligations in respect of the safety policy. Decision making, actions, and behaviors reflect a positive safety/just culture and there is good safety leadership that demonstrates commitment to the safety policy.:

2.3. Safety Policy promotion

A. Indicators of compliance and performance.

There is a means in place for the communication of the safety policy.

The Accountable Executive and the senior management team promote a positive safety/just culture and demonstrate their commitment to the safety policy through active and visible participation in the safety management system.

B. Examples.

Review how the safety policy is communicated.

Safety policy is clearly visible to all staff including relevant contracted staff and third-party organizations.

Question managers and staff regarding knowledge of the safety policy.

All managers are familiar with the key elements of the safety policy.

Evidence of senior management participation in safety meetings, training, conferences, etc.

Feedback from safety surveys that include specific just culture aspects.

Relationship with regulator and other stakeholders.

Review how a positive safety and just culture are promoted.

C. Guidance.

Present: There is a means in place for the communication of the safety policy. The management commitment to safety is documented within the safety policy.

Suitable: The safety policy is clearly visible to all staff (consider multiple sites). The safety policy is understandable. The Accountable Executive and the senior management team have a well-defined role in the safety management system.

Operating: The safety policy is communicated to all personnel (including relevant contract staff and organizations). The Accountable Executive and the senior management team are promoting their commitment to the safety policy through active and visible participation in the safety management system.

Effective: People across the organization are familiar with the policy and can describe their obligations in respect of the safety policy. Decision making, actions, and behaviors reflect a positive safety/just culture and there is good safety leadership that demonstrates commitment to the safety policy.

2.4. Safety Policy Reporting

A. Indicators of compliance and performance.

The safety policy actively encourages safety reporting.

A just culture policy and principles have been defined that clearly identifies acceptable and unacceptable behaviors to promote a just culture.

B. Examples.

Evidence of when the just culture principles have been applied following an event.

Evidence of interventions from safety investigations addressing organizational issues rather than focusing only on the individual.

Review how the organization is monitoring reporting rates.

Review the number of aviation safety reports appropriate to the activities.

Safety reports include the reporter’s own errors and events they are involved in (events where no one was watching).

Feedback on just culture from staff safety culture surveys.

Interview staff representatives to confirm that they agree with just culture policy and principles.

Check that staff are aware of the just culture policy and principles.

C. Guidance.

Present: A just culture policy and principles have been defined.

Suitable: The just culture policy clearly identifies acceptable and unacceptable behaviors. The principles ensure that the policy can be applied consistently across the whole organization. The just culture policy and principles are understandable and clearly visible.

Operating: There is evidence of the just culture policy and supporting principles being applied and promoted to staff.

Effective: The just culture policy is applied in a fair and consistent manner and staff trust the policy. There is evidence that the line between acceptable and unacceptable behavior has been determined in consultation with staff and staff representatives.

2.5. Safety Objectives

A. Indicators of compliance and performance.

Safety objectives have been established that are consistent with the safety policy and they are communicated throughout the organization.

B. Examples.

Assess whether the safety objectives are appropriate and relevant.

Objectives are defined that will lead to an improvement in processes, outcomes, and the development of a positive safety culture.

Assess how safety objectives are communicated throughout the organization.

Safety objectives are being measured to monitor achievement through SPIs and SPTs.

Assess if the safety objectives have considered the State safety objectives in the SSP.

C. Guidance.

Present: Safety objectives have been established that are consistent with the safety policy and there is a means to communicate them throughout the organization.

Suitable: Safety objectives are relevant to the organization and its activities. Safety objectives are understandable and clearly visible. Safety objectives are aligned with the SSP.

Operating: Safety objectives are being regularly reviewed and are communicated throughout the organization.

Effective: Achievement of the safety objectives is being monitored by senior management and action taken to ensure they are being met.

2.6. Appointment of Key Personnel

A. Indicators of compliance and performance.

A competent safety manager who is responsible for the implementation and maintenance of the ASMS has been appointed with a direct reporting line to the Accountable Executive.

The organization has allocated sufficient resources to manage the SMS including, but not limited to, competent staff for safety investigation, analysis, auditing, and promotion.

The organization has established appropriate safety committee(s) that discuss and address safety risks and compliance issues and includes the Accountable Executive and the heads of functional areas.

B. Examples.

Review safety manager role including credibility and status.

Review the training that the safety manager has received.

Evidence of maintained competency.

Review how the safety manager gets access to internal and external safety information.

Review how the safety manager communicates and engages with operational staff and senior management.

Review the safety manager's workload/allocated time to fulfil role.

Check there are sufficient resources for SMS activities such as safety investigation, analysis, auditing, safety meeting attendance, and promotion.

Review of safety report action and closure timescales.

Interviews with Accountable Executive and safety manager.

Check for any conflicts of interest and that they have been identified and managed.

C. Guidance.

Present: A safety manager who is responsible for the implementation and maintenance of the SMS has been appointed with a direct reporting line to the Accountable Executive.

Suitable: The safety manager is competent. Sufficient time and resources are allocated to maintain the SMS.

Operating: The safety manager has implemented and is maintaining the SMS. The safety manager is in regular communication with the Accountable Executive and escalates safety issues when appropriate. The safety manager is accessible to staff in the organization.

Effective: The safety manager is competent to manage the SMS and identifies improvements in a timely manner. There is a close working relationship with the Accountable Executive and the safety manager is considered a trusted advisor and given appropriate status in the organization.

2.7. Appointment of Safety Committee

A. Indicators of compliance and performance.

The organization has established appropriate safety committee(s) that discuss and address safety risks and compliance issues and includes the Accountable Executive and the heads of functional areas.

B. Examples.

Review safety committee and meeting structure and Terms of Reference for each committee/meeting.

Review meeting attendance levels.

Review meeting records and actions.

Check that outcomes are communicated to the rest of the organization.

Evidence of safety objectives, safety performance, and compliance are being reviewed and discussed at meetings.

Participants challenge what is being presented when there is limited evidence.

Senior management are aware of the most significant risks faced by the organization and the overall safety performance of the organization.

C. Guidance.

Present: The organization has established safety committee(s).

Suitable: Safety committee(s)' structure and frequency support the SMS functions across the organization. The scope of the safety committee(s) includes safety risks and compliance issues. The attendance of the highest-level safety committee includes at least the Accountable Executive and the heads of functional areas.

Operating: There is evidence of meetings taking place detailing the attendance, discussions, and actions. The safety committee(s) monitor the effectiveness of the SMS and compliance monitoring function by reviewing there are sufficient resources. Actions are being monitored and appropriate safety objectives and SPIs have been established.

Effective: Safety committees include key stakeholders. The outcomes of the meetings are documented and communicated, and any actions are agreed, taken, and followed up in a timely manner. The safety performance and safety objectives are reviewed and actioned as appropriate.

2.8. Coordination of emergency response planning

A. Indicators of compliance and performance.

An appropriate emergency response plan (ERP) has been developed and distributed that defines the procedures, roles, responsibilities, and actions of the various organizations and key personnel.

The ERP is periodically tested for the adequacy of the plan and the results reviewed to improve its effectiveness.

B. Examples.

Review emergency response plan.

Review how coordination with other organizations is planned.

Review how ERP is distributed and where copies are held.

Interview key personnel and check they have access to the ERP.

Check that different types of foreseeable emergencies have been considered.

Review when the plan was last reviewed and tested, and actions taken.

C. Guidance.

Present: A coordinated ERP has been developed and defined. Key personnel always have easy access to the relevant parts of the ERP.

Suitable: The ERP defines the procedures, roles, responsibilities, and actions of the various organizations and key personnel. The frequency and methods for testing the ERP are defined. The coordination with other organizations (including non-aviation organizations) is defined with appropriate means.

Operating: The ERP is reviewed and tested to make sure it remains up to date. There is evidence of coordination with other organizations as appropriate.

Effective: The results of the ERP review and testing are assessed and actioned to improve its effectiveness.

2.9. SMS Documentation

A. Indicators of compliance and performance.

The SMS documentation includes the policies and processes that describe the organization's safety management system and processes and is readily available to all relevant personnel.

SMS documentation, including SMS related records, are regularly reviewed, and updated with appropriate version control in place.

B. Examples.

Review the SMS documentation and amendment procedures.

Check for cross references to other documents and procedures.

Check availability of SMS documentation to all staff.

Check that staff know where to find safety-related documentation including procedures appropriate to their role.

Review the supporting SMS documentation (hazard logs, meeting minutes, safety performance reports, risk assessments, etc.).

Check how safety records are stored and version controlled.

Check appropriate staff are aware of the records control processes and procedures.

C. Guidance.

Present: The SMS documentation includes the policies and processes that describe the organization's SMS and processes. The SMS documentation defines the SMS outputs and which records of SMS activities will be stored. Records to be stored, storage period, and location are identified.

Suitable: SMS documentation is readily available to all relevant personnel. SMS documentation is comprehensible. SMS documentation is consistent with other internal management systems and is representative of the actual processes in place. Data protection and confidentiality rules have been defined.

Operating: Changes to the SMS documentation are managed. Everyone is familiar with and follows the relevant parts of the SMS documentation. SMS activities are appropriately stored and found to be complete and consistent with data protection and confidentiality control rules.

Effective: SMS documentation is proactively reviewed for improvement. SMS records are routinely used as inputs for safety management-related tasks and continuous improvement of the SMS.

Section 3 Safety Risk Management

3.1. Reporting system

A. Indicators of compliance and performance.

There is a confidential reporting system to capture errors, hazards, and near misses that is simple to use and accessible to all staff.

There is a confidential reporting system that provides appropriate feedback to the reporter and, where appropriate, to the rest of the organization.

Personnel express confidence and trust in the organization's reporting policy.

B. Examples.

The interagency SAFECOM system is the agency preferred system. Review the SAFECOM submissions for access and ease of use.

Note:	**SAFECOM is voluntary and not to be used for contract evaluations, compliance, or punitive actions (FSM 5724.1 – Aviation Safety Communiqué).**

Check staff's trust of and familiarity with SAFECOM, and whether they know what should be reported.

Look for Evidence of feedback to reporter, the organization, and third parties.

Assess volume and quality of reports, including whether personnel are reporting their own errors and mistakes.

Review report closure rates.

Check whether contractors and customers can make reports.

Review how reports in the system are analyzed.

Check that relevant staff are aware of which occurrences should be mandatory.

Assess how senior management engage with the outputs of the reporting system.

C. Guidance.

Present: There is a confidential reporting system to capture mandatory occurrences and voluntary reports that includes a feedback system and stored on a database. The process identifies how reports are actioned, and timescales are specified and addressed.

Suitable: The reporting system is accessible and easy to use by all personnel. Responsibilities, timelines, and format for the feedback are meaningful and well defined. Data protection and confidentiality is ensured.

Operating: The reporting system is being used by all personnel. There is feedback to the reporter of any actions taken (or not taken) and, where appropriate, to the rest of the organization. Reports are evaluated, processed, analyzed, and stored. Staff are aware of and fulfil their responsibilities in respect to the reporting system. Reports are processed within the defined timescales.

Effective: There is a healthy reporting system based on the volume of reporting and the quality of reports received. Safety reports are acted on in a timely manner. Personnel express confidence and trust in the organizations' reporting policy and process. The reporting system is being used

to make better management decisions and continuously improve. The reporting system is available for third parties to report (partners, suppliers, and contractors).

3.2. Hazard Identification

A. Indicators of compliance and performance.

There is a process that defines how hazards are identified from multiple sources through reactive and proactive methods (internal and external).

The hazard identification process identifies human performance related hazards.

There is a process in place to analyze safety data and safety information to look for trends and gain useable management information.

Safety investigations are carried out by appropriately trained personnel to identify root causes (why it happened, not just what happened).

B. Examples.

Review how hazards are identified, analyzed, addressed, and recorded.

Review structure and layout of hazard log.

Consider hazards related to:

- Possible accident scenarios.
- Human and organizational factors.
- Business decisions and processes.
- Third party organizations; and
- Regulatory factors.

Review what internal and external sources of hazards are considered such as safety reports, audits, safety surveys, investigations, inspections, brainstorming, management of change activities, commercial and other external influences, etc.

Review whether safety investigations identify human and organizational contributing factors.

C. Guidance.

Present: There is a process that defines how hazards are identified though reactive and proactive methods. The triggers for safety investigations are identified.

Suitable: Multiple sources of hazards (internal and external) are considered and reviewed, as appropriate. The data analysis process enables gaining useable safety information. Hazards are documented in an easy-to-understand format. The level of sign-off for safety investigations is defined and adequate to the level of risk.

Operating: The hazards are identified and documented. Human and organizational factors related to hazards are being identified.

Effective Safety investigations are carried out and recorded. The organization has a register of the hazards that is maintained and reviewed to ensure it remains up to date. It is continuously and proactively identifying hazards related to its activities and the operational environment and involves all key personnel and appropriate stakeholders including external organizations. Hazards are continuously assessed in a systematic and timely manner. Safety investigations identify causal/contributing factors that are acted upon.

3.3. Risk Analysis

A. Indicators of compliance and performance.

There is a process for the management of risk that includes the analysis and assessment of risk associated with identified hazards expressed in terms of likelihood and severity (or alternative methodology).

There are criteria for evaluating the level of risk the organization is willing to accept and risk assessments and ratings are appropriately justified.

B. Examples.

Review the risk classification scheme and procedures.

Check that severity and likelihood criteria are defined (or that an alternative methodology is described).

Review whether risk assessments are carried out consistently.

Sample an identified hazard and review how it is processed and documented.

Review what triggers a risk assessment.

Check any assumptions made and whether they are reviewed.

Review how issues are classified when there is insufficient quantitative data available.

Check that the process defines who can accept what level of risk.

Check that the risk register is being reviewed and monitored by the appropriate safety committee(s).

Evidence of risk acceptability being routinely applied in decision making processes.

C. Guidance.

Present: There is a process for the analysis and assessment of safety risks. The level of risk the organization is willing to accept is defined.

Suitable: Severity and likelihood criteria are clearly defined and fit the service provider’s actual circumstances. The risk matrix and acceptability criteria are clearly defined and usable. Responsibilities and timelines for accepting the risk are clearly defined.

Operating: Risk analysis and assessments are carried out in a consistent manner based on the defined process. The defined risk acceptability is being applied.

Effective: Risk analysis and assessments are reviewed for consistency and to identify improvements in the processes. Risk assessments are regularly reviewed to ensure they remain current. Risk acceptability criteria are used routinely and applied in management decision making processes and are regularly reviewed.

3.4. Risk Controls

A. Indicators of compliance and performance.

The organization has a process in place to make decisions and apply appropriate and effective risk controls.

Senior management have visibility of medium and high-risk hazards and their mitigation and controls.

B. Examples.

Risk controls consider human and organizational factors.

Evidence of risk controls being actioned and follow up.

Aggregate risk is being considered.

Check whether the risk controls have reduced the residual risk.

Risk controls are clearly identified.

Review the use of risk controls that rely solely on human intervention.

Check that new risk controls do not create additional risks.

Check whether the acceptability of the risks is made at the right management level.

C. Guidance.

Present: The organization has a process in place to decide and apply risk controls.

Suitable: Responsibilities and timelines for determining and accepting the risk controls are defined.

Operating: Appropriate risk controls are being applied to reduce the risk to an acceptable level including timelines and allocation of responsibilities. Human Factors are considered as part of the development of risk controls.

Effective: Risk controls are practical and sustainable, applied in a timely manner, and do not create additional risks. Risk controls take Human Factors into consideration.

Section 4 Safety Assurance

4.1. Safety Performance Monitoring

A. Indicators of compliance and performance.

Safety performance indicators (SPIs) linked to the organization's safety objectives have been defined, promulgated, and are being monitored and analyzed for trends.

B. Examples.

Evidence that SPIs are based on reliable sources of data.

Evidence of when SPIs were last reviewed.

The defined SPIs and targets are appropriate to the organization's activities, risks, and safety objectives.

SPIs are focused on what is important rather than what is easy to measure.

Consideration of any State SPIs.

Review whether any action has been taken when an SPI is indicating a negative trend (reflecting a risk control or an inappropriate SPI).

Evidence that results of safety performance monitoring are discussed at the senior management level.

Evidence of feedback provided to the Accountable Executive.

C. Guidance.

Present: There is a process in place to measure the safety performance of the organization including SPIs and targets linked to the organization's safety objectives and to measure the effectiveness of safety risk controls.

Suitable: SPIs are focused on what is important rather than what is easy to measure. Reliability of data sources is considered in the design of SPIs. SPIs are linked to the identified risks and safety objectives. Frequency and responsibility for the trend monitoring of SPIs are appropriate. targets have been set. Agency SPIs are considered, as applicable.

Operating: The safety performance of the organization is being measured and meaningful SPIs are being continuously monitored and analyzed for trends.

Effective: SPIs are demonstrating the safety performance of the organization and the effectiveness of risk controls based on reliable data. SPIs are reviewed and regularly updated to ensure they remain relevant. Where the SPIs indicate that a risk control is ineffective, appropriate action is taken.

4.2. Risk Mitigations and Controls Are Verified

A. Indicators of compliance and performance.

Risk mitigations and controls are being verified/audited to confirm they are working and effective.

Safety assurance considers activities carried out by all directly contracted organizations.

B. Examples.

Evidence of risk controls being assessed for effectiveness (e.g., audits, surveys, reviews, SPIs and safety performance targets [SPTs], reporting systems).

Evidence of risk controls applied by contracted organizations being assessed and overseen (e.g., quality check, reviews, and regular meetings).

Information from safety assurance and compliance monitoring activities feeds back into the safety risk management process.

Review where risk controls have been changed because of the assessment.

C. Guidance.

Present: There is a process in place to assess whether the risk controls are applied and effective.

Suitable: Responsibilities, methods, and timelines for assessing risk controls are defined. Contracted organizations are included in the safety assurance process.

Operating: Risk controls are being verified to assess whether they are applied and effective.

Effective: Risk controls are assessed, and actions taken to ensure they are effective and delivering a safe service.

4.3. Internal Audits

H. Indicators of compliance and performance.

Responsibilities and accountability for ensuring compliance with safety regulations are defined and applicable requirements are clearly identified in organization manuals and procedures.

There is an internal audit program including details of the schedule of audits and procedures for audits, reporting, follow up, and records.

Responsibilities and accountabilities for the internal audit process are defined and there is a person or group of persons with responsibilities for internal audits with direct access to the Accountable Manager.

I. Examples.

Review how senior management ensure the organization remains in compliance.

Review job descriptions for compliance responsibilities.

Evidence that senior management act on internal and external audit results.

Review how independence of the internal audit function is achieved.

Review how the internal audit function interacts with:

Senior management,

Line managers, and

The safety management staff.

Assess the contents of the program against any regulatory requirements.

J. Guidance.

Present: Responsibilities and accountabilities for compliance are defined. The organization has an internal audit program and procedures for audits, reporting, and records. A person or group of persons with responsibilities for internal audits has been identified and they have direct access to the Accountable Executive.

Suitable: The internal audit program covers all applicable regulations and includes details of the schedule of audits. Independence of the internal audit function is achieved.

Operating: The compliance monitoring program is being followed and regularly reviewed. All staff are aware of their responsibilities and accountabilities for compliance and to follow processes and procedures. Internal and external audit results are reported to the Accountable Executive and senior management.

Effective: Individuals are proactively identifying and reporting potential non-compliances. The Accountable Executive and senior management actively seek feedback on the status of internal and external audit activities.

4.1. Post Audit Follow-up

A. Indicators of compliance and performance.

After an audit, there is appropriate analysis of causal factors and corrective/preventive actions are taken.

B. Examples.

Review the methods used for causal analysis.

Check that the method is used consistently.

Review any repeat findings and check for actions have not been implemented or are overdue.

Check for timely implementation of actions.

Review senior management awareness of the status of significant findings and related corrective/preventive actions.

Check that appropriate personnel participate in the determination of causes and contributing factors.

Look for consistency between internal audit results and external audit results.

Review whether causal factors are considered as potential hazards.

C. Guidance.

Present: The process for the identification and follow-up of corrective/preventive actions are defined. The interface between internal audits and the safety risk management processes is described.

Suitable: Responsibilities and timelines for determining, accepting, and following-up the corrective/preventive action are defined. Compliance monitoring includes contracted activities.

Operating: The identification and follow-up of corrective/preventive actions is carried out in accordance with the procedures including causal analysis to address root causes. The status of corrective/preventive actions is regularly communicated to relevant senior management and staff.

Effective: The organization investigates the systemic causes and contributing factors of findings. The organization proactively reviews the status of corrective/preventive actions. Effectiveness of the corrective/preventive actions is verified.

4.2. Management of Change

A. Indicators of compliance and performance.

The organization has a process to identify whether changes have an impact on safety and to manage any identified risks in accordance with existing safety risk management processes.

Human Factor (HF) issues have been considered as part of the change management process and, where appropriate, the organization has applied the appropriate human factor or human-centered design standards to the equipment and physical environment design.

B. Examples.

Key stakeholders are involved in the process.

Review what triggers the process.

Review recent changes that have been through the risk assessment process.

Check that change is signed off by an appropriately authorized person.

Transitional risks are being identified and managed.

Review follow up actions such as whether any assumptions made have been validated.

Review whether there is an impact on previous risk assessments and existing hazards.

Review whether consideration is given to the accumulative effect of multiple changes.

Review that organization-related changes have considered safety risks (organizational restructuring, upsizing, or downsizing, IT projects, etc.).

Evidence of HF issues being addressed during changes.

Review impact of change on training and competencies.

Review previous changes to confirm they remain under control.

Consider how the changes are communicated to those people impacted by the change.

C. Guidance.

Present: The organization has established a change management process to identify whether changes have an impact on safety and to manage any identified risks in accordance with existing safety risk management processes.

Suitable: Triggers for the change management process are defined. The process also considers business related changes and interfaces with other organizations/departments. The process is integrated with the risk management and safety assurance processes. Responsibilities and timelines are defined.

Operating: The change management process is being used and includes hazard identification and risk assessments with appropriate risk controls being put in place before a decision to make the change is taken. HF issues have been considered and been addressed as part of the change management process.

Effective: The change management process is used for all changes that may impact safety, including Human factor issues, and considers the accumulation of multiple changes. It is initiated in a planned, timely, and consistent manner and includes follow up action that ensures the change was implemented safely. The change is communicated to those affected. Risk control and mitigation strategies associated with changes are achieving the planned effect.

4.3. Continuous Improvement

A. Indicators of compliance and performance.

The organization is continuously monitoring and assessing its SMS processes to maintain or continuously improve the overall effectiveness of the SMS.

B. Examples.

Review the information and safety data used for management decision making and continuous improvement.

Evidence of:

Lessons learned being incorporated into SMS and operational processes.

Best practices being sought and embraced.

Surveys and assessments of organizational culture being carried out and acted upon.

Data being analyzed and results shared with Safety Committees; and

Follow-up actions.

Information from external occurrences, investigation reports, safety meetings, hazard reports, audits, and safety data analysis all contribute towards continuous improvement of the SMS.

C. Guidance.

Present: There is a process in place to monitor and review the effectiveness of the SMS using the available data and information.

Suitable: The SMS is periodically reviewed, and the review is supported by safety information and safety assurance activities. Senior management and different departments are involved. The decision making is data informed. External information is considered in addition to internal information. External information is considered in addition to internal information.

Operating: There is evidence of the SMS being periodically reviewed to support the assessment of its effectiveness and appropriate action being taken.

Effective The assessment of SMS effectiveness uses multiple sources of information including the safety data analysis that supports decisions for continuous improvements.

Section 5 Safety Promotion

5.1. Training and education

A. Indicators of compliance and performance.

There is a training program for SMS in place that includes initial and recurrent training. The training covers individual safety duties (including roles, responsibilities, and accountabilities) and how the organization's SMS operates.

There is a process in place to measure the effectiveness of training and to take appropriate action to improve subsequent training.

Training includes human and organizational factors including just culture and non-technical skills with the intent of reducing human error.

B. Examples.

Review the SMS training program including course content and delivery method.

Check training records against the training program.

Review how the competence of the trainers is being assessed and maintained.

Training considers feedback from external occurrences, investigation reports, safety meetings, hazard reports, audits, safety data analysis, training, course evaluations, etc.

Review how training is assessed for new staff and changes in position.

Review any training evaluation.

Check that the training includes human and organizational factors.

Ask staff about their own understanding of their role in the organization's SMS and their safety duties.

Check that all staff are briefed on compliance.

C. Guidance.

Present: There is an SMS training program in place that includes initial and recurrent training.

Suitable: The training covers individual safety duties (including roles, responsibilities, and accountabilities) and how the organization's SMS operates. Training material and methodology are adapted to the audience and include human factors. All staff requiring training are identified.

Operating: The SMS training program is delivering appropriate training to the different staff in the organization and is being delivered by competent personnel.

Effective: SMS training is evaluated for all aspects (learning objectives, content, teaching methods and styles, tests, etc.) and is linked to the competency assessment. Training is routinely reviewed to take feedback from different sources into consideration.

5.2. Training Quality Assurance

A. Indicators of compliance and performance.

There is a process that evaluates the individual's competence and takes appropriate remedial action when necessary.

The competence of trainers is defined and assessed, and appropriate remedial action taken when necessary.

B. Examples.

Review how competence assessment is carried out on initial recruitment and recurrently.

Check it includes safety duties and responsibilities, as well as compliance management.

C. Guidance.

Present: A competency framework is defined for all personnel, including trainers.

Suitable: There is a process in place to periodically assess the actual competency of personnel against the framework.

Operating: There is evidence of the process being used and being recorded.

Effective: The competence assessment program and process are routinely reviewed and improved. The competence assessment takes appropriate remedial action when necessary and feeds into the training program.

5.3. Safety communication

A. Indicators of compliance and performance.

There is a process to determine what safety critical information needs to be communicated and how it is communicated throughout the organization to all personnel, as relevant. This includes contracted organizations and personnel where appropriate.

B. Examples.

Review the sources of information used for safety communication.

Review the methods used to communicate safety information (e.g., meetings, presentations, emails, website access, newsletters, bulletins, posters, etc.).

Assess whether the means of communication is appropriate.

The means for safety communication is reviewed for effectiveness and material used to update relevant training.

Significant events, changes, and investigation outcomes are being communicated.

Check accessibility to safety information.

Ask staff about any recent safety communication.

Review whether information from occurrences is timely communicated to all relevant personnel (internal and external) and has been appropriately disidentified.

C. Guidance.

Present: There is a process to communicate safety critical information.

Suitable: The process determined what, when, and how safety information needs to be communicated. The process includes contracted organizations and personnel where appropriate. The means of communication are adapted to the audience and the significance of what is being communicated.

Operating: Safety critical information is being identified and communicated throughout the organization to all personnel, as relevant, including contracted organizations and personnel where appropriate.

Effective: The organization analyses and communicates safety critical information effectively through a variety of methods as appropriate to maximize it being understood.

Safety communication is assessed to determine how it is being used and understood and to improve it where appropriate.

Appendix 2 SRM Resources

2.1. Sources for Hazard Identification

A. Flight Operations Data Analysis (FODA) / Flight Data Monitoring (FDM)

B. Flight After Action Reports

C. Flight Risk Assessment Tools or FRATs

D. Maintenance Reports

E. SAFECOM Reports

F. Safety Surveys

G. Pilot Carding reports

H. SIE safety information exchange programs

I. Informal Safety Reporting

J. Observation of Maintenance Operations

K. Safety Culture Monitoring Through Surveys

L. Internal and External Safety Investigations

M. Ad-hoc Questionnaires on chosen Safety Issues

N. Safety/Inspector Workshops

O. Flight Operations Monitoring

P. External Accident reports

Q. CPARs for Contractors

R. Feedback from Human Factor/CRM training courses

2.2. FRAT Risk Models

A. PAVE: Pilot, Aircraft, enVironment, and External pressures

B. IMSAFE

Illness—Am I sick? Illness is an obvious pilot risk.

Medication—Am I taking any medicines that might affect my judgment or make me drowsy?

Stress—Am I under psychological pressure from the job? Do I have money, health, or family problems?

Stress causes concentration and performance problems.

Alcohol—Have I been drinking within 8 hours? Within 24 hours? As little as one ounce of liquor, one bottle of beer, or four ounces of wine can impair flying skills. Alcohol also renders a pilot more susceptible to disorientation and hypoxia.

Fatigue—Am I tired and not adequately rested? Fatigue continues to be one of the most insidious hazards to flight safety, as it may not be apparent to a pilot until serious errors are made.

Emotion—Have I experienced any emotionally upsetting event.

C. 5 Ps: Plan, Plane, Pilot, Passengers, Programming

2.3. Hazard Log Structure

A. Organizations should wherever possible maintain a centralized log of all identified hazards. The nature and format of such a log may vary from a simple list of hazards to a more sophisticated relational or access database linking hazards to mitigations, responsibilities, and actions (as part of an integrated safety risk management process). As a minimum, it is recommended that the following information be included in the hazard log:

Unique hazard reference number against each hazard

Hazard description

Indication of the potential causes of the hazard (safety events)

Qualitative assessment of the possible outcomes and severities of consequences arising from the hazard

Qualitative assessment of the risk associated with the possible consequences of the hazard.

Description of the risk controls for the hazard

Indication of responsibilities in relation to the management of the risk controls

A quantitative assessment of the risk associated with the possible consequences of the hazard.

Record of actual incidents or events related to the hazard or its' causes.

Risk tolerability statement

Statement of formal system monitoring requirements

Indication of how the hazard was identified.

Hazard owner

Assumptions

Third party stakeholders

2.4. Hazard Log

Operation / System			
Hazard No.			
Hazard Description			
Safety Events (Causes or Threats)			
Potential Outcomes (and Associated Consequence Magnitudes)			
Risk Controls (Barriers and Mitigations)			
No.	Description		Responsible
1			
2			
3			
4			
5			
Risk Assessment (Worst Foreseeable Scenario – i.e. Highest Risk)			
Hazard Frequency			
Outcome Likelihood			
Consequence Severity			
Risk			
Management Approval	Name:	Post:	Signature:
Relevant Previously Reported Incident Data			
Safety Performance Monitoring Requirements			
No.	Description		Responsible
1			
2			
3			

Figure 1 Sample Hazard Log Template