2019
AVIATION SMS GUIDE

U.S. FOREST SERVICE

FIRE AND AVIATION MANAGEMENT

Revision Control

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1 - Introduction

1.1 Background

An Aviation Safety Management System (ASMS) is a quality management approach to controlling risk. It provides the organizational framework to construct and support a sound safety culture that actively controls its risk exposure. With increased aviation activity and decreased resources, the ASMS pushes the limits of current safety strategies and practices by developing and implementing a structured management system to control risk and meet legal responsibilities in aviation operations.

The goal is to develop a safety culture that achieves and maintains a zero-accident rate. A highly successful safety culture understands that every person in the organization accepts that safety is a conscious and ongoing mindset as opposed to simply a box to be checked. As Safety is a sometimes considered a dynamic non-event, the capability to continuously seek out and eliminate latent defects within our system and culture must be maintained. By being proactive, we eliminate potential causal factors that could lead to future accidents.

1.2 Scope of the Aviation Safety Management System

The purpose of this guide is to assist in fulfilling the requirements of FSM 5700 with respect to the implementation of Aviation Safety Management Systems (ASMS). This guide provides best practices in the application of ASMS for the Forest Service and its service providers.

The ASMS shall comprehensively examine the functions of the Forest Service and the operational environment to identify hazards and analyze associated risks. The specific functional components include:

(a) Safety management

(b) Organization and personnel

(c) Training and proficiency

(d) Flight operations

(e) Aircraft equipment requirements

(f) Aircraft maintenance

(g) Operational policies and procedures

(h) Emergency accident/incident response

(i) Environmental management

(j) Occupational health and safety

(k) Security

(l) Production vs Protection

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, with corresponding policy found in the FSM 5700. This Guide contains best practices for Safety Management Systems in the aviation program, thus the terms "may" and "should" indicate a best practice or industry standard that allows some discretion in execution.

1.2.1 ASMS Structure and Organization

There are four components comprising the Agency's ASMS; each component is an essential piece of a comprehensive safety management system.

- Safety Policy
- Safety Risk Management
- Safety Assurance
- Safety Promotion

1.2.2 References

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

- FSM 5700 Aviation Management Manual
- FSH 5709.16 Aviation Management Handbook
- FAA Advisory Circular 120 – 92b (or current version)
- International Civil Aviation Organization (ICAO) System Management Manual Document 9859
- FSM 6700 Safety and Health Program

1.3 External Certifications

The Forest Service is working to achieve International Standard for Business Aviation Organization (IS-BAO) certification for the ASMS.

The International Business Aviation Council (IBAC) introduced the IS-BAO program in 2002 to foster standardized, safe, and highly professional aircraft operations. IS-BAO is a code of best practices. Agencies implementing IS-BAO may obtain a Certificate of Registration from IBAC, demonstrating compliance to a recognized international standard. Certificates of Registration are issued by IBAC to agencies that demonstrate compliance through successful completion of a third-party industry audit by an IBAC Accredited Auditor. In 2019, the agency re-certified its GSA "Gold Standard" status; a critical step in the registration process.

The WO Branch Chief of Aviation Safety Management System is responsible for submitting applications and maintaining the Interagency Committee for Aviation Policy (ICAP) gold standard for US Forest Service Aviation Safety program.

2 - Safety Management Policy

2.1 Safety Commitment and Responsibility

The Forest Service is committed to developing, implementing and continuously improving the aviation operation. Our number one job is to protect our most valuable resource—our employees. Unless we do that, we cannot be a world-class leader in natural resource management. Every line officer, manager, supervisor, and employee has the responsibility to manage risk exposure. That means identifying and mitigating hazards, refusing to accept unnecessary risk, and making risk-related decisions at the appropriate level.

2.1.1 Chief's Safety Intent

The Chief provides employees with an annual leader's intent through various means. In addition, specific intent for aviation safety is relayed through the aviation accountable executives SMS Statement, which is available on the USFS Aviation Website.

2.2 Aviation Risk Management Policy

Management has defined policy and doctrine in FSM 5700 that conveys aviation safety expectations and objectives to employees. Aviation safety policy in FSM 5700 addresses roles, responsibilities, and authorities regarding aviation safety at each organizational level. While all members of the organization must know their responsibilities and be both empowered and involved with respect to safety, the ultimate accountability for the safety of the system cannot be delegated down from top management. Executive management involvement is a key requirement in SMS policy documentation. For more information on SMS: https://www.faa.gov/about/initiatives/sms/reference_library/policy_and_requirements/

2.3 Safety Planning

This Guide is supplemented by the National Aviation Safety and Management Plan to meet the safety objectives described in the agency safety policy. The information provided here is intended to comprehensively define the ASMS, but requires periodic review to ensure continuous improvement is sustained. As such, this Guide shall be reviewed biennially at a minimum by the BC-ASMS in conjunction with the National Aviation Safety Council. The NASC has responsibility to ensure the review and approval process is completed.

2.4 Key Personnel and Safety Accountabilities

2.4.1 Accountable Executive (AE)

The Accountable Executive is the Deputy Chief, State and Private Forestry. The AE has the overall responsibility for safety performance and shall designate resources essential to effectively implement and maintain the ASMS.

2.4.2 Director, Fire and Aviation management

Responsible for agency aviation safety and accountable for the oversight of the Safety Management System. This includes setting goals and objectives, and providing the necessary resources essential to the implementation, maintenance and effective functioning of the ASMS.

In addition to the responsibilities in FSM 5704, the Director may be delegated oversite of AE accountabilities. This includes support for, and execution of, the processes and procedures defined in this guide. The Director ensures that the ASMS program is capable of:

(a) Ensuring that processes needed for the ASMS are established, implemented and maintained
(b) Reporting the performance of the ASMS to the organization
(c) Ensuring the promotion of safety awareness and safety requirements throughout the agency

2.4.3 Deputy Director, Aviation, Operations, and Risk Management

Responsible to the Director, Fire and Aviation Management. In addition to the responsibilities in FSM 5704, the Director may be delegated oversite of AE accountabilities.

2.4.4 Assistant Director Doctrine, Learning, Risk Management

Responsibility for oversight of the fire and aviation program's safety performance and shall designate resources essential to effectively implement and maintain the Aviation ASMS, in addition to the responsibilities listed in FSM 5704. In addition, may be delegated direct management responsibilities as listed in 2.6.2.

2.4.5 Assistant Director Aviation

Shall coordinate with the AD-RM and BC-ASMS to ensure that safety policy and procedures are adhered to with all aviation operations. Additional responsibilities are listed in FSM 5704.

2.4.6 Branch Chief Aviation Safety Management System

The Aviation Risk Management Specialist who works directly for the Assistant Director, Doctrine, Communications and Risk Management. Monitors all aspects of the safety system described in this guide and acts with the authority of the Director, FAM in all matters regarding aviation safety, and can designate any delegated resources to accomplish USFS stated safety goals and objectives. In addition to the responsibilities listed FSM 5704, safety specific responsibilities of the BC-ASMS are:

(a) Maintain safety documentation; specifically, this guide will be maintained as a controlled document and the requirements listed in section 2.9
(b) Develop safety goals and objectives for the accountable executive's consideration
(c) Develop emergency response planning tools
(d) Monitor ASMS performance and create performance reports for other managers and the accountable executive, as directed
(e) Facilitate hazard identification and risk management
(f) Determine the need for and coordinate development of required safety training materials prescribed by national, state, and local laws and regulations or industry best practices
(g) Receive, evaluate, and process all employee hazard reports in accordance with this manual's requirements and recommend action to mitigate risk

(h) Coordinate all national aviation safety program activities and act as focal point for ASMS between the Forest Service, its contract service providers, as well as applicable governmental agencies

(i) Monitor safety concerns in the aviation industry and their perceived impact on USFS operations

(j) Act as FOQA program manager

(k) Maintain a National Aviation Safety Center for accomplishment of the ASMS program requirements, library, and virtual electronic resources

(l) Maintain the Safety chapters of the National Aviation Safety and Management Plan for updates at least every two years

(m) Coordinate aviation mishap investigations and inquiries; manages National Aviation Safety Officers and Air Safety Investigators (ASI). Designates Qualitied Technical Investigators (QTI) as appropriate

2.4.7 Branch Chief Airworthiness

Responsible to the Assistant Director, Aviation, for the management and oversite of airworthiness standards for all WCF, contract, leased, and cooperator aircraft. Additional responsibilities are listed in FSM 5704.

2.4.8 Branch Chief Aviation Operations

Acts with the authority of the Assistant Director, Aviation in all matters regarding Forest Service aviation operations, to include but not limited to operations planning, operational safety, contract compliance audits and reviews, program audits and reviews and operational support to aviation safety. Additional responsibilities are listed in FSM 5704.

2.4.9 Branch Chief Pilot Standardization

Responsible to the Assistant Director, Aviation, for the management of pilot standardization for all agency and contract pilots. Additional responsibilities are listed in FSM 5704.

2.4.10 Branch Chief Aviation Business Operations

Responsible to the Assistant Director, Aviation, for the management and supervision of aviation business operations. Additional responsibilities are listed in FSM 5704.

2.4.11 Branch Chief Aircraft Program Management

Responsible to the Assistant Director, Aviation, for the management and oversite of WCF large airtanker aircraft. Additional responsibilities are listed in FSM 5704.

2.4.12 National Aviation Safety Officers

Responsible to the Branch Chief Aviation Safety Management System (BC-ASMS). Delegated tasks from the BC-ASMS to accomplish stated SMS goals and objectives. Designated as Air Safety Investigators by position and assigned to lead and carry out agency investigative processes for aircraft mishaps.

2.4.13 Regional Aviation Safety Manager (RASM)

In addition to the responsibilities listed FSM 5704, Regional Aviation Safety Managers foster a safety culture through the development of flexible, reporting, learning, and just cultures that result in the establishment and maintenance of a high reliability organization. The RASM position is on the forefront of establishing and implementing ASMS. Regions will ensure that qualified RASMs remain a key position and the recruiting and hiring of such individuals remains a high priority. In accordance with industry best practices, the RASM shall not report to the RAO, ensuring safety duties and responsibilities are separate from the influence of operational duties and decisions.

2.4.14 Forest Health Protection, Aviation Safety Manager (FHP-ASM)

Under the Director of Forest Health Protection, State and Private Forestry, Washington Office, the Forest Health Protection Aviation Safety Manager (FHP ASM) is responsible for coordinating safety matters for Agency personnel and cooperators conducting FHP aviation activities such as aerial reconnaissance, aerial application, and remote sensing. In addition to the responsibilities listed FSM 5704, the FHP ASM is responsible for fostering and promoting a positive safety culture through incorporating the elements of ASMS into all FHP aviation operations, including coordination with the Regional Aviation Safety Manager (RASM) on aviation safety and accident prevention matters, ensuring compliance with aviation safety policies and procedures, participating in quality assurance oversight, promoting ASMS through training and awareness, and application of operational risk management processes.

2.4.15 National Aviation Safety Council (NASC)

The National Aviation Safety Council (NASC) is a critical part of the agency ASMS and is utilized as a resource to provide expertise, guidance and leadership in the facilitation of the aviation safety risk management process. The NASC is a chartered group, tasked with monitoring activities to ensure control of safety risks and consequences of hazards pertaining to FS aviation operations. The charter is located at:
http://fsweb.wo.fs.fed.us/fire/fam/aviation/charters/rasm_dm_charter.pdf

2.4.16 Regional Aviation Officer (RAO)

In addition to the responsibilities listed FSM 5704, Regional Aviation Officers are responsible for fostering and promoting a positive safety culture through incorporation of ASMS elements into Regional aviation operations. This includes but is not limited to coordination with the Regional Aviation Safety Manager (RASM) and FHP NASM on aviation safety and accident prevention matters, ensuring compliance with aviation safety policies and procedures, participating in quality assurance oversight, promoting ASMS through training and awareness, and application of operational risk management processes.

2.4.17 Aviation Manager

Aviation Managers at all levels are required to:

(a) Monitor conditions to ensure safe operation of agency aircraft
(b) Actively support the ASMS

(c) Ensure assigned employees are trained and actively participating in the ASMS
(d) Actively identify and assess risk exposure and safety performance at the appropriate level.

2.4.18 Supervisor

Supervisor's safety responsibilities include:

(a) The supervision of employees, and the provision of resources for those employees to safely carry out their assigned duties.
(b) Integrating ASMS activities into their assigned duties and responsibilities.

2.4.19 All Employees

All Forest Service employees shall be responsible for aviation safety and shall take timely action to promote safety. The following best practices are expected:

(a) Every employee shall strive for the highest level of safety, while identifying hazards, assessing risks and mitigating risks to the lowest acceptable level.
(b) 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.
(c) 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.
(d) Every employee shall utilize 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.
(e) Aviation personnel must be qualified for the positions and functions they are assigned to perform and conduct their duties in accordance with all agency policies, procedures, and government regulations.

2.5 Emergency Preparedness and Response

Forest Service local units shall establish procedures in an Emergency Response Plan to:

(a) Coordinate and plan the response to aviation accidents and incidents; and
(b) Execute periodic exercises of mishap response plans.

Emergency response information may be detailed separately in the Interagency Aviation Mishap Response Guide, or other documents which contains all of the elements necessary for effective aircraft mishap, search and rescue response. The guide shall be updated annually at a minimum.

Emergency response preparedness includes continual updating of information, training for employees, and simulation exercises (emergency response drills).

2.6 Documentation

The agency maintains ASMS information, in paper or electronic form, contained in various documents that includes but is not limited to:

(a) Safety Management System Guide
(b) Safety goals and objectives (Aviation plans)
(c) Reported hazards (Aviation Risk Management Workbook, MASP, JHA, SAFECOM)
(d) Agency risk exposure (Aviation Risk Management Workbook)
(e) Internal and external QA audit performance (program reviews, compliance inspections, annual reports)
(f) Corrective actions pertinent to risk assessments, audits and Accident Review Boards (action plans)
(g) Change management actions (Aviation planning documents at all levels)
(h) Holistic ASMS performance (Program reviews, annual report, external audits)
(i) Safety committee meeting activities (agendas, minutes, resulting actions, etc.)
(j) SAFECOMs (See section 4.3.2)

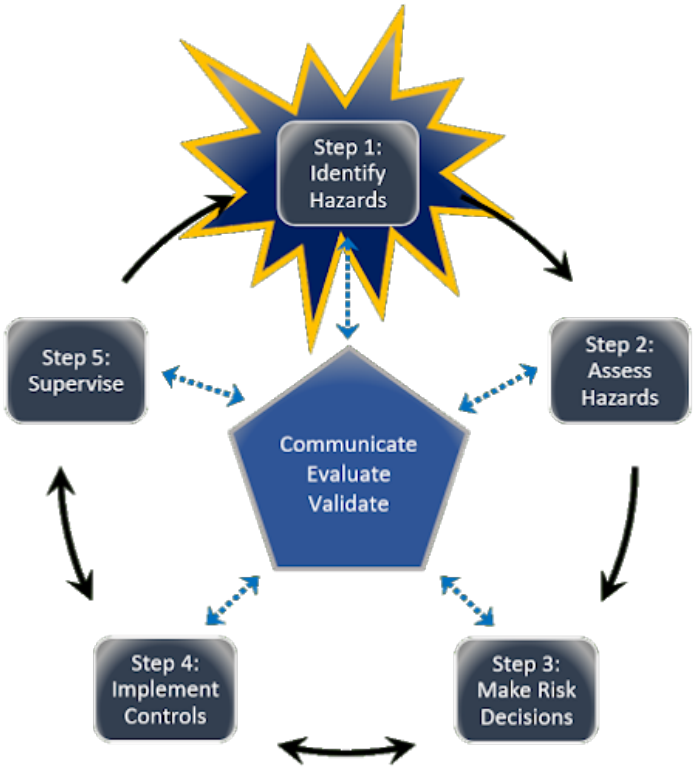
All documentation and/or records, either in paper or electronic form, shall be legible, dated (with dates of revisions), readily identifiable, maintained in an orderly manner, and retained for a specified period as determined by the agency. The current versions of relevant documents will be made available at all locations where operations essential to the effective functioning of the ASMS are performed and obsolete documents and/or records will be promptly removed from all points of use or otherwise assured against unintended use.

All records must be managed in accordance with FSM 6200 Chapter 30, and pertains to all Forest Service records, regardless of medium, that are created, collected, processed, used, stored, and/or destroyed by the Agency or designated agents. Each Forest Service unit and staff is required to meet the requirements of this policy.

3 - Safety Risk Management

Risk is an expression of the impact of an undesired event in terms of severity and likelihood. Throughout the risk management process, hazards are identified, risks are analyzed, assessed, and prioritized, and results are documented to assist in 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. The agencies 5 step process aligns with current policy guidance (Incident Response Pocket Guide (IRPG), Interagency Helicopter Operations Guide (IHOG), etc.) and is taught via instructional material found in Interagency Aviation Training (IAT) courses including A-205 and A-311.

1. Identify Hazards
2. Assess Hazards
3. Make Risk Decisions
4. Implement Controls
5. Supervise



In addition, the FAA AC120-92b (or most current version) involves a seven-step process for the complete cycle of risk management; more information on this industry best practice is located at:

https://www.faa.gov/documentLibrary/media/Advisory_Circular/AC_120-92B.pdf

Using various techniques described in this section, the agency has defined acceptable and unacceptable levels of safety risk. 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 be found in the *Incident Response Pocket Guide* (IRPG), the *Interagency Standards for Fire and Fire Aviation Operations* (Red Book), or the *Interagency Helicopter Operations Guide* (IHOG).

Risk management (RM) can be divided into three levels.

1. **Time Critical.** This method of risk management is a rapid planning process requiring mental or verbal review of a situation using an Operational Risk Management (ORM) process without necessarily recording the information. Many of the skills used in this context are applicable when deliberate risk management has occurred and crews must manage risk in a dynamic situation. Note that "Time Critical" does not mean "hasty" or "uninformed."

2. **Deliberate.** This 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 mission aviation safety plans (MASP) and job hazard analysis (JHA).

3. **Strategic/Programmatic.** Strategic Risk Management is conducted at the highest levels of the organization, and requires more sophisticated techniques and professional reviews. A system or task description should completely explain the interactions among the software, hardware, environment, and live ware that make up the system with sufficient detail to identify hazards and perform risk analysis. An example 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. Consideration for immediate and future risks resulting from proposed changes made without utilizing a process should be evaluated. The strategic process produces a permanent record of findings and decisions used for long term planning, organizational decision-making and as authoritative training resources.

⇒ **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 that urgent action is required.

3.1 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:

- Any interactions with other systems in the air transportation system (e.g. airports, airspace, UAS)
- The functions described in section 1.2 of this manual
- Employee tasks required to accomplish the functions in section 1.2 of this manual
- Required human factors considerations of the system (e.g. cognitive, ergonomic, environmental, occupational health and safety) for operations and maintenance
- Hardware components of the system
- Software components of the system
- Related procedures that define guidance for the operation and use of the system
- Training requirements (existing and potential)
- Ambient environment and cost/benefit analysis of mitigations
- Operational environment and assessment of quality of the program
- Maintenance environment
- Contracted and purchased products and services
- The interactions between items or issues defined in the list above
- Any assumptions made about the systems, system interactions, and existing safety risk controls/mitigation.
- Staffing (management structure and fulfillment of positions)
- Equipment/technology changes to mission sets
- Fiscal changes to support

In addition to the list above, consideration should also be given to risks associated with when systems or their components are altered without examining the effects today and in the future.

3.1.1 Management Required Action

An action plan is required as the implementation tool for strategic and deliberate program risk assessments. The BC-ASMS 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 purview to 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.

3.2 Management of Change in Terms of Risk

The WO function of Doctrine, Communications and Risk Management will identify and determine acceptable safety risk for changes within the organization which may affect established processes and services by new system design, changes to existing system designs, new operations/procedures, or modified operations/procedures.

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:

- New system designs
- Changes to existing system designs
- New operations/procedures
- Modified operations/procedures

The Change Management and Implementation Guide 2011 can be found at:
http://www.fs.fed.us/fire/aviation/av_library/Change%20Management%20and%20Implementation%20Guide%202011%20Final_w_Cover_toc.pdf

3.3 Hazard Identification

3.3.1 Identify Hazards and Consequences

Potential hazards may be identified from a number of internal and external sources. Hazard scenarios may address the 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 following procedures:

3.3.2 Hazard Identification Requirements and Procedures

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

(a) System and process hazards as described in section 3.1 will be proactively identified and communicated through ASMS activities by all managers

(b) All employees are responsible for continued vigilance to identify hazards they observe or experience via the performance of their duties

(c) SAFECOM reports form (FS-5700-14) will be used to increase communication and awareness of potential hazards; (ref section 4.3.1)

3.4 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) RASMs will track hazard reports, assign appropriate risk prioritization, and provide dissemination to the field users

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

3.5 Safety Risk Management Procedures

Safety risk management is the core component of the safety management system. 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:

1. Time
2. Cost
3. Effectiveness
4. Feasibility

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:

- Avoiding costly losses in the decision making process
- Ensuring that all aspects of the risk problem are identified and considered when making decisions
- Ensuring legitimate interests are considered
- Providing the decision makers with tools to make good decisions
- Making decisions easier to explain
- Providing a standardized set of terminology used to describe risk issues contributing to better communication about risk issues
- Providing significant savings in time and money

3.5.1 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:

1. **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.
2. **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.

3. **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.

4. **Integrate risk management at all planning levels.** Risk management should be used from the initial stages of project/mission planning through the implementation stage.

Risk Assessment Matrix –Risk Assessment Matrix

	Severity			
Likelihood	Negligible IV	Marginal III	Critical II	Catastrophic I
Frequent A				
Probable B				***HIGH 4***
Occasional C			***Serious 3***	
Remote D		***Medium 2***		
Improbable E	***Low 1***			

3.5.2 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?
(d) What percentage of the time is the suspect equipment or the questionable procedure in use?

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

Likelihood Scale Definitions

Frequent	Likely to occur or continuously experienced.
Probable	Will occur several times, will occur often.
Occasional	Likely to occur sometime or several times.
Remote	Unlikely to occur, but can reasonably be expected to occur.
Improbable	So unlikely, it can be assumed it is possible, but probably will not occur.

3.5.3 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 general 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 and/or media interest?

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

Severity Scale Definitions

Catastrophic	Results in fatalities and/or loss of the system
Critical	Severe injury and/or major system damage
Marginal	Minor injury and/or minor system damage
Negligible	Less than minor injury and/or less than minor system damage

3.5.4 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.

Risk Level

Risk Level	Description
High 4	The combination of severity and likelihood indicate the hazard has a greater than 50% chance of exceeding control measures and the result will be critical or worse. Benefit to risk must be carefully weighed and planners ensure that: 1) emergency response resources are positioned for immediate use, 2) approval is made by the highest official in the local organization, and 3) crewmembers are well rested, briefed and aware of the known threats and their controls.
Serious 3	Risk is high enough that there is uncertainty as to whether the mission can be accomplished without an accident and/or loss of life or serious injury. Hazards may or may not be able to be mitigated.
Medium 2	Degree of risk is such that the mission can almost certainly be accomplished safely. Hazards exist, but can be mitigated.
Low 1	The risk involves little or no impact on mission accomplishment. Hazards are those normally associated with flight (possibility of bird strike, mechanical, malfunction, etc.).

3.5.5 Risk Tolerability Protocol, Line Authorities and Controls

For each level of risk, Low, Medium, Serious, 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.

Risk Tolerability Decision Matrix Example

Recommended Management Level for Risk Decisions

The following are *recommended* management levels in which to elevate risk decisions. These are suggested decision levels but can be delegated at the discretion of the accountable officer.

Risk Level	Fire	Non-Fire
High	Incident Commander or Operations Sections Chief	Line Officer/Manager
Serious	Incident Commander or Operations Sections Chief	Line Officer/Manager
Medium	Air Operations Branch Director	Line Officer/Manager
Low	Base Manager	Line Officer/Manager

3.5.6 Safety Risk Control and Mitigation

While the risks inherent throughout aviation operations will be continually assessed, experts within the agency can implement one or more 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) **Mitigation**. 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) **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 with the continued goal of reducing overall risk to as low as reasonably practical.

3.5.7 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) Controls shall be monitored using the risk assessment worksheet and action plan as documentation

(c) Programmatic Risk Assessments shall be maintained indefinitely in the National Aviation Safety Center library and as needed at the Region level

3.5.8 Agency Risk Profile

The objective of the agency risk profile is to identify prominent risks and to evaluate the controls employed. The agency risk profile is determined by reviewing the Aviation Risk Management Workbook and Strategic/Programmatic Risk Assessments. 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 paper copy (Risk Assessment Workbooks) or on the Aviation Safety Center website: http://www.fs.fed.us/fire/av_safety/index.html

(b) Risk systems tracked include (but are not limited to) Aircraft, Flight Operations, Airworthiness, Facilities, Human Factors, Personnel 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 in the National Aviation Safety Center safety library

(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 (Fire, Law Enforcement, Research, Forest Health, etc)

3.5.9 Flight Risk Analysis and Operational Risk Analysis

Every flight has hazards and some level of risk associated with it. It is critical that management and pilots are able to differentiate, in advance, between a low risk flight and a high-risk flight using a risk assessment tool that allows pilots, managers and dispatchers to see the risk profile of a flight in its planning stages. A Flight Risk Assessment Tool (FRAT) enables proactive hazard identification, is easy to use, and can visually depict risk. It is an invaluable tool in helping flight crews make better go/no-go decisions and should be a part of every flight.

When the risk for a flight exceeds the defined acceptable level, the flight will be further evaluated and risk decisions made by appropriate leadership. A defined acceptable level of risk is a risk exposure that is deemed acceptable to an organization or accountable manager.

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

4 - Safety Assurance

Safety management requires feedback on safety performance to perpetuate the safety management cycle. Through monitoring and feedback, ASMS performance can be evaluated and any necessary changes to the system effected. In addition, safety assurance provides employees an indication of the level of safety performance affected by the safety management system. The agency's Management Review and Quality Assurance Guide (MRQA) provides more guidance.

The safety assurance objectives for the agency are designed using the following principles and include procedures for monitoring the performance of critical aspects of the organization. Safety assurance components are comprised of these elements:

- Monitoring of risk and effected controls
- Internal evaluation and external audits
- Corrective action requirements
- Safety performance analysis
- Management reviews

4.1 Monitoring Risk and Controls

"Can do" remains an organizational strength; but when "can do" becomes "make do," Forest Service employees must not be asked to take unacceptable risks. We intend to adopt *QUALITY* as a primary cultural value, thereby improving decision-making, and inserting more effective oversight with controls that maintain high standards in the program. In essence, Quality Assurance is determining gaps based on non-compliance with regulatory or organizational requirements. In comparison, Safety Assurance is looking at weakness in the organizational system which raises the exposure to risk.

Like the quality assurance process, the safety assurance process includes requirements for analysis, documentation, auditing and management review to ensure that performance criteria are met. Safety assurance specifically monitors the effectiveness of safety risk mitigations.

There are three primary strategies we use to maintain a healthy safety culture for Aviation Management.

- Safety Assurance (SA) policy and doctrinal principles
- Quality Assurance (QA) as found in the National Aviation Safety Management Plan

- A training curriculum (talk-the-talk) backed by constant and consistent behaviors (walk-the-walk) that demonstrate management commitment

While top-level leadership and vision is crucial for a good SA program to work, middle management and field level involvement and commitment to the principles of ASMS/QA are also required. Field employees are the primary force for continuously improving the system, refining and revising work processes, and coordinating through all of the organization's systems to maintain and improve the quality of aviation program.

4.2 Internal Evaluation Program (IEP) and External Audits

4.2.1 Continuous Monitoring

The agency monitors organizational performance utilizing a proactive internal evaluation program designed with the following objectives:

- Assess conformity with internal and interagency requirements
- Measure the effectiveness of safety risk controls
- Monitor products and services received from vendors and contractors
- Assess agency system and process performance
- Identify hazards and deficiencies

4.2.2 Internal Evaluation Program: Inspectors, Standardization Officers, Auditors

Aviation Safety has responsibility for Safety Assurance. Agency (IEP) personnel include members of the NASC, Inspector Pilots, Aviation Safety Inspectors, Airworthiness and Avionics. All inspectors 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 auditor 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).

4.2.3 Internal Evaluations

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.

1. *Aviation Management Reviews*

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.

2. *Site Visits*

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 Assistance Team (ASAT), aviation base operational reviews, and cooperator aviation program reviews address this purpose.

3. *Aviation Program Evaluation*

Program evaluation should be conducted as part of to the planning process for aviation operations and periodically reviewed to address changes in process or policy. Program reviews meet the requirement for ASMS Safety Assurance.

If serious violations of Federal Aviation Regulations (FARs) are uncovered during these internal evaluations, then the Director, FAM will determine if notification to FAA officials for self-disclosure is required.

Formalized internal evaluation procedures and responsibilities are established by policy in FSM 5719, and pursuant to specific agency-wide policies established for management reviews in FSM 1410.

Any discovered findings, or discrepancies that affect aviation safety shall be thoroughly documented by the inspection team. All corrective actions should be included in the finding documentation.

Copies of standard evaluation checklists are maintained by the BC-ASMS in the National Aviation Safety Center safety library.

4.2.4 Aviation Safety and Technical Assistance Team (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 provide safety assurance through communication from the field to Fire and Aviation leadership and to assist and review aviation operations during ongoing wildland fires. An ASTAT should be requested through the agency chain of command and operates under a delegation from the appropriate state/regional aviation safety manager or multi-agency coordinating group. Team composition should be interagency whenever possible. Formal written reports are not mandatory, but may be provided to the appropriate safety manager if requested. Requested reports should include the following information:

- Purpose and Objectives
- Listing and Method of Personnel Contacted
- Findings, Commendations, and Recommendations
- Follow up Actions

An ASTAT should consist of:

- Aviation Safety Manager
- Operations Specialist (helicopter and/or fixed-wing)
- Aviation Dispatcher (optional)
- Pilot Inspector (optional)
- Maintenance Inspector (optional)
- Avionics Inspector (optional)

When an ASTAT has been established and given an assignment, the following protocols should be used:

1. Prior to visiting any fixed-wing and/or helibase, the team must make positive contact with the receiving Forest, District Office, Supervisor, Line Manager, or Incident Commander to establish communication and schedule an in-briefing.

2. When traveling throughout the area visiting incidents, it is the team's responsibility to report activities, relate issues, provide feedback, and generally coordinate with the individual the ASTAT has been directed to report to.

3. Before leaving an Incident, Forest, or District, the team must provide an out briefing to the Air Ops and Air Support, Operations, and the local Line Manager as appropriate.

4. If requested by the Region, the ASTAT team lead will submit a formal written report or After Action/Lessons Learned to the Aviation Staff at the regional level concerning activities conducted by the ASTAT team.

4.2.5 Aviation External Audits

Coordination for external aviation audits shall be requested through the BC-ASMS. 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.

4.3 Internal Evaluation Corrective Action Requirements

When an internal evaluation is completed, each finding (discrepancy) must be analyzed and a corrective action plan 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 entirely appropriate to perform a risk assessment for significant findings and determine if significant risk is present as a result of the discovered deficiency.

A corrective action plan for each finding shall be developed and will 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) 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

(b) BC-ASMS is responsible for the review of corrective actions that affect safety assurance

(c) 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. This assurance check is normally assigned to a RASM for completion.

4.3.1 Flight Operational Quality Assurance (FOQA)

Flight Operational Quality Assurance (FOQA) is defined as a program to improve flight safety by providing more information about, and greater insight into, the total flight operations environment through selective automated recording and analysis of data generated during flight operations. Analysis of FOQA data can reveal situations that require improved operating, training, and maintenance procedures, practices, equipment, and infrastructure.

The USFS FOQA program will not be used in legal enforcement actions against an operator or its employees. All data will be de-identified and under the proprietary guardianship of the Branch Chief for the Aviation Safety Management System (BC-ASMS).

The core objective and intent of the USFS FOQA program is to facilitate the free flow of safety information. The FOQA program will:

1. Collect operational flight data

2. Develop methods to analyze the collected flight data, such as triggered events and routine operational measurements

3. Establish procedures for comparing the collected data with established procedures and standards and the use of analyzed data in formal awareness and feedback programs to enhance safety in the following areas:

a. Flight procedures

b. Flight training procedures and qualification standards

c. Crew performance in all phases of flight

d. Air traffic control procedures/Airspace coordination

e. Aircraft maintenance and engineering programs

4. Perform trend analyses of FOQA data to identify potential problem areas, evaluate corrective actions, and measure performance through monitoring Safety Performance Indicators (SPI).

FAA Guidance on FOQA can be found at:

https://www.faa.gov/regulations_policies/advisory_circulars/index.cfm/go/document.information/documentID/23227

4.3.2 Reporting and Feedback System (SAFECOM)

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 to identify emerging hazards, share critical safety information through alerts and bulletins, access performance of risk controls in the operational systems and identify training needs. It is a tool used to encourage the reporting of 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.

The SAFECOM system is **not** intended for initiating punitive actions. SAFECOM data will not be forwarded to the FAA for action. The goal of the SAFECOM system is to create a "Reporting Culture" encouraging open and honest reporting of our mistakes and failures, as well as our successes. We need to learn and share our experiences, both good and bad, to improve our effectiveness and execution. The SAFECOM system is available to all Agency personnel electronically through the Internet at https://www.safecom.gov. Discussions of SAFECOMs at

local level meetings encourage program participation and active reporting. SAFECOMs should be utilized in tailgate safety sessions, after action reviews, and briefings only after they have been properly managed through the system. While it is imperative that problems and issues be addressed at the local level, it is beneficial to share problems and solutions systems-wide.

Submitting a SAFECOM is **not** a substitute for "on-the-spot" correction(s) to a safety concern. It is imperative that safety problems and issues be addressed with everyone involved at the local level and if necessary elevated to the regional/state level and then documented in a SAFECOM (Attachment Form FS-5700-14). It is a tool used in the documentation, tracking and follow-up corrective action(s) related to a safety issue.

While it is imperative that operation managers are notified of safety issues immediately, this notification should be in a manner that provides for privacy and confidentiality. Managers at all levels are responsible for protecting personal data and sanitizing SAFECOMs prior to general distribution and posting to the public.

The SAFECOM system contains Personal Identifiable Information (PII) which is subject to the Privacy Act of 1974, 5 U.S.C. § 552a that must be protected and safeguarded.

Incident Air Operations Units and Incident Communication Centers have no authority to receive SAFECOMs from the field or distribute this information. SAFECOMs are NOT suitable for general distribution until they have been managed by Regional and National Aviation Safety Managers. The SAFECOM system contains specific information concerning vendors, aircraft tail numbers, and pilot names that link them to specific acts. Therefore, only the public version of the SAFECOM may be distributed.

Misuse of SAFECOM information, even when unintentional, has occurred in the past. Misuse of the SAFECOM system jeopardizes the open and honest communication needed for the SAFECOM system to work effectively. The intent of this reporting system is for internal data gathering purposes only and must **not be utilized for punitive action**.

A SAFECOM **does not** replace the requirement for initiating a mishap report. Mishaps shall be reported immediately by the most expeditious means available in accordance with the local agency emergency response plan.

The SAFECOM system shall be promoted by all levels of management. SAFECOM system needs to be utilized appropriately in a non-punitive manner for the purposes of accident prevention. The Branch of Risk Management has responsibilities for monitoring the use and management of the system and ensuring accountability for system managers.

In order for SAFECOM's to be effective as an accident prevention tool, they should be reported as soon as possible to the agency with operational control of the aircraft at the time of the event. SAFECOMs can be submitted online at www.safecom.gov or via phone at 888-464-7427. Hard copies can be faxed to the Aviation Safety Center at 208-387-5735 or submitted through

the Unit/Forest Aviation Officer. SAFECOM system managers shall address SAFECOMs and make public within 7 days.

The following are examples of how SAFECOM information MUST NOT BE USED:

1. Claims
   - SAFECOM information is not intended to be used to support claims. All information gathered for this purpose must come from other sources.
2. Contracting
   - Managers must not address SAFECOMs in their daily diaries since the diaries are used by Contracting Officers. While safety events need to be documented in the daily diary, it is strictly prohibited to mention that a SAFECOM was filed or to attach a SAFECOM as a record.
   - Contractor performance evaluations. The Federal Acquisition Regulations (FARs) section 42.1503 addresses the government requirement for holding past performance information. The SAFECOM does not meet the requirements of the FARs as an acceptable past performance record. Therefore, SAFECOM records/data are not to be referenced when evaluating past performance for any contract solicitation.
3. Disciplinary Action
   - SAFECOM's are not to be used punitively in disciplinary actions against agency or contract employees or contractors. This includes Performance Evaluations, Pilot Evaluation Boards or Suspension/Revocation of a USFS Qualification Card.

4.3.3 E-Safety System

The (E-Safety System) is an enterprise application designed to combine Safety and Occupational Health (SOH) incident reporting and Worker's Compensation (WC) case management capabilities. The e-Safety system will fully integrate both SOH and WC program areas, allowing users to work within one system. Use of this system is mandatory. The e-Safety Intranet can be accessed at:

http://fsweb.wo.fs.fed.us/hrm/workers-compensation/index.php#two

4.4 Safety Performance Analysis

The National Aviation Safety Center Safety Library is the primary source of data for safety performance measurement and may be utilized by managers to evaluate risks and performance in their respective areas of responsibility.

The BC-ASMS analyzes data that has been acquired through the ASMS process to demonstrate the effectiveness of risk controls.

Additionally, using ASMS data, managers shall evaluate where improvements can be made to existing organization systems, processes, and procedures.

The following requirements are established to formalize safety performance analysis procedures and documentation:

(a) Utilizing the National Aviation Safety Center safety data, the BC-ASMS shall make reports available to managers

(b) SAFECOMs will be categorized and analyzed to facilitate trend identification

(c) The fiscal year Aviation Safety Summary will be prepared annually by the NASC and published for agency-wide dissemination

(d) SAFECOM summary reports should be prepared during the field/fire season and be disseminated via all practical means to maximize employee awareness

4.4.1 Safety Surveys

As a component of the annual ASMS management review or strategic risk assessments, the agency may conduct a survey of personnel focused on aviation operations and safety culture. The survey responses shall be collected and analyzed by the NASC and the BC-ASMS for review by the Director, FAM.

4.4.2 Safety Investigations

The sole objective of the internal investigation of a mishap involving agency and/or contract personnel, facilities, and equipment is the prevention of future accidents and incidents. Internal incident investigations are carried out in order to:

(a) Understand the events leading up to the occurrence;

(b) Identify hazards and conduct risk assessments;

(c) Make recommendations to reduce or eliminate unacceptable risks; and

(d) Communicate the safety messages to the appropriate stakeholders.

Aviation Mishap investigation is an assurance process and referenced in the FSM 5720. Processes for aviation mishap investigations are coordinated by the Office of Safety and Occupational Health (OSOH) and the BC-ASMS. Aviation investigative processes are described

in the Coordinated Response Protocol (CRP) Guide, Aviation Mishap Investigation supplement when a CRP is activated.

The Aircraft Mishap Investigation Guide (AMIG) (Appendix 1) will be used for all aviation mishaps. The AMIG details the processes required for aviation mishap investigations from notifications to the mishap review.

The information disclosed by aviation mishap investigation report, boards, and other mishap investigation processes as utilized for the purpose of improving and validating ASMS processes. Mishap data is one method for measuring the success rate of risk controls. One example of an industry metric to be considered is the aircraft accident rate which is determined by accidents per 100,000 flight hours.

Under party status rules all investigation processes and information are maintained by the NTSB investigator in charge (IIC). All documentation of evidence and release of information must be coordinated and routed through the NTSB IIC.

The Forest Service may also conduct a separate investigation in accordance with FSH 6709.11 through formal agreement, notification, and request to the NTSB. Only the NTSB determines probably cause of an aviation accident. Separate investigations must not interfere or jeopardize the NTSB investigation.

The DASHO will determine the investigation needs associated with and relevant to the reported mishap. In the event of incidents and accidents, the line officer of the unit experiencing the aviation mishap will be apprised of the determination for the type of investigation to be conducted. In the case of mishaps generating high public interest or those that have multiple serious injuries or fatalities, a Serious Accident Investigation Team may be established by the DASHO through OSOH. The BC-ASMS is authorized to determine the need for an aviation mishap investigation for the purpose of identifying systemic defects, developing recommendations and safety action items and producing lessons learned. Coordination with the Regional Aviation Safety Manager must occur throughout an investigative process.

Accidents, and incidents are defined by classification and by category. Accidents should be reported according to the local unit's emergency response plan.

4.5 Classification for Notification and Reporting

- **Serious Accident**: An accident that results in substantial property damage, serious injury or illness that requires immediate emergency medical care, or death. For aircraft accidents, the term "substantial damage" is per the definition in the NTSB Part 830 rules.

- **Accident**: An accident that results in minor property damage, or which results in minor injury or illness requiring medical care of a doctor, and meets the NTSB definition for a reportable event.

- **Incident**: Any other occurrence which may or may not result in injury or illness requiring first-aid care, or which may or may not result in property damage. In some cases, these Mishaps may have a high potential for causing death, serious injury, illness or damage to property if they recur; or that could have the potential for greater loss. The BC-ASMS, in conjunction with the RASM, determines when a mishap is to be classified as an Incident and if it is reportable to NTSB. A high reliability organization requires close attention to Incidents to formalize procedures.

4.6 Categories for Notification and Reporting

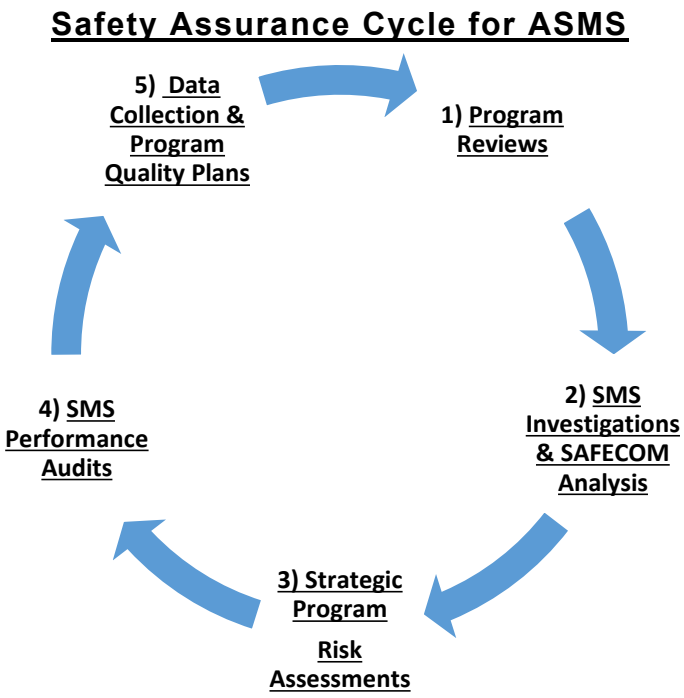
- **Aircraft**: Occurrences involving aircraft, whether in-flight or on the ground. This includes aircraft parked at the gate. In addition to reporting/notification guidelines in this manual, procedures in the local emergency response plan should be followed.

- **Employee**: Occurrences involving injury or illness to an employee. If the employee injury or illness is sustained in operations involving aircraft, ground support equipment, or facilities, report under those categories as well.

- **Facilities**: Occurrence involving this agency's facilities - example, fire or other catastrophe in a building owned or leased by USFS.

- **Ground Support Equipment (GSE)**: Property damage to GSE or caused by GSE. Also personnel injury or illness caused by GSE. If GSE is involved in an aircraft accident or incident, report under that category as well.

- **Non-Employee**: Occurrences involving injury or illness to either a contractor or volunteer, or other government representative. If injury or illness is sustained in operations involving aircraft, GSE, or facilities, report under that category as well.


Safety Assurance Cycle for ASMS
1) Program Reviews
2) SMS Investigations & SAFECOM Analysis
3) Strategic Program Risk Assessments
4) SMS Performance Audits
5) Data Collection & Program Quality Plans

5 - Safety Promotion

The safety efforts cannot succeed by mandate or strictly though implementation of policies. Safety promotion sets the tone and enhances the organization's policies, procedures and processes, providing a sense of purpose and direction.

Aviation Managers must make every effort to communicate objectives, as well as the current status of ASMS activities and significant events. Likewise, we must strive to create and maintain a channel of upward communication in an environment of openness.

Safety promotion includes:

(a) Training and Education

(b) Awards

(c) Safety Communication

5.1 Training and Education

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

The specific requirements are outlined in the sections below.

5.1.1 Safety Training for Employees

All Forest Service employees (FSM 5720.46) share responsibility for aviation safety. Training is crucial for a strong safety culture. Employees are expected to meet training standards:

(a) 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) Qualifications and Certification Standards PMS 310-1

(b) Non-Fire Related Aviation Position. All employees who work with or around aircraft tin non-fire related activities shall be qualified in accordance with the Interagency Aviation Training Guide. Personnel attempting to qualify for non-fire aviation positions may be credited for training that is equivalent to or exceeds the stated minimum requirements through the IAT system.

Aviation safety training follows a building-block approach. Employees will receive training commensurate with their position level within the organization and impact on the safety of the organization's operations. Personnel with aviation responsibilities must comply with policy and

program guidance (FSM 5723) to ensure their training is kept current. All aviation training is documented in each employee's training record.

Personnel should be assigned only to activities in which they have been purposefully and successfully trained. In addition to the training objectives established for employees and managers, training objectives will address:

(a) ASMS roles and responsibilities

(b) Agency doctrine, policy and objectives

(c) Safety risk management

(d) Safety assurance

Instructional System

The agency instructional system is an arrangement of resources and procedures to promote learning. Instructional design is the systematic process of developing instructional systems and instructional development is the process of implementing the system or plan.

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.

5.1.2 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/National sessions, and web-based training.

5.1.3 Continual Learning

Agency provided scholarships and other training opportunities provide an opportunity for experienced aviation personnel and managers to expand their skills and knowledge in aviation safety. The intent of agency supported continued education is to meet the requirements established in FMR 102-33 for Federal Aviation Safety Officers.

Curriculum may include instruction in the following areas:

(a) Accident Investigation
(b) Human Factors

(c) Leadership

(d) Aviation Safety Management Systems

- Safety Policy
- Safety Promotion
- Risk Management
- Safety Quality Assurance

5.1.4 Operational Training Systems

ASMS and risk management training components that are critical to the mishap prevention effort may include the following:

- Pilot Training
- Initial Mission certification
- Aircraft type transition, IFR refresher
- Regional Workshops
- Crew Resource Management Workshops
- (Pilot, crewmember, mechanic, aviation managers)
- National Aerial Firefighting Academy (NAFA)
- Fire Aviation Simulation Training

5.1.5 Professional Training for RASMs and FHP NASM

The following are the preferred training and experience levels for personnel who are newly appointed to a Regional and FHP Aviation Safety Manager position. This is also highly recommended for employees working in aviation maintenance, piloting, or aviation operations who wish to follow this process as an Individual Development Plan to further enhance their aviation career. The ASMS tasks within each level do not have to be performed sequentially. The purpose of the task list is to assist in mentoring the trainee toward achievement of the desired full performance level.

Level 1 ASMS: **New Aviation ASMS Personnel or Trainee IDP**

Successfully complete the following training requirements:

- Complete a 32-hour (min) ASMS course from an approved education institution or agency
- Complete IAT training courses to qualify as Aviation Manager
- Perform daily duties in accordance with FSM5700 in an aviation position or in a trainee detail for minimum 30 days
- Participate as a member of a FS Aviation Safety Assistance Team (ASAT) for a minimum of 5 working days

-AND-

- Perform daily duties and function as a QTI Trainee on a Region level aviation accident/incident
- QTI – SME assignment on an aircraft accident/Incident investigation

Level 2 ASMS: **Qualified Technical Investigator; FS Interagency Aviation Training (IAT) Trainer**

Successfully complete the following training requirements and meet the minimum qualification as a Qualified Technical Investigator (QTI).

- Attend the agency accident investigator (QTI) workshop
- Successfully complete a Washington Office approved aviation accident investigation course from the NTSB, FAA, or University
- Participate as an on-scene investigation team member under party status to an NTSB investigation

-AND-

- Perform daily duties in accordance with FSM5700 in an aviation position
- Complete an IAT –Trainer (A 220) course or equivalent
- Perform successfully as an IAT instructor

5.2 Aviation Safety Awards Program

The Forest Service sponsors a series of awards to recognize exemplary dedication to the safety of agency aviation operations. Actions that could be rewarded should reflect wide safety impacts, exceptional decision making, extra effort to enhance our safety culture and/or innovative thinking. Examples include:

(a) Identification of hazard(s) (An act or suggestion which prevents damage or injury) affecting the wider agency aviation operation

(b) Assisting in conducting an investigation or evaluation

(c) 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.

5.2.1 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. Airwards are given at the discretion of the National Aviation Safety Council. Airwards may also be given regionally at the discretion of the RASM.

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

(a) 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:

1. Award of Merit. 1,000 hours or five years of accident-free flight time
2. Award of Distinction. 2,000 hours or 10 years of accident free flight time
3. Award of Excellence. 3,000 hours or 15 years of accident free flight time
4. 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

1. All flight time submitted must have been accumulated on official government business
2. Dates for consideration need not be consecutive and
3. 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. Submit nominations for aviation safety awards to the RASM. The Regional Aviation Officer or a pilot's first-line supervisor may make the nomination and must include the following information:

1. Full name and assigned Region/Unit/Forest
2. Pilot's position and job series, GS-2181 or -2101
3. Verification of flight time and years of service as a Forest Service employee pilot

Exceptions.

1. 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.
2. Nominations which include an exception must be fully documented in an enclosure to the nomination. Decisions by the BC-ASMS or the RASM relative to the exception(s) are final.

5.2.2 Aviation Management Award

The Aviation Management Award recognizes individuals and groups at the District, Forest or Regional level for their contribution towards aviation safety awareness and objective accomplishment. Aviation Management Awards are presented at the discretion of the AD-A through coordination with subordinate Branch Chiefs for aviation and the BC-ASMS. Further guidance, including the nomination process, can be found in FSM 5710.6.

5.3 Safety Communication and Awareness

Effective communication makes the difference between an accident occurring or being prevented. Leadership/supervisors will develop positive communications with the field. 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, fulfills both assurance and promotion roles in accident prevention, lessons learned and safety communication. (Reference section 4.3.2 for further guidance) RASM's, RAO's, and the FHP NASM are the conduit and focal point for this communication to occur frequently and routinely.

Safety communication:

(a) Ensures staff members are aware of the ASMS

(b) Conveys safety-critical information

(c) Explains why particular actions are taken

(d) Explains why safety procedures are introduced or changed

5.3.1 Publications

In order to facilitate communication, the WO function of Doctrine, Communications, and Risk Management 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 typically 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. Individual regions may develop and distribute any of the safety documents listed above as needed.

6 - Forms

6.1 SAFECOM (AMD-34 / FS 5700-14)

https://www.safecom.gov/entry.asp

6.2 Mission Aviation Safety Plan (MASP)

(See 7.1 Appendix 1 for link to blank template)

7 - Appendices

7.1 Appendix 1 – Important Documents (links)

- Aviation Mishap Investigation Guide (AMIG)

https://usfs.app.box.com/folder/53925181077

- Mission Aviation Safety Plan

https://usfs.app.box.com/folder/49487043401

- SAFECOM

https://www.safecom.gov/

- National Aviation Safety Council (NASC) Charter

https://usfs.app.box.com/folder/81586391784

- Interagency Mishap Response Guide and Checklist

https://www.nwcg.gov/sites/default/files/publications/pms503.pdf

- Interagency Standards for Transportation of Hazardous Materials

https://www.nwcg.gov/sites/default/files/publications/pms513.pdf

- Interagency Standards for Fire and Fire Aviation Management

https://www.nifc.gov/PUBLICATIONS/redbook/2019/RedBookAll.pdf

- Interagency Aerial Supervision Guide

https://www.nwcg.gov/sites/default/files/publications/pms505.pdf

- NWCG Standards for Aerial Ignition

https://www.nwcg.gov/sites/default/files/publications/pms501.pdf

- NWCG Standards for Helicopter Operations

https://www.nwcg.gov/sites/default/files/publications/pms510.pdf

- NWCG Standards for Single Engine Airtanker Operations

https://www.nwcg.gov/sites/default/files/publications/pms506.pdf

- NWCG Standards for Airtanker Base Operations

https://www.nwcg.gov/sites/default/files/publications/pms508.pdf

- NWCG Standards for Airspace Coordination

https://www.nwcg.gov/sites/default/files/publications/pms520.pdf

- NWCG Technical Assistance Directory

https://www.nwcg.gov/publications/pms504

- FAA FOQA Guidance

https://www.faa.gov/regulations_policies/advisory_circulars/index.cfm/go/document.information/documentID/23227

7.2 Appendix 2 - Definitions

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

Accident - An unplanned event or series of events that results in death, injury, occupational illness, damage to or loss of equipment or property, or damage to the environment.

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.

Aircraft Incident - An occurrence, other than an accident, associated with the operation of an aircraft that affects, or could affect, the safety of operations.

Aircraft - A device that is used or intended to be used for flight in the air.

ALARP - As Low As Reasonably Practicable. The principle that residual risk shall be reduced as far as reasonably practicable to assess if risk is acceptable when evaluated against benefit.

Aviation Coordinated Response Protocol (ACRP) – The aviation portion of the overall Coordinated Response Protocol (CRP) concept. The Aviation CRP is designed to coordinate information with FS groups working together, including Learning Review Team, Peer Support/Critical Incident Stress Management, Law Enforcement and Investigations, Union, and Human Resources.

Air Safety Investigator (ASI) – A position under the BC-ASMS. A Federal employee with extensive education and experience in aviation mishap investigation; has knowledge of environmental, human, and material factors and analysis. Hired and tasked to investigate aviation mishaps and generate the Aviation Mishap Investigation Report (AMIR). Serves as a chief investigator (CI).

Analysis - The process of identifying a question or issue to be addressed, modeling the issue, investigating model results, interpreting the results, and possibly making a recommendation. Analysis typically involves using scientific or mathematical methods for evaluation.

Assessment – The process of measuring or judging the value or level of something.

Attributes – System Attributes, or the inherent characteristics of a system, are present in any well-defined organization and apply to an effective ASMS.

- Responsibility: Who is accountable for management and overall quality of the process (planning, organizing, directing, controlling) and its ultimate accomplishment.
- Authority: Who can direct, control, or change the process, as well as who can make key decisions such as risk acceptance. This attribute also includes the concept of empowerment.
- Procedures: A specified way to carry out an activity or a process – procedures translates the “what” in goals and objectives into “how” in practical activities (things people do). Procedures are simply documented activities to accomplish processes, e.g., a way to perform a process. The design expectations that are noted as procedures derive directly from the FSM 5709.16 and operational guides.

- Controls: Controls are elements of the system, including hardware, software, special procedures or procedural steps, and supervisory practices designed to keep processes on track to achieve their intended results. Organizational process controls are typically defined in terms of special procedures, supervisory and management practices, and processes.

- Process Measures: Ways to provide feedback to responsible parties that required actions are taking place, required outputs are being produced, and expected outcomes are being achieved. A basic principle of safety assurance is that fundamental processes be measured so that management decisions can be data-driven.

- Interfaces: This aspect includes examining such things as lines of authority between departments, lines of communication between employees, consistency of procedures, and clearly delineating lines of responsibility between organizations, work units, and employees. Interfaces are the "Inputs" and "Outputs" of a process.

- Interfaces in Safety Risk Management and Safety Assurance: Safety Risk Management (SRM) and Safety Assurance (SA) are the key processes of the ASMS. They are highly interactive, especially in the input-output relationships between the activities in the processes.

- Audit: Scheduled, formal reviews and verifications that evaluate whether an organization has complied with policy, standards, and/or contract requirements. An audit starts with the management and operations of the organization and then moves to the organization's activities and products/services.

- Internal audit: An audit conducted by, or on behalf of, the organization being audited.

- External audit: An audit conducted by an entity outside of the organization being audited.

Aviation System - The functional operation or production system used by an organization to produce an aviation product or service (see *System* and *Functional* below).

Aviation Safety Officer - A person who actively holds a position in a federal agency's aviation safety program applicable to the scope of operations and meets ICAP requirements for position, experience, education and training.

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

Compliance – This includes but is not limited to compliance with Federal regulations. It also includes agency contract requirements, requirements of operator developed risk controls or operator specified policies and procedures.

Conformity – Fulfilling or complying with a requirement [ref. ISO 9001-2000]; this includes but is not limited to complying with Federal regulations. It also includes complying with agency requirements, requirements of operator developed risk controls, or operator policies and procedures.

Continuous monitoring – Uninterrupted (constant) watchfulness (checks, audits, etc.), over a system.

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

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

Correct – Accurate, without ambiguity or error in its attributes.

Documentation – Information or meaningful data and its supporting medium (e.g., paper, electronic, etc.). In this context, *documentation* is different from *records* because *documentation* is the written description of policies, processes, procedures, objectives, requirements, authorities, responsibilities, or work instructions; whereas *Records* are the evidence of results achieved or activities performed.

Evaluation – An independent review of agency policies, procedures, and systems [ref. AC 120-59A]. If accomplished by the agency itself, the evaluation should be done by a person or organization in the agency other than the one performing the function being evaluated. An evaluation is an anticipatory process designed to identify and correct potential problems before they happen. An evaluation is synonymous with the term “systems audit.”

Fatal injury – Any injury that results in death within 30 days of the accident.

Functional – The term “function” refers to “what” is expected to be incorporated into each process (e.g., human tasks, software, hardware, procedures, etc.) rather than “how” the function is accomplished by the system. This makes for a more performance-based system and allows for a broad range of techniques to be used to accomplish the performance objectives.

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 (is a prerequisite to) an accident or incident.

Investigation – Gathering and interpreting information to help managers understand how and why an accident occurred.

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.

Likelihood – The estimated probability or frequency, in quantitative or qualitative terms, of an occurrence related to the hazard.

Line management – The management structure that operates (controls, supervises, etc.) the operational activities and processes of the aviation system.

Mishap – A broad term that includes accidents and incidents but does not include hazards.

National Aviation Safety Council (NASC) – Council Comprised of RASM's, FHP Aviation Officer, the Branch Chief, Aviation Safety Management System (BC-ASMS) National Aviation Risk Management Specialists and other non-voting members as outlined in the NASC charter.

Near Midair Collision (NMAC) – An incident associated with the operation of an aircraft in which the possibility of collision occurs as a result of proximity of less than 500 feet to another aircraft, or a report is received from a pilot or flight crewmember stating that a collision hazard existed between two or more aircraft. (ref. FAA Order 7210.56 paragraph 4-1-1).

Nonconformity – Non-fulfillment of a requirement. This could include but is not limited to, noncompliance with Federal regulations, agency requirements, requirements of operator-developed risk controls or operator-specified policies and procedures (Ref. ISO 9001-2000).

Objective – The desired state or performance target of a process. Usually it is the final state of a process and contains the results and outputs used to obtain the desired state or performance target.

Operational Control – The exercise of authority over initiating, conducting, or terminating a flight (14 CFR Part 1.1). This includes direct management oversight, supervision and accountability for a specific task, mission or assignment.

Operational life cycle – Period of time from implementation of a product/service until it is no longer in use.

Organization – Indicates both certificated and non-certificated aviation organizations, aviation service providers, air carriers, airlines, maintenance repair organizations, air taxi operators, corporate flight departments, repair stations, and pilot schools.

Outputs – The product or end result of an ASMS process, which is able to be recorded, monitored, measured, and analyzed. Outputs are the minimum expectation for the product of each process area and the input for the next process area in succession.

Oversight – A function that ensures that an aviation organization (internal and external) complies with and uses safety-related standards, requirements, regulations, and associated procedures. Safety oversight also ensures that the acceptable level of safety risk is not exceeded in the air operations system.

Pilot Currency – Meeting the legal requirements to act as a pilot in command of an aircraft within a certain time period as established and enforced by the FAA in the Federal Aviation Regulations (FARs). Not to be confused with proficiency, which means being prepared to handle any situation with which a pilot might reasonably be presented and varies from pilot to pilot. A proficient pilot is likely to meet currency requirements, but a current pilot is not necessarily proficient.

Pilot Proficiency –Fully competent in the art, science, skill, and subjects associated with piloting an aircraft. This typically means a pilot is prepared to handle any situation with which they might reasonably be presented. Not to be confused with Pilot Currency which is a requirement established through the FARs. A proficient pilot is likely to meet currency requirements, but a current pilot is not necessarily proficient.

Preventive action – Preemptive action to eliminate or mitigate the potential cause or reduce the future effects of an identified or anticipated nonconformity or other undesirable situation.

Procedure – A specified way to carry out an activity or a process.

Process – A set of interrelated or interacting activities that transform inputs into outputs.

Process Measures – See “Process Measures” under the *Attributes* definition, above.

Product/service – Anything that is offered or can be purchased that might satisfy a want or need in the air transportation system.

Qualified Technical Investigator – A Washington Office approved individual having experience in aviation program or safety management, fixed-wing or rotor craft operations, or aircraft maintenance who may assist with an aircraft mishap investigation or lead an incident investigation.

Quality Assurance – The process of verifying or determining whether products or services meet or exceed customer expectations. Quality management includes planning and checking standards while quality controls are specific standards that mitigate risk.

Quality Control - Part of quality assurance focused on the inspection aspect, including a review of the operational techniques, contractual obligations and activities used to meet requirements for a quality service or product.

Records – Evidence of results achieved or activities performed.

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.

Risk Control – Steps taken to eliminate (remove) hazards or to mitigate (lessen) their effects by reducing the severity and/or likelihood of risk associated with those hazards.

SAFECOM – The agency Form FS 5700-14, SAFECOM: Aviation Safety Communiqué. Used to report any condition, observation, act, maintenance problem or circumstance with personnel or aircraft that has the potential to cause an aviation-related mishap.
The form can be accessed at www.safecom.gov.

Safety Assurance – A formal management process within the ASMS that systematically provides confidence that an organization's products/services meet or exceed safety requirements.

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. Organized around the pillars of safety risk management, safety policy, safety assurance, and safety promotion.

Safety objective – 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 – 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. The SRM process is embedded in the processes used to provide the product/service; it is not a separate/distinct process.

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.

Substitute risk – A risk unintentionally created as a consequence of safety risk control(s).

System – An integrated set of constituent elements that are combined in an operational or support environment to accomplish a defined objective. These elements include people, hardware, software, firmware, information, procedures, facilities, services, and other support facets.

System Attributes – See *Attributes*, above.

System Safety – An overarching engineering discipline focused on designing and building fail-safe systems. Safety Management Systems branched from System Safety in order to include operational factors in aviation safety.

Unmanned Aircraft Systems (UAS) – An aircraft, used or intended to be used for flight in the air that has no onboard pilot, and its associated Ground Control Station. Includes all classes of airplanes, helicopters, airships and translational lift aircraft with control over 3 axes (FAA Interim Operational Approval Guidance 08-01-Unmanned Aircraft Systems Operation