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US FOREST SERVICE

Safety Management Systems Guide

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Introduction: .....

The Forest Service 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. We understand that safety is a dynamic non-event. Consequently, we need to maintain the capability to continuously seek out and eliminate latent defects within our systems and culture. By being proactive in this area we eliminate potential causal factors that could lead to future accidents. Safety policy as such directs the actions of personnel conducting Safety Management System (SMS) processes. SMS is a balance of using regulations, process and principles safely to achieve a safety culture of high reliability.

Purpose of This Guide .....

The purpose of this guide is to assist in fulfilling the requirements of FSM 5700 with respect to the implementation of Safety Management Systems (SMS). This guide provides best practices to the application of SMS in the Forest Service and its service providers. This guide replaces the document formerly titled FS Aviation Safety and Accident Prevention Plan.

Scope

1. This document provides guidance for SMS development applicable to all Forest Service aviation operations and all aviation service providers.

2. Statements containing the words must, shall, and will are directive in nature and the corresponding policy can be found in the FSM 5700. This Guide contains best practices for Safety Management Systems in the aviation program, thus the terms "may" and "should" indicate the best practice or an industry standard that allows some discretion in its execution. Every employee is accountable for conducting aviation operations in the safest manner practicable and with the lowest acceptable level of risk.

3. As of this writing, the development and implementation of an SMS within the commercial sector is voluntary. While the Forest Service encourages each aviation service provider to develop and implement an SMS, these systems in no way substitute for regulatory compliance of other FAA certificate requirements, where applicable.

Applicability

This agency views the objectives and expectations in this Guide to be a minimum level of development for an efficient and functional SMS.

1. This Guide describes the objectives and expectations for agency-wide Safety Management Systems (SMS) in the ground and air operations system.
2. This guide is intended to address aviation safety related operational and support processes and activities.
3. Aviation personnel, Operators and service providers are responsible for operating within SMS guidelines.

References

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

- FSM 5700 Aviation Management Manual
- FSH 5709.16 Aviation Administration Handbook
- FAA Advisory Circular 120 - 92
- ICAO System Management Manual Doc 9859
- FSM 6700 Safety and Health Program

Definitions, Terms and Acronyms

Note that definitions in this guide are specific to the SMS process and may not read exactly the same as definitions in sections of the FSM 5100, 5700 or 6100/Personnel Management. Definitions in this section are taken from the Federal Aviation Administration SMS Framework.

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. During a jump sequence, a Forest Service smokejumper is considered to have safely disembarked the aircraft after detaching from the static line from the parachute deployment system and when the parachute canopy has successfully deployed. (Refer to 14 CFR NTSB 830 for definition of reportable accidents)

- 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 Incident with Potential An "in-flight incident" that narrowly misses being an accident by NTSB definition and circumstances involve some aircraft damage, property damage, or minor injury to crew or passengers. Classification of Incidents with Potential is determined by the US Forest Service, Branch of Risk Management.

Air Safety Investigator (ASI) - A Federal employee who has education, expertise, and experience in aviation accident, mishap, or near miss investigation; has knowledge of environmental, human, and materiel factors and analysis in incidents; is tasked to investigate the incident and generate the safety investigation report (SIR). May also serve 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 – process of measuring or judging the value or level of something.

Attributes - System Attributes are present in any well defined organization and apply to an effective SMS.

- **Procedures -** The design expectations that are noted as procedures derive directly from the FSM 5709.16 and operational guides. Procedures are simply documented activities describing the standard way to perform a process in the context of the operational environment, organizational structure, and management objectives of the F.S.

- **Controls -** Organizational process controls are typically defined in terms of special procedures, supervisory and management practices and processes. Many controls are inherent features of the FS aviation operations. Such practices as aircraft and pilot carding inspections and management readiness reviews are Quality controls conducted within aviation the operations purview and compliment SMS design expectations.

- **Process Measures/Metrics -** A fundamental principle of safety assurance is that fundamental processes be measured so that management decisions can be data-driven. Outputs of each process should be quantified through continuous monitoring, internal audits or internal evaluation.

- **Interfaces** in Safety Risk Management (SRM) and Safety Assurance (SA) - SRM and SA are highly interactive and involve risk for error where interfaces involve different units, service providers, and ground and air operations, etc. Assessments of these relationships should pay special attention to flow of authority, responsibility and communication, as well as procedures and documentation.

Audit – scheduled, formal reviews and verifications to evaluate compliance with policy, standards, and/or contractual requirements. The starting point for an audit is the

management and operations of the organization, and it moves outward 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/production system used by the service provider to produce the product/service.

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

Continuous monitoring – uninterrupted watchfulness over the system.

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

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.

Corrective action – action to eliminate or mitigate the cause or reduce the effects of a detected nonconformity or other undesirable situation.

Correct – accurately reflects the item with an absence of ambiguity or error.

Documentation – information or meaningful data and its supporting medium (e.g., paper, electronic, etc.). In this context it is distinct from records because it is the written description of policies, processes, procedures, objectives, requirements, authorities, responsibilities, or work instructions.

Evaluation – a functionally independent review of policies, procedures, and systems. Program evaluation should be done by an objective organization outside the one being evaluated. An evaluation is an anticipatory process, and is designed to identify latent defects and correct potential failures before they occur. An evaluation is synonymous with the term systems audit.

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

Hazard – any existing or potential condition that can lead to injury, illness, or death to people; damage to or loss of a system, equipment, or property; or damage to the environment. A hazard is a condition that is a prerequisite to an accident or incident.

Incident – a near miss episode with minor consequences that could have resulted in greater loss. An unplanned event that could have resulted in an accident, or did result in minor damage, and indicates the existence of, though may not define, a hazard or hazardous condition.

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 within, as well as 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.

Mishap - A broad term that includes accidents, incidents with potential, and aircraft incidents but does not include hazards.

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

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.
Outputs – The product of an SMS process, which is capable of being recorded, monitored, measured, and analyzed.

Oversight – a function that ensures the effective implementation of safety-related standards, requirements, regulations, and associated procedures. Safety oversight also ensures that the acceptable level of safety risk is not exceeded.

Preventive action – action to eliminate or mitigate the cause or reduce the effects of a potential hazard or other undesirable situation.

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

Process – set of interrelated or interacting activities, which transforms inputs into outputs.

Product/service – anything that might satisfy a want or need, which is offered in, or can be purchased by a aviation contract.

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 be assigned participation as a member of an accident investigation team.

Records – evidence of results achieved or activities performed.

Residual safety risk – the remaining safety risk that exists after all control techniques have been implemented or exhausted.

Risk – The composite of predicted severity and likelihood of the potential effect of a hazard in its worst state.

Risk Control – refers to steps taken to eliminate hazards of to mitigate their effects by reducing severity and/or likelihood of risk associated with those hazards.

SAFECOM - The agency Form FS 5700-14, SAFECOM: Aviation Safety Communiqué, used to report aviation mishaps or hazards; this form also is approved for interagency use as Form AMD-34.

Safety Assurance – SMS process management functions that systematically provide confidence that organizational 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 (as described in this document it includes safety risk management, safety policy, safety assurance, and safety promotion).

Safety planning – part of safety management focused on setting safety objectives and specifying necessary operational processes and related resources to fulfill the quality objectives.

Safety risk – the composite of predicted severity and likelihood of the potential effect of a hazard.

Safety risk control – anything that reduces or mitigates the safety risk of a hazard. Safety risk controls must be written in requirements language, measurable, and monitored to ensure effectiveness.

Safety Risk Management (SRM) – a formal process within the SMS composed of describing the system, identifying the hazards, assessing the risk, analyzing the risk, and controlling 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 SMS in an organization

Service Provider - A person or company that is financially procured by the Government to provide goods or services

Severity – the consequence or impact of a hazard in terms of degree of loss or harm.

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 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.

SMS Guide Structure

The SMS Guide is broken down into four components based on the information found in the International Civil Aviation Organization (ICAO) System Safety Manual and FAA SMS Guide. The Policy component reflects Forest Service specific policies and best practices. Safety Risk Management, Safety Assurance and Safety Promotion components are further broken down into processes that are unique to the Forest Service Aviation organization and mission. This guide lays out characteristics that are expected of a robust

SMS. They are called "functional" expectations because they describe the "how" of each process. Regions/Stations/Areas are expected to develop processes to meet these expectations.

I. Safety Policy Component

The Forest Service Safety Policy Statement from The Chief, 2008: "Our number one job at the Forest Service is to protect our most valuable resource—our employees. Unless we do that, we cannot be a world-class leader in natural resource management. In addition, I share a deep commitment with the National Leadership Team to protect every Forest Service partner and the public we serve. Therefore, I expect every line officer, manager, supervisor, and employee to manage risk exposure. That means identifying and abating hazards, refusing to accept unnecessary risk, and making risk-related decisions at the appropriate level."

Management has defined the policy and doctrine in FSM 5700 that conveys aviation safety expectations and objectives to employees. Management expectation is that aviation personnel must adhere to the stated policy and best practices. US Forest Service aviation safety policy is stated in FSM 5720 and addresses roles, responsibilities, and authorities regarding aviation safety at each organizational level. This guide provides detail for safety personnel responsibilities and processes.

Significant attention to safety in the aviation industry has evolved over many years of applying good practices. Continuous improvement in aviation safety, with balance achieved between safety and efficiency, demands that all participants in the system challenge the processes, the culture, and themselves, to identify weaknesses and to seek corrective solutions.

Description: Safety Management Systems (SMS). The definition of SMS is a Systemic approach to managing safety, including the necessary organizational structures, accountabilities, policies and procedures. The result is the ability to systemically identify hazards and control risks as well as provide assurance that risk controls are effective. Although we currently do a good job of identifying hazards and controlling risks, we are seeking out the full benefit that a system wide approach provides. The objective of SMS is to provide a structured management system to control risk in operations. A formal system of hazard identification and safety risk management is essential in controlling risk to acceptable levels. Safety management is centered on a systematic approach to hazard identification and risk management, in the interests of minimizing the loss of human life, property damage, and financial, environmental and societal losses.

The foundation of SMS consists of four components; they are Safety Policy, Safety Risk Management, Safety Assurance and Safety Promotion. When fully implemented SMS provides and promotes a Positive Safety Culture.

SMS Organization and Key Safety Personnel

Washington Office, Branch Chief Aviation Risk Management and Training Systems (BC,ARMTS)

This position is located at the National Interagency Fire Center (WO WEST). The BC, ARMTS has collateral duties for oversight of aviation safety and Aviation Training Systems and as such, possess specialized knowledge, skills and abilities.

1. The BC, ARMTS must possess a FAA Commercial Pilot license with an Instrument rating; - OR - possess an FAA Airframe and Powerplant Certificate with and Inspector Authorization and Private Pilot Certificate.

2. Must possess a FAA Flight Instructor Rating, or a Forest Service or Department of Interior certificate as an Interagency Aviation Training (IAT) Instructor.

3. Must be qualified to Interagency Committee for Aviation Policy (ICAP) Federal Aviation Safety Officer Standards in compliance with Title 41 FMR (Federal Management Regulations) 101-37.

4. Must meet the Forest Service requirements as a Qualified Accident Investigator (QTI) or Federal Air Safety Investigator (ASI).

This position is located at the National Interagency Fire Center (NIFC), has the operational responsibility for development, implementation, and monitoring of the Aviation Safety Management Systems, including oversight of the following key SMS components:

1. Policy, including managing and coordinating implementation of the National Aviation Safety Management Guide.

2. Risk management.

3. Safety Assurance.

4. Safety Promotion, including training programs.

5. Reporting accidents and incidents to the Director, Fire and Aviation Management Staff, Washington Office and to Forest Service and Department Safety and Health officials. Determining the classification of mishaps as accidents, incidents with potential or incidents.

6. Management and oversight of Aviation Safety Systems including;

National Aviation Safety Center, System Safety Enterprise Team, National Aviation Safety Council, SAFECOM reporting system; aviation safety training and education.

7. Maintaining master copies of all aviation guides and handbooks in the National Aviation Safety Center, including posting a list of guides and handbooks received from all committees/steering groups with their most recent edit date on the Internet. The master library should provide an effective resource/publication tracking system, for monitoring mishap prevention procedures and for sharing lessons learned with the aviation community. Maintains a process for data collection and analysis; and evaluation of aviation risk management and operational safety.

8. Establishes safety criteria and standards for National aviation contracts.

9. Coordinates with the National Aviation Officer, Logistics to assure aircraft airworthiness standards and aircraft selection in Agency and service provider aircraft types and provides guidance for final fleet composition.

10. Provides program oversight and direction for aviation education and training, including interagency aviation training (IAT), System Safety Leadership for Agency Managers (SSLAM) and Lessons Learned.

Forest Health Protection National Aviation Safety Manager

Designated by the Director of Forest Health Protection, State and Private Forestry, Washington Office, the Forest Health Protection National Aviation Safety Manager (FHP NASM) is responsible for coordinating safety matters for Agency and cooperators conducting FHP aviation activities such as aerial reconnaissance, aerial application and aerial photography. The position provides a national focal point for forest health aviation, a conduit between National leadership and Regional FHP aviation, works closely with National and Regional Fire and Aviation staffs and also with various state and other federal partners. Duties include application of the principles of SMS in order to provide risk management oversight, monitor aviation trends, coordinate and provide training as a qualified Interagency Aviation Training (IAT) Instructor, ensure compliance with aviation policies and procedures, participate in safety evaluations, coordinate with safety managers and unit aviation officers for the purpose of accident prevention. The FHP NASM is the permanent chair of the Aerial Survey Working Group, a member of the Aerial Applications Safety Council, the National Aviation Safety Council, the IAT Steering Committee, and participates within a variety of other forest health and aviation-related councils and committees.

National Aviation Safety Council

The National Aviation Safety Council is an organized group chartered in accordance with FSM 5700. The Council is the steering group for SMS. The Aviation Safety Council at the National level must be maintained as part of the aviation accident prevention effort.

1. The Aviation Safety Council is organized and chaired by the Forest Service's BC, ARMTS and consists of the following personnel as a minimum:

a. BC, ARMTS (Chair).

b. Regional Aviation System Safety Managers.

c. National Forest Health Protection Aviation Safety Manager.

d. National Fire Operations Safety Manager (adjunct).

2. The Aviation Safety Council must meet semi-annually and conduct monthly conference calls.

3. The Aviation Safety Council minutes must document specific action items, persons responsible for implementation, and due dates.

4. The general duties of the Aviation Safety Council are to:

a. Promote the SMS Guide through the exchange of ideas, discussions, and reports of flight hazards or deficiencies.

b. Encourage the application of best practices to the Forest Service at all levels of the organization.

c. Update this Guide annually at a minimum.

d. Track the accomplishments of action items from all aviation Accident Review Boards and Incident With Potential Review Boards.

e. Review SAFECOM trends, Safety Alerts and Technical Alerts.

f. Provide recommendations to improve aviation safety plans, policies, and procedures designed to enhance aviation safety.

Regional Aviation Officers

Regional Aviation Officers are responsible for fostering and promoting a positive safety culture through incorporating the elements of a SMS into Regional aviation operations, including:

1. Coordinating with the Regional Aviation Safety Manager on aviation safety and accident prevention matters.

2. Reviewing Project Aviation Safety Plans (PASP) and Forest/Unit Aviation Plans.

3. Ensuring compliance with aviation safety policies and procedures.

4. Overseeing and participating in safety assurance of aviation operations.

5. Encouraging the promotion of SMS through training and awareness.

6. Ensuring aviation safety through the aggressive application of operational risk management.

Regional Aviation System Safety Managers

Regional Aviation Safety Managers (RASSM) foster a safety culture through the development of flexible, reporting, learning, just cultures to result in the establishment and maintenance of a high reliability organization. The RASSM position is on the forefront of establishing and implementing SMS.

Regions will ensure that qualified RASSMs remain a key position and will ensure that recruiting and hiring such individuals is a high priority. The safety manager shall be separate from the aviation officer so that safety duties are separate from operational duties. Safety oversight must be performed independently of aviation operations to avoid conflicts of interest. The RASSM may have collateral duties but aviation safety must be their primary duty.
A set of Knowledge, Skills, and Abilities and Special Experience Standards is maintained in order to assure that high quality personnel are recruited in these specialized positions.

1. RASSMs are responsible for implementation, fostering and promoting SMS, including:

Policy

- Guiding aviation safety doctrine, philosophy, principles and practices
- Preparing the Regional Aviation Safety Plan and reviewing Forest/Unit supplements to that plan, including Project Aviation Safety Plans (PASPs).
- Assist in the development of local standard operating procedures
- Foster and promote doctrinal principles and safety management systems within the Region

Risk Management

- Provide the field with operational risk management guidance.
- Conduct risk management of the regional aviation program (fleet, service provider, and cooperators, etc) by identifying hazards, ensuring development and implementation of risk mitigation procedures and re-evaluating

- Support the National aviation program by
    - Participation on the Aviation Safety council
    - Participate in Risk Assessments and Mitigation

Assurance

- The RASSM will provide aviation safety oversight and review through active field presence and encourage a reporting culture between management and aviation.
- Monitor established standards and procedures and make corrections as needed.
- Monitor accident and incident trends, and implement appropriate prevention action.
- Report accidents and incidents with potential in accordance with the Accident/Incident Response Guide.
- Conduct accident and incident investigations as requested.
- Provide guidance, coordination, and monitoring of safety evaluations conducted by the Regional aviation staff and Forest/Unit Aviation Officers.
- Provide assistance in aviation activities to ensure best practices and procedures are understood.
- Promote and provide corrective action on SAFECOM reports, develop trend analysis and communicate lessons learned.
- Review aviation accidents and incident and follow-up on action items.

Promotion

- Coordinating and monitoring aviation safety training to promote a learning culture.
- Provide timely aviation safety information to all levels of the organization.
- Train and encourage employees to use accident prevention tools such as SAFECOMs, risk assessments, lessons learned, safety alerts, etc.
- Communicate and coordinate with cooperators, interagency partners, and subject matter experts (SMEs) such as the Aviation Enterprise Team.

- Recognize positive safety behavior and proactive reporting through an Aviation Award program

2. Regional Aviation Safety Managers must be qualified to Interagency Committee for Aviation Policy (ICAP) Federal Aviation Safety Officer Standards in compliance with Title 41 FMR (Federal Management Regulations) 102-33 and hold a private pilot certificate issued by the Federal Aviation Administration. To maintain active status as a federal ASO Certificate holder, an ASO must be actively engaged in a federal agency's aviation safety program and must complete an additional 16 hours of ASO course elements within 24 calendar-months from the date an ASO first completes the initial requirements for the certificate and each subsequent 24 calendar month period.

Training for the ASO must include at least the following course elements:
Basic Aviation Accident Investigation
Human Factors
Risk Management
Aviation Safety Program Management
Legal Aspects of Aviation

3. Prerequisites to hiring a GS-13 Regional Aviation Safety Manager must include the following Knowledge, Skills and Abilities (KSA) and Specialized experience:

KSA: Ability to collaborate with others to carry out transportation programs and projects.
Worked with staff of partner, stakeholder and customer organizations to plan, implement and evaluate transportation studies and projects.

KSA: Ability to prepare written studies, reports, and regulations.
Researched technical and regulatory data, and prepared organization policies, guidelines and procedures on various aspects of an agency's transportation program.

KSA: Knowledge of U.S. laws, regulations and policies applicable to the organization's transportation mission and programs.
Used knowledge of U.S. law, regulations and procedures to carry out a variety of transportation analysis, resource management, conservation, monitoring or compliance programs.

KSA: Knowledge of operational capabilities and limitations of aircraft.
Interpreted and applied the operational capabilities and limitations of aircraft to safely operate fixed and rotary wing aircraft according to the nature and purpose of the flight assignment.

KSA: Ability to plan and manage aviation programs.
Participated in the planning, development, implementation, and evaluation of program management procedures and policies.

KSA: Ability to communicate effectively other than in writing.
Communicated with people from a variety of backgrounds and cultures and maintained working relationships with others in order to carry out agency mission.

SPECIALIZED EXPERIENCE STATEMENTS

- Served as an expert technical consultant in aviation operations and provided interpretation of complex data, policy, procedures and requirements as they pertain to aviation.

- Performed field inspections and conducted in-depth aviation investigations which included a broad spectrum of complex problems, assembled available information and data, and prepared recommendations related to planned enforcement actions.

- Provided expert technical advice and assistance on program matters in aviation operations to individuals and organizations both inside and outside the immediate organization and the agency; provided expert interpretations of complex data, legislation and regulations.

- Performed field inspections and conducted in-depth investigations which included a broad spectrum of complex problems, assembled available information and data, and prepared recommendations related to planned enforcement actions. Field inspections included aircraft operations, bases, and personnel to determine compliance with policy and direction as well as mission readiness. Investigations involved aviation accidents, incidents, or identified hazards. Enforcement actions were those actions taken to enforce law, regulation, or agency policy.

All Employees

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

1. Every employee has a responsibility to identify hazards, assess risk and mitigate risk to the lowest acceptable level.

2. 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.

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

4. Use the SAFECOM system to report any condition, observance, act, maintenance deficiency, or circumstance which represents a significant hazard. (refer to SAFECOM chapter in this Guide)

5. Participate in accident prevention by reading available safety information.

6. Aviation personnel must be qualified for the positions and functions they are assigned to perform in.

II. Safety Risk Management (SRM) Component

The objective of a Safety Management System is to provide a structured management system to control risk in operations. Effective safety management must be based on characteristics of our processes that affect safety. Safety is defined in dictionaries in terms of absence of potential harm, an obviously impractical goal. However, risk, being described in terms of severity of consequences (how much harm) and likelihood (how likely we are of suffering harm) is a more tangible object of management. We can identify and analyze the factors that make us more or less likely to be involved in accidents of incidents as well as the relative severity of the outcomes. From here, we can use this knowledge to set system requirements and take steps to insure that they are met. Effective safety management is, therefore, risk management (SRM). The Agency develops processes to understand the critical characteristics of its systems and operational environment and applies this knowledge to the identification of hazards, risk decision-making, and the design of risk controls. Be aware that disciplines in the financial industry use the term risk management in the context of assessing risk for financial loss and this should not be confused to be the same intent as with SRM.

Management of Change

The WO Branch of 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.

1) The Agency will define a process for risk acceptance that defines acceptable and unacceptable levels of safety risk; establishes descriptions for severity levels, and likelihood levels.

2) The Agency will define specific levels of management that can make safety risk acceptance decisions.

3) The Agency will define acceptable risk for hazards that will exist in the short-term while safety risk control/mitigation plans are developed and executed.

4) The Agency will establish feedback loops between assurance functions to evaluate the effectiveness of safety risk controls.

The following must not be implemented until the safety risk is determined to be acceptable through a thorough analysis of the systems involved or affected:

a) New system designs;

b) Changes to existing system designs;

c) New operations/procedures; and

d) Modified operations/procedures.

The SRM process will ensure aviation personnel take interim immediate action to mitigate existing safety risk.

Levels in Risk Management.

Risk management process 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 continues throughout the mission and should be applied throughout the entire operation from planning through execution to the evaluation phase. The risk management process works in a continuous loop of events that include all of the systems making up an aviation operation. Refer to the Appendix of this Guide for review of more specific procedures recommended for use in each level of Risk Management.

Risk management can be divided into three levels.

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

2. **Deliberate.** This **ORM** 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 ORM are project aviation safety plans (PASP) and job hazard analysis (JHA).

3. **Strategic/In-Depth.** Strategic Risk Management is conducted at the highest levels of the organization and is typically applied to "systems of systems" type complexity, and requires more sophisticated techniques and professional reviews. This method should be used in instances where new technology or a change in process is being proposed, when risks appear consistently high, and time and resources dictate a thorough assessment. It involves an additional phase in the objective of the risk assessment which includes a cost/benefit analysis of mitigations. The strategic process produces a more permanent record of findings and decisions used for long term planning, organizational decision-making and as authoritative training resources.

   There is a necessary Seventh Step in the Risk Management Process when conducting a Strategic analysis. This change begins in the first step of identifying the objective of the analysis. The process described by the FAA AC120-92

involves seven steps in the complete cycle of risk management;

1. Define Objectives (i.e. Strategic program analysis, change management, accident action plan, other)

2. System Descriptions: Identify each system - component that contributes to the mission.

3. Hazard Identification: Brainstorm all possible failures, threats, and danger points.

4. Risk Analysis: Disassemble the hazard to identify outcomes, impacts of a hazardous event, and degree of **exposure** to risk.

5. Risk Assessment: Evaluate **potential** for injury, damage, fatality, etc. based upon severity and likelihood of an event occurring.

6. Decision Making: Determine mitigations needed, conduct risk/benefit analysis, develop an action plan, and implement controls.

7. Validation of Control: Monitor controls and supervise operations to determine if controls are effective.

REFERENCE APPENDIX "A" FOR SPECIFIC RISK ASSESSMENT PROCEDURES IN EACH OF THE THREE LEVELS OF RISK MANAGEMENT.

Organizational Decision Making

The basic concept of decision-making is to assure that 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. During this step organizational controls will be evaluated and implemented that are intended to reduce and mitigate the risk to a level that is appropriate to the derived benefit.

These basic decision-making principles must be applied before any anticipated job, tasks, or mission is performed:

- **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.

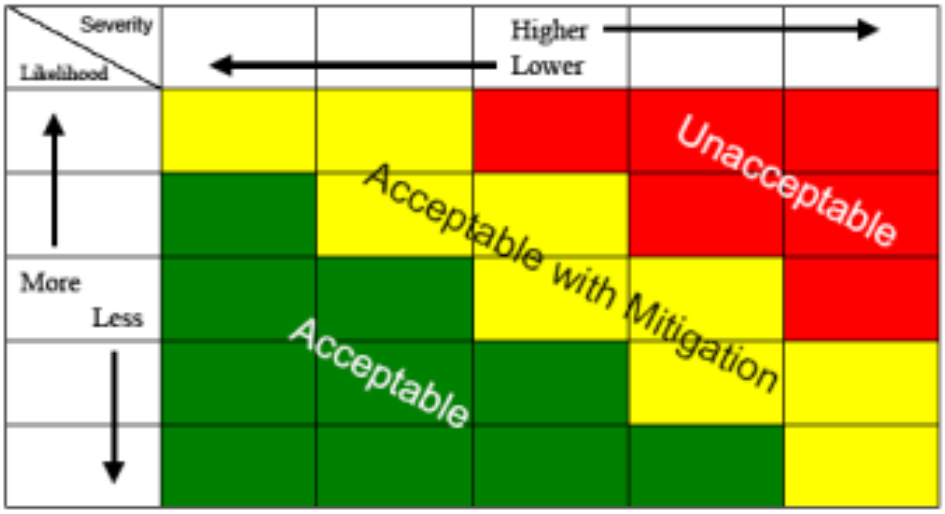
- **Make risk decisions at the appropriate level**. Making risk decisions at the appropriate level establishes clear accountability. Those accountable for the success or failure of a mission must be included in the risk decision process. Supervisors at all levels must ensure subordinates know how

much risk they can accept and when they must elevate the decision to a higher level.

- **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.

Risk Acceptance 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.

- **Low-** risk accepted by the aviation manager conducting the assessment. (e.g. HMGB/FWFM)
- **Medium-** risk accepted by the next level project manager (e.g. AOBD, DFMO, FAO)
- **Serious** - risk accepted by the next level supervisor (e.g. Regional fire director, IC, line officer)
- **High-** risk accepted by line officer and above
- **Extreme –** risk not accepted



III. Safety Assurance Component

The safety assurance component involves processes for quality control, mishap investigation and program reviews.

The safety management process described in this Guide addresses design and implementation of organizational processes and procedures to control risk in aviation operations. Once these controls are in place, quality management techniques can be used to provide a structured process for achieving objectives. Safety management must be thought of as quality management of safety related operational and support processes to achieve safety goals.

The very nature of our work is within an elevated risk environment and repeated exposure without incident creates complacency, resulting in taking risks that may be unnecessary. Like repeatedly running a yellow traffic light, we become comfortable with deviations and lose our respect for risk; this is called "normalization of deviance". Even more disconcerting, we sometimes fail to recognize that we are engaging in risky behavior (like the accomplished pilot that always flies lower than others and is never corrected). We fail to recognize that statistically these deviations will eventually manifest themselves in an accident scenario. Pro-active management recognizes the need for controls to manage hazardous behaviors and pull employees back into best practices.

We need to assure that controls and mitigations are continuously validated. This means we need to foster and promote a safety culture encompassing all employees which validates best safety practices, takes a more conservative approach to mission accomplishment, communicates hazards and successes, seeks to learn, measures results, and is flexible to accommodate necessary changes.

Continuous Monitoring and Validating

Aviation managers monitor aviation operations and facilities to measure the effectiveness of safety controls and their performance.

These responsibilities include:

a) Determine compliance with safety controls

b) Measure the effectiveness of safety controls

c) Assess system performance

d) Identify hazards

e) Validate risk management processes.

Ref: FSH 7709.58 - Transportation System Maintenance Handbook (airport maintenance)

Standards for evaluation

The Agency will perform an assessment of the performance and effectiveness of risk controls, conformance to SMS expectations and the objectives of the safety policy.

The following parameters will apply to both internal and external audits and evaluations:

Local levels should review their aviation programs annually.

Regions should review their aviation plans annually, and Forest programs at least bi-annually.

National external evaluations should occur every five years.

Criteria will follow the ICAP standard for Aviation Resource Management Survey (ARMS) to include:

1) Management is responsible for ensuring that regular audits are conducted to:

a) Determine compliance with safety controls.

b) Assess performance of safety controls.

c) Evaluate safety-related functions of operational processes against their objectives and expectations.

d) Measure SMS metrics against objectives and expectations.

2) Planning of the audits program will take into account:

a) Safety criticality of the processes to be audited (post-accident)

b) The results of previous audits, outstanding action items or new safety concerns.

3) System assessments will document results that indicate a finding of:

a) Compliance with existing safety risk control(s)/ SMS expectations(s) (including regulatory requirements)

b) Noncompliance with existing safety risk control(s)/ SMS expectations(s) (including regulatory requirements)

4) When the evaluation discovers new hazards or the need for system changes, the SRM process will be utilized.

5) Methods will be customized for each situation.

Internal Audits/Evaluations

Units who use aviation resources should perform regularly scheduled internal audits of operational processes, to determine the performance and effectiveness of risk controls.

A) Region/Station/Area program reviews (including Office of Safety and Occupational Health (OSOH) audits)

B) Fire Readiness Reviews

C) Aviation base reviews

Operational units should ensure that regular internal evaluation/review of safety-related functions of the organization's operational processes (production system) are conducted.

1. Aviation Management Reviews. Conduct Aviation Management Reviews (AMR) in accordance with FSM 1410, normally 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.

2. Site Visits. Conduct site visits normally as functional assistance trips (FSM 1415). 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. The National Aviation Operations Officer for Operations selects site visit teams, designates team leaders, and provides teams with written guidelines for each visit which include, but are not limited to, review of: staffing and organization, conduct of internal Regional reviews, administrative use of aircraft, and Working Capital Fund rate setting.

3. Quality Assurance Program Evaluation. Conduct Program Evaluations (QAPR) during the planning process for all new aviation operations and periodically thereafter to address changes in process or policy. This is generally accomplished in conjunction with a Strategic Risk Assessment and is coordinated by the Branch Chief, Aviation Risk Management and Training. Program reviews meet the requirement for SMS Quality Assurance and must be documented by a GAP Analysis checklist. (ref. FSM 5709.10.1).

External Audits/Evaluations

The Agency will include the results of assessments performed by oversight organizations in its analysis of performance and safety program health.

Examples of continuous external auditing include the following agency processes:

A) External contracting sources

B) Office of Management & Budget (OMB)

C) Office of the Inspector General (OIG)

D) Government Accounting Office (GAO)

Investigation

Accident investigation is an assurance process and fully referenced in the FSM 5720. Processes for investigation are administered by the Office of Safety and Occupational Health (OSOH) and are described within the Accident Investigation Guide (FSH 6709.11).

The information disclosed by accident investigation reports, accident review boards and other mishap investigation processes is utilized for the purpose of improving and validating SMS processes. Mishap data is one method for measuring the success rate of risk controls, one example of an industry metric is the aircraft accident rate which is determined by accidents per 100,000 flight hours.

Immediately after the occurrence of a possible aviation incident with potential or NTSB-defined accident, mishap, or near miss, the aircraft operator shall provide all the information listed in exhibit 02 FSH 6709.11 (Appendix D) to the Chief, Aviation Risk Management (CARM) and the OSOH.

The NTSB has the authority to investigate all aircraft mishaps. In the event that the NTSB exercises their authority to investigate a Forest Service aircraft mishap, the Forest Service reserves the right to conduct a separate investigation in accordance with FSH 6709.11 through formal agreement, notification, and request to the NTSB. The Forest Service may also be a party to the NTSB investigation. When the agency has party status to an NTSB investigation, all authority and control of the investigation is maintained by the NTSB investigator in charge (IIC). All documentation of evidence and release of information is under the control of the IIC.

The Delegating Authority (identified in FSH 6709.11, 71.4 exhibit 1) will determine the investigation needs associated with and relevant to the reported mishap. In the event of incidents, incidents with potential, and minor accidents, the line officer of the unit experiencing the mishap may make the determination for investigation. 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 and CARM. In many incidents, the CARM may determine a need for an investigation for the purpose of developing lessons learned and identification of systemic defects that could result in greater damage if not corrected.

All investigations will be conducted under technical support from a Air Safety Investigator (ASI) or Qualified Technical Investigator (QTI). A team leader, document specialist, and technical specialists may be assigned dependent on the complexity and severity of the mishap.

An enterprise team (Safety System Enterprises) has been established to support the investigation needs of the agency by creating a group of highly experienced investigators with diverse aviation background whose primary purpose is to provide immediate

response to mishaps for investigation purposes. All members are Air Safety Investigators, experienced with working alongside NTSB and FAA and developing reports for aviation accident review boards and in development of lessons learned.

Within 10 working days of an aircraft mishap or near miss that meets the reporting requirements as defined in exhibit 02, the CARM shall submit an NTSB form 6120.1/2 to the NTSB regional office nearest to the location of the accident, mishap, or near miss. This responsibility is normally delegated to the mishap investigation Team Leader or QTI.

The mishap investigation team will produce a 24 hour report within the first day of arriving at the scene. A 72 hour report with any significant time-critical findings will be submitted by the end of the third day, and final factual and management evaluation is due within 45 days of the mishap. All reports are submitted to the Delegating Authority. An aviation accident board of review will evaluate the findings and recommendations of the investigation team and submit their approval or rejection within 90 days of the accident. All reports developed while in a party status will be forwarded to the NTSB IIC and have that person's permission prior to submittal.

Emergency Preparedness and Response

The Interagency Aviation Mishap Response Guide and Checklist template will be maintained by the WO Branch of Risk Management in cooperation with the Department of Interior agencies.

The Serious Accident Investigation Guide (AIG) is published by the WO Office of Occupational Health and Safety, in accordance with FSM 6700. The AIG will be housed in the Branch of Risk Management library and followed in the event of an accident or incident investigation.

Regions/Stations/Areas conducting field aviation operations have a responsibility to initiate emergency response and cooperate with search and rescue efforts for all agency and cooperator missing, overdue and downed aircraft.

IV. Safety Promotion Component

The organization must promote safety as a core value with practices that support a positive safety culture. Safety promotion can be accomplished through safety awards, education and communication.

Leadership will promote the growth of a positive safety culture and communicate it through out the organization. One process we will use to communicate aviation lessons learned will be to coordinate with the Wildland Fire Lessons Learned Center (WFLLC). WFLLC actively promotes a learning culture to enhance and sustain safe and effective

work practices in the wildland fire community. The Center provides opportunities and resources to foster collaboration among all fire professionals, facilitates their networks, provides access to state-of-the-art learning tools, and links learning to training.

How adequately people can convert the lessons that they have learned into reconfigurations of assumptions, frameworks, and action (learning culture) facilitates the development and health of the safety culture. Leadership will promote the growth of a positive safety culture through:

a) Publication of senior management's stated commitment to safety to all employees

b) Visible demonstration of their commitment to the SMS

c) Communication of the safety responsibilities for the organization's personnel

d) Clear and regular communication of safety information to all employees and service providers

e) An effective employee reporting and feedback system that provides confidentiality as necessary

f) Use of a safety information system that provides an accessible efficient means to retrieve information

Training and Education Systems

A Forest Service-wide goal is to accomplish safe, efficient, and effective utilization of aviation resources. Increasing employee awareness of agency policy, procedures, and safe practices must receive high priority. Aviation education and training, whether basic safety, specialized, or management, is a method to increase this awareness and a key to meeting this goal. A highly trained, educated, and experienced workforce is critical to the future of aviation management in order to meet the challenges of the aviation environment. Employees will receive training commensurate with their position level within the organization and impact on the safety of the organization's products or services to ensure training currency, it will be periodically reviewed and updated.

Instructional Design as a Process:

Instructional Design is the systematic development of instructional specifications using learning and instructional theory to ensure the quality of instruction. It is the entire process of analysis of learning needs and goals and the development of a delivery system to meet those needs. It includes development of instructional materials and activities; and tryout and evaluation of all instruction and learner activities.

Instructional System:

An 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 & developed as appropriate.

Interagency Aviation Training (IAT) refer to https://www.iat.gov and the IAT Guide for information on Agency specific requirements.
An interagency-wide goal is to accomplish safe, efficient, and effective utilization of aviation resources. Increasing employee awareness of policy, procedures, and safe practices must receive high priority. Aviation training, whether safety, specialized, or management, is a method to increase this awareness and a key to meeting this goal. IAT is conducted through Local/Regional sessions, ACE sessions and web based training. The IAT system was developed to provide aviation training standards for resource agency personnel (not including pilots) to provide "A - level" courses that:

1. Establish minimum training, skills, knowledge, and currency requirements for agency personnel who work with aircraft or have aviation duties in order to accomplish resource (non-fire) missions.

2. Provide a forum for interagency coordination in the development and implementation of aviation education, training, and qualification standards.

3. Maintain a high level of currency in education and training methods and techniques, as well as audio-visual technology, within the budgetary constraints of each individual bureau/agency.

4. Establish an interagency aviation qualification, certification, and documentation system.

5. Establish qualifications and currency standards for interagency aviation trainers (IATs).

6. Utilize a systematic process to ensure application of instructional technology to course planning and development.

The following positions require a level of specific skills and knowledge to perform aviation duties and ensure optimum performance levels with safety in mind:

1. Aircrew Member
2. Aviation Dispatcher
3. Aviation Manager
4. Aviation Technical Specialist
5. Contracting Officer's Representative (COR)/P
6. Fixed-Wing Flight Manager
7. Fixed-Wing Flight Manager - Special Use Manager
8. Helicopter Flight Manager
9. Helicopter Manager - Resource

10. Passenger
11. Project Aviation Manager

Personnel should be assigned only to positions in which they have been successfully trained.

System Safety Leadership for Agency Managers (SSLAM) refer to http://extension.ucdavis.edu/unit/aviation_safety_management for information on the certificate program for Emergency Response Aviation Safety Program Management.

SSLAM offers an opportunity for experienced personnel to learn and understand the professional aspects of aviation management in the Wildland Fire Management environment. The curricula includes:

- Aircraft Health Management
- Incident Command System: Aviation Operations
- Aviation Leadership
- Aviation Safety Management Systems
- Human Factors and Operational Risk Management
- Aviation Communications

Operational training systems include SMS and risk management components that are critical to the mishap prevention effort.

Pilot Training:
- Initial Mission certification
- Aircraft type transition, refresher
- Regional Workshops and refreshers
- Mountain Flying Clinic

Crew Resource Management Workshops
- pilot
- crewmember
- mechanic

Military Aerial Fire Fighting Systems (MAFFS)

Single Engine Airtanker (SEAT) Academy (BLM sponsor)

Cooperator Aviation Training courses (CAL FIRE ATGS Trng)

National Aerial Firefighting Academy (NAFA)

National Wildland Coordinating Group (NWCG) S-courses and task books to achieve IQCS qualifications.

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.

RASSM's are the voice of the SMS program. It is vital to accident prevention that SMS best practices are shared with field personnel and contractors. RASSM's are the conduit and focal point for this communication to occur frequently and routinely..

Publications. In order to facilitate communication, the WO Branch of Risk Management publishes the following:

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

(2) **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.

(3) **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.

(4) **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.

(5) **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.

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

Reporting and Feedback System. (SAFECOM)

The Agency will maintain the SAFECOM system as a confidential safety reporting and feedback system for employees and service providers contracted to the USFS. Data obtained from this system will be monitored to identify emerging hazards and to assess performance of risk controls in the operational systems.

The SAFECOM system originated as a voluntary reporting system for the identification and tracking of hazards in an effort to prevent mishaps. The purpose of the SAFECOM system is for accident prevention through trend analysis. It is a tool used to encourage the reporting of any condition, observance, act, maintenance problem, or circumstance which has the potential to cause or prevent an aviation or aviation-related accident. While it is imperative that problems and issues be addressed at the local level, it is beneficial to share problems and solutions system-wide.

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. SAFECOMs should be utilized in tailgate safety sessions, after action reviews, and briefings only after they have been properly managed through the system.

Categories of reports include aircraft mishaps, aviation hazards, aircraft maintenance deficiencies, and airspace intrusions. The system uses the SAFECOM (Form FS-5700-14) to report any condition, observance, act, maintenance problem, or circumstance which has potential to cause an aviation-related mishap. Submitting a SAFECOM is not a substitute for "on-the-spot" correction(s) to a safety concern, rather it is a tool used in the documentation, tracking, and follow-up corrective action(s) related to a safety issue.

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. SAFECOMs contain information subject to the Privacy Act of 1974, 5 U.S.C. § 552a that must be protected and safeguarded. 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. Incident Air Operations Units and Incident Communication Centers have no authority to receive SAFECOMs from the field or distribute this information. Misuse of the SAFECOM system jeopardizes the communication needed for the SAFECOM system to work effectively.

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.

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.

Aviation Safety and Aircraft Mishap Information Dissemination.

Responsibilities.

(1) WO Branch of Risk Management and Training Systems shall ensure all SAFECOMs are stored in the electronic database and access is provided to aviation management personnel. Periodic safety summaries and annual reporting are the responsibility of this office. Appropriate follow up shall be taken on all Agency aviation safety concerns.

(2) Regional Aviation System Safety Managers (RASSM). The responsibility for regularly reviewing SAFECOMs submitted for their region and taking appropriate action rests with the RASSM. RASSM are encouraged to provide feedback to SAFECOM submitters and to solve aviation safety problems at the lowest level possible. RASSMs are encouraged to review the National database. National level problems should be forwarded to the WO Branch Chief of Aviation Risk Management and Training Systems.

(3) All Employees have the responsibility to report any condition, observance, act, maintenance issue, or circumstance that has the potential to cause an accident, incident or other mishap. It is essential that our culture maintains a commitment to reporting in order to facilitate the highest level of situational awareness.

(4) All Employees have the responsibility to report any condition, observance, act, maintenance issue, or circumstance that has the potential to have a **positive effect** on safety in aviation operations.

The SAFECOM system contains specific information concerning vendors, aircraft tail numbers, and pilot names that link them to specific acts. As a result, misuse of that information, although unintentional, has occurred. The intent of this system is for internal purposes only & should not be utilized for punitive action.
The following are examples of how SAFECOM information MUST NOT BE USED:
* Claims:
-SAFECOM information is not intended to be used to support claims. All information gathered for this purpose must come from other sources.
* 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.

Aviation Safety Awards

Individuals and organizations may be recognized with awards for exceptional acts or service in support of Forest Service aviation safety and aircraft mishap prevention. A fundamental responsibility of aviation leadership is to promote and use innovation in operations, equipment, and doctrine to meet changing and future requirements. It is necessary to keep pace with escalating complexity and managing risk. Rewarding

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

Airward Program: The WO Branch of Risk Management maintains this program in cooperation with the RASSMs to recognize aviation personnel actions that enhanced safety of specific operations. Individuals and organizations may be recognized with awards for exceptional acts or service in support of Forest Service aviation safety and aircraft mishap prevention.

Aviation awards are intended for Forest Service employees and units, other local government employees and organizations, and non-government individuals 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.

Nomination Procedures:

1. Submit nominations for aviation safety awards to the Branch Chief, Aviation Risk management and Training Systems or the Regional Aviation Safety Manager.

2. Nominations for awards should include a complete written description of the event, complete with:

a. Full name and crew duty position or non-crewmember description of the person, or persons, directly responsible for the extraordinary action.

b. Date, time, and location of the occurrence.

c. Mission or project being conducted at the time of the occurrence.

d. Flight profile phase when emergency occurred; for example, take off, climb, hover, or approach.

e. Action taken by the nominee(s) to cope with the emergency or minimize damage or injury.

f. A copy of the completed Form FS-5700-14, SAFECOM: Aviation Safety Communiqué (OAS-34), as official record of the circumstances.

Length of Service Safe Flying Award for Pilots

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

1. Eligibility. **Safe Flying Award:** 1,000 hours or five years of accident-free flight time; additional awards may be issued for each successive 1,000 hours and/or 5 additional years of accident free flying.

2. Standards. Only pilot-in-command flight hours qualify for this award. All flight time submitted must have been recorded in a pilots log book and verified by the approving official. Dates for consideration need not be consecutive and computation dates begin on the day the nominee was issued their private pilot certificate. 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.

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

- Full name, social security number, and pilot's certificate number issued by the Federal Aviation Administration;
- Pilot's position and job series, GS-2181 or -2101
- Verification of flight time and years as a pilot.

4. Exceptions. Incidents involving pilot negligence or an aviation hazard where any careless or reckless operation by the pilot has been verified, may be cause for non-selection of a pilot nominated for this award. Nomination officials may request an exception for pilots who have experienced relatively minor incidents or damage. The facts of such an occurrence must be fully documented in an attachment to the nomination.

SMS Documentation and Records

All documents, records and official correspondence issued by the Branch of Risk Management will be maintained for a minimum of three years in accordance with FOIA standards. WO Risk Management maintains the SMS library which contains the following documents and records:

- Accident/Incident with Potential reports and the associated database
- SAFECOMs
- SAFETY ALERTS
- Safety Audits
- Program Reviews
- Lessons Learned
- Technical Bulletins
- Aviation Accident Prevention Bulletins
- Safety Summaries
- Safety Awards

APPENDIX A

Operational Risk Management - Time Critical ORM

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

Apply the following principles of Risk Management to your mission:

- **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.

- **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.

- **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.

GO –NO – GO decision:

Use this simple **Questioning technique** to reduce risk in every mission you fly.

1) **Why am I doing it at all ? Is this flight necessary?**
2) **What could go wrong ?**
3) **How will it affect me or others ?**
4) **How likely is it to happen to me ?**
5) **What can I do about it ?**

Decision Making: There are five options when deciding how to mitigate the effects of high risk environment.

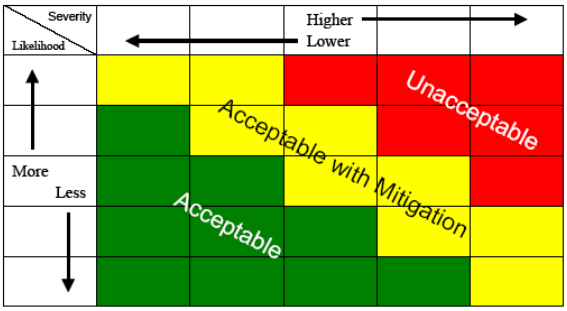
- **Avoid**: Most effectively done by making a "NO-GO" decision.
- **Reduce**: Hazards must be mitigated to an acceptable level of risk and controls are in place.
- **Spread:** Mission is redefined to reduce risk by spreading the exposure through several steps, or systems.
- **Transfer**: Redefine the mission to transfer risk to another process i.e. air transport to ground transport.
- **Accept:** Hazards do not represent a significant risk and the "Go" decision is accepted without further mitigation.

When making the final decision to **Go** with a flight or **Not to Go**, you can use the following questions as a guide.

- Who is in charge?
- Are all hazards identified and have we made them known?
- Are any of the following conditions significantly hazardous enough to threaten success of this mission?
    - Weather or visibility
    - Wind or turbulence
    - Communications
    - Personnel
    - Conflicting priorities or confusion
    - Other unsatisfactory conditions depicted on the Hazard Map of the local operating area, landing zone, airspace, etc.
- Is there a better way to do it?
- Are you driven by sense of urgency? External pressure?
- Can you justify actions being taken to get the job done?
- If there are other aircraft in the ATA, is there adequate coordination?
- Are you having to deviate from best practices or rules?
- Is your intended flight different from the original flight plan?

ORM Matrix

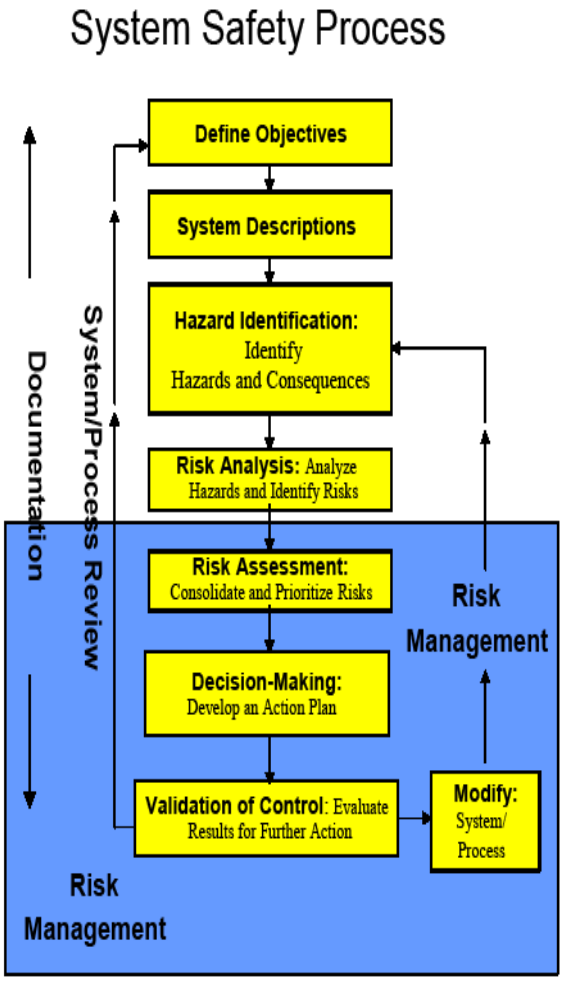
The following matrix is the most simple way of gauging the risk levels of identified hazards. I should be used as a quick reference when answering the elements described in the above paragraphs.



APPENDIX B

Operational Risk Management - Deliberate ORM

4. **Deliberate.** This ORM 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, cost-benefit analysis, implementation of controls, and supervision. This will involve documentation of the process and actions. Examples of the tools in use are project aviation safety plans and job hazard analysis.



Define Objectives

Objectives need to be well defined; is the m
method for accomplishment. The objective
whether or not aviation is an option to consi
an aircraft operation is determined to be the
process must be utilized to determine the ac
use the risk management process "after-the-
by operational managers.

The intent of this first step in the process is
determine how appropriate the use of aviati
answered **prior to beginning the risk man**

In terms of the three levels the objective of
or strategic.

System Description

Aviation personnel will analyze systems, op
an understanding of critical design and per
identify hazards.

System and task descriptions will be develo

The systems approach must include all
success of the operational mission. In this
must be considered when identifying hazarc

Hazard Identification

Hazards are the potential sources of danger
task or mission, to include a condition, event, or circumstance that could lead to or contribute to an unplanned or undesired event. Hazard identification is a brainstorming session where we answer the question what could possibly go wrong and what if. An aerial hazard analysis is completed jointly by the Project Aviation Manager, the Helicopter Manager, the Dispatcher, and the unit Aviation Manager.

Hazards are captured in two processes.
1) Deliberate Risk Assessment process is required in the PASP
2) Hazard Maps are required for each Region and must be reviewed during the PASP process.

Aviation personnel will identify and document the hazards in operations that are likely to cause death, serious physical harm or damage to equipment or property in sufficient detail to determine associated risk and determine acceptability.

Once hazards have been identified, this process also determines the consequences and effects of the hazard becoming an event.

Hazards will be identified for the entire scope of the system, as defined in the system description and documented. Hazard information will be tracked, and managed through the entire SRM process.

Risk Analysis

Risk Analysis is the disassembling of hazard consequences to identify what can happen if a hazard is not mitigated.

Personnel representing the involved systems may be considered in the process such as the Helicopter or Project Flight Manager, the Dispatcher, the unit Aviation Manager and Line Manager, and ultimately the Pilot, who has the authority to decline a mission which he or she considers excessively hazardous.

Any flight mission has a degree of risk **exposure** which varies from 0% exposure (no flight activity is conducted) to 100% exposure (aircraft and/or personnel experience a mishap).

RISK CONTINUUM

0% Exposure | --I----------I ----------I ---------- I 100% Exposure

(NO FLIGHT) > < (MISHAP OCCURS)

Risk Assessment

Risks can be defined as an expression of the impact of an undesired event in terms of event severity and event likelihood.

Aviation personnel must determine the severity and likelihood of potential events associated with each identified hazards and other factors-associated with unacceptable levels of risk.

The risk analysis process will consider existing safety risk controls; triggering mechanisms; and risk of reasonably likely outcomes from the existence of a hazard.

Risk likelihood and severity may be expressed in quantitative or qualitative terms.

One aspect of a deliberate risk assessment is to determine the risk levels based upon the following 4 – level chart. The result is a quantification of the risk associated with the operation: High, Serious, Medium, or Low.

- **High**: The combination of severity and likelihood indicate that hazard has a greater than 50% chance of exceeding control measures and the result will be critical or catastrophic.
- **Serious**: 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 have been identified that still need to be mitigated to an acceptable level.
- **Medium**: Degree of risk is such that it is fairly certain that the mission can be accomplished safely. Hazards exist, and have been mitigated to an acceptable level.
- **Low**: Little or no impact on mission accomplishment. Hazards are those normally associated with flight that cannot be eliminated.

*Refer to the decision making section to identify acceptance protocols and controls associated with each of the levels of risk identified above.

RISK ASSESSMENT MATRIX				
	Severity			
Likelihood	Negligible	Marginal	Critical	Catastrophic
Frequent				
Probable				High
Occasional			Serious	
Remote		Medium		
Improbable	Low			

Use the Risk Assessment Matrix and the attached Risk Assessment Worksheet as an example for likelihood and severity documentation.(Rework format to be a whole page)

AVIATION RISK ASSESSMENT WORKSHEET

Assess the risks involved with the proposed operation. Use additional sheets if necessary.				
Assignment:	**Date:**			**Acceptable Risk?**
Describe Hazard:	Likelihood	Severity	Risk Level	Yes/No
Mitigation:				
Describe Hazard				
Mitigation:				
Describe Hazard				
Mitigation:				
Operation Approved by Title:				Date:

IMPORTANT NOTE: Be aware that the initial assessment of risk(s) may indicate an unacceptable level when compared to the expected benefit. However, once controls are determined, the risk assessment may indicate a lowered risk that may be acceptable when compared with the benefit of the operation.

Developing an Action Plan

- Mitigations and controls should be defined for each known hazard. Be aware that newly developed mitigations and controls may also result in unforeseen hazards, therefore mitigations and controls must be continuously validated.

Mitigation- Preventive actions eliminate or reduce the effects of a potential hazard or other undesirable situation. Risk mitigations will be clearly described; evaluated to ensure that the expectations have been met; ready to be used in the operational environment for which they are intended; and documented.

Controls - Organizational process controls are typically defined in terms of special procedures, supervisory and management practices and processes. Many controls are inherent features of the SMS guide. Such practices as continuous monitoring, internal audits, internal evaluations, and management reviews (all parts of the safety assurance component) are identified as controls within the design expectations. Additionally, other practices such as documentation, process reviews, and data tracking are identified as controls within specific elements and processes.

Validation of controls and mitigations - The intent of validation is to maintain a constant monitoring process to ensure that controls and mitigations are effective and appropriate. This last step begins the transition from the risk management process into the Safety Assurance component of SMS.

APPENDIX C

Strategic Risk Management - Program Level Analysis

Strategic/In-Depth. Strategic Risk Management is conducted at the highest levels of the organization and is typically applied to "systems of systems" type complexity. This method should be used in instances where new technology or a change in process is being proposed, when risks appear consistently high, and time and resources dictate a thorough assessment. Risk management at this level requires more sophisticated techniques and professional reviews. It involves an additional seventh step in first identifying the objective of the risk assessment being conducted (change assessment, program specific, accident action plan, other). Program-wide risk assessments are an example of this method.

Specific Probability Effect (SPE) Threat Assessment
In order to document any specific threats or hazards and the mitigations that may be applied the use of a specific analysis for each threat may be appropriate. The Specific Probability Effect (SPE) Model provides such a tool. As an example, SME's have completed a survey of hazards that affect helicopter operations using this model. An example of this assessment concerns operations as shown in the chart below;

The complete review of program risk analysis is available by accessing the following site.
http://www.fs.fed.us/fire/av_safety/Systems_Safety/av_risk_mgt/

Instructions for Using the Risk Assessment Spreadsheet:
In using this model each of the threats is analyzed to determine (1) the effect on the mission, policy and environment, personnel, and equipment (the system) should the hazard be encountered, and (2) the likelihood that the threat/hazard will be encountered. The portion of the model devoted to effect, will include the combination of exposure and the severity of the threat.

Evaluation Model Description

Figure 3 – Rating Matrix for Rating Hazards Pre-Mitigation and Post-Mitigation

					Severity				
					No effect no damage	No lost time injury Minor dings	Loss time injury Damage ≤ 3 days	Serious injury Replace Aircraft	Death Total the Aircraft
					Extremely Low	Low	Moderate	High	Extreme
		Probability	Signifcance		1	3	9	12	15
Probability or Significance	5 yr+	Extremely Low	Very Low	1	2	4	10	13	16
	1 yr	Low	Less	2	3	5	11	14	17
	3 mo	Moderate	Moderate	3	4	6	12	15	18
	1 wk	High	Very	4	5	7	13	16	19
	daily	Extreme	Most	5	6	8	14	17	20

Rating
Extreme
High
Serious
Medium
Low

Figure 4 – Definin

The classifications and the resultant rating matrix is shown in Figure 3. The SME assigns a numeric value to each classification. The sum of these two numbers becomes the score for each combination of probability/significance and severity. The SME structures the scores into five rating classes are shown in Figure 4.

Rating of Hazards and Mitigation Measures With Benefits and Costs

A listing of the hazards and mitigation measures follow, including ratings for pre-mitigation, post-mitigation and benefit~cost.

The SME must assign a numeric value to each classification. The sum of these two numbers became the score for each combination of cost and benefit.

Figure 6 – Scores

Defining the Ratings

Score	Rating
10-12	Very High
7-9	High
4-6	Medium
2-3	Low

Figure 5 – Rating Matrix for Costs and Benefits Pre-Mitigation and Post-Mitigation

					Benefit			
					Minor Improvement	Moderate Improvement	Significant Improvement	Substancial Improvement
					Low	Moderate	High	Very High
					1	3	6	8
Cost	$1M+	Very High		1	2	4	7	9
	$100K-$1M	High		2	3	5	8	10
	$10-100K	Moderate		3	4	6	9	11
	0-$10K	Low		4	5	7	10	12

Rating
Very High
High
Medium
Low

4.3 Hazard analysis and tracking

A. The primary process used to manage the USFS safety program is the Seven-step risk-management model. The Hazard Analysis and Tracking program is used to assess and develop control options for hazards/violations identified through various other processes such as surveys, job-hazard analyses, SAFECOM's and accident reports.

B. Hazards/violations will be analyzed with a goal of finding their root causes; they will be translated into risk levels or risk-assessment codes (RAC) (low, moderate, high, and extremely high) by prioritizing them in terms of probability of occurrence and severity of impact.

C. This process will be used to develop and recommend control options that eliminate unnecessary hazards or violations at their root cause or reduce hazard residual risk to an acceptable level consistent with successful mission accomplishment. Controls will be developed for those hazards/violations that present the highest risk first. Ensure that implementation of a control measure does not create additional unnecessary risk. Safety Managers at all levels will assist in the decision-making process by identifying which control options best support mission success and protect resources.

D. Safety Managers at all levels will evaluate hazard controls after implementation to ensure their effectiveness and applicability.

E. A file/log of hazards will be maintained to track control-option implementation and effectiveness. The file/log will be maintained as a permanent reference for future hazard analysis. The file/log contains the following elements:

(1) A reference or log number.
(2) Description of the hazard, including source or root cause.
(3) Determination of potential impact on the organization / mission (RAC).
(4) Recommended control options.
(5) Appropriate level of decision on control options and implementation directives, including responsible agent and suspense.

F. Feedback will be provided through appropriate channels on hazards that affect other organizations or systems.

G. The Hazard Probability and Severity Charts will be used to objectively identify Probability and Effect, which will then be converted to the appropriate Risk Assessment Code (RAC) for entry onto the Hazard Log.

1.1.1.1 Hazard Probability (Liklihood) Chart

Frequent (A) Occurs very often, continuously experienced	
Single item	Occurs very often in service life; expected to occur several times over duration of a specific mission or operation; always occurs
Fleet or inventory of items	Occurs continuously during a specific mission or operation or over a service life
Individual	Occurs very often in a career; expected to occur several times during mission or operation; always occurs
All individuals exposed	Occurs continuously during a specific mission or operation
Probable (B) Occurs several times	
Single item	Occurs several times in service life; expected to occur during a specific mission or operation
Fleet or inventory of items	Occurs at a high rate but experienced intermittently (regular intervals, generally often)
Individual	Occurs several times in career; expected to occur during a specific mission or operation
All Individuals exposed	Occurs at a high rate but experienced intermittently
Occasional (C) Occurs sporadically	
Single item	Occurs sometime in service life; may occur about as often as not during a specific mission or operation
Fleet or inventory of items	Occurs several times in service life
Individual	Occurs sometime in career; may occur during a specific mission or operation but not often
All Individuals exposed	Occurs sporadically (irregularly, sparsely, or sometimes)
Remote(D) Remotely possible; could occur at sometime	
Single item	Occurs in service life but only remotely possible; not expected to occur during a specific mission or operation
Fleet or inventory of items	Occurs as isolated incidents; possible to occur sometime in service life but rarely; usually does not occur
Individual	Occurs as isolated incident during a career; remotely possible but not expected to occur during a specific mission or operation
All Individuals exposed	Occurs rarely within exposed population as isolated incidents

Improbable (E) Can assume will not occur, but not impossible	
Single item	Occurrence not impossible; but may assume will almost never occur in service life; may assume will not occur during a specific mission or operation
Fleet or inventory of items	Occurs very rarely (almost never or improbable); incidents may occur over service life
Individual	Occurrence not impossible but may assume will not occur in career or during a specific mission or operation
All Individuals exposed	Occurs very rarely but not impossible

Hazard severity chart

Catastrophic (I)	Loss of ability to accomplish the mission or mission failure; death or permanent total disability (accident risk); loss of major or mission-critical system or equipment; major property (facility) damage; severe environmental damage; mission-critical security failure; unacceptable collateral damage
Critical (II)	Significantly (severely) degraded mission capability or readiness; permanent partial disability; temporary total disability exceeding 3 months time (accident risk); extensive (major) damage to equipment or systems; significant damage to property or the environment; security failure; significant collateral damage
Marginal (III)	Degraded mission capability or readiness; minor damage to equipment or systems, property, or the environment; lost day due to injury or illness, not exceeding 3 months (accident risk); minor damage to property or the environment
Negligible (IV)	Little or no adverse impact on mission capability; first aid or minor medical treatment (accident risk); slight equipment or system damage but fully functional and serviceable; little or no property or environmental damage

Title Project Aviation Safety Plan

1.2 Your National Forest or District

Mission:	Project Name:	Unit:
Anticipated Project Date:	Start Time:	Ending Time:
Project Plan Prepared by:	Title:	Date:

Note: Signature by the preparer verifies that all personnel have the required training for the mission.

Attach Map, clearly showing areas to be flown; aerial hazards must be indicated.

Project Plan Reviewed by:	Title:	Date:
Project Plan Reviewed by:	Title:	Date:
This Flight is Approved by:	Title:	Date:

Project Description:

Attachments: ☐ Map	☐ Other:	
Project Supervisor:	Phone:	Cell:
Helicopter Manger:	Phone:	Cell:

Participants:

Type of Flight:	Desired Aircraft Type:	Charge Code:
Type Procurement:	Method of Payment:	Projected Cost:

Vendor:		Phone:	Cell:
Aircraft N#:	Make & Model:	Aircraft Color:	
Pilot Name:		Pilot Carded: ☐Yes ☐No	A/C Carded: ☐Yes ☐
Flight Follow:		Request or Flight #:	
Method of Resource Tracking: ☐ Phone ☐ Radio		☐ Prior to Takeoff ☐ Each Stop Enroute ☐ Arrival at De	
Scheduling Dispatch Phone:		Destination Dispatch Phone:	
FM Receive:	FM Transmit:	Tones:	
FM Receive:	FM Transmit:	Tones:	
FM Receive:	FM Transmit:	Tones:	
AM Air to Air:	AM Unicom:	Other:	

Search and Rescue Procedures: Contact Dispatch, Follow the Aviation Mishap Response Guide

Start Location	Latitude	Longitude	Elevation	Runway length & Surface or Helispot
Destination Location	Latitude	Longitude	Elevation	Runway length & Surface or Helispot

Passenger Name	Weight	Departure Point	Destination Point
Cargo Weight	Cubic Feet	Hazardous Material	Destination
		☐Yes ☐No	
		☐Yes ☐No	
		☐Yes ☐No	

Type of Flight	Personnel Protective Equipment Requirements
☐ Air Ops general/ground personnel	Nomex clothing, hardhat w/chin strap, gloves, leather boots, eye protection, hearing protection, fire extinguisher
☐ Fixed Wing point to point flights	Hearing protection
☐ Fixed Wing mission flights	Nomex clothing, gloves, leather boots, hearing protection
☐ Rotor Wing flights	Flight helmet, Nomex clothing, gloves, leather boots, eye protection, hearing protect approved secondary restraint harness for doors off flights, PFD for all PAX as requi

Justification statement for low-level flights:

Special Instructions:

2. Aircraft Manager must confirm with Dispatch prior to the flight that affected routes' Schedulers contacted for Route Activity

3. Military Training Route (MTR) Information

MTR	Route Legs-Altitude	Activity	Time	Time Zo
☐		☐Hot ☐Cold	Start Stop	☐UTC☐P
☐		☐Hot ☐Cold	Start Stop	☐UTC☐P

☐		☐Hot ☐Cold	Start Stop	☐UTC☐P
☐		☐Hot ☐Cold	Start Stop	☐UTC☐P
☐		☐Hot ☐Cold	Start Stop	☐UTC☐P
☐		☐Hot ☐Cold	Start Stop	☐UTC☐P

4. Military Training Route (MTR) Information

MTR	Route Legs-Altitude	Activity	Time	Time Zo
☐		☐Hot ☐Cold	Start Stop	☐UTC☐P

5. Military Training Route (MTR) Information

MTR	Route Legs-Altitude	Activity	Time	Time Zo
☐		☐Hot ☐Cold	Start Stop	☐UTC☐P
☐		☐Hot ☐Cold	Start Stop	☐UTC☐P
☐		☐Hot ☐Cold	Start Stop	☐UTC☐P
☐		☐Hot ☐Cold	Start Stop	☐UTC☐P
☐		☐Hot ☐Cold	Start Stop	☐UTC☐P
☐		☐Hot ☐Cold	Start Stop	☐UTC☐P

Job Risk Analysis: Aircraft manager/pilot review with all participants as part of preflight briefing

Is everything approved with clear instructions, aviation plan signed and reviewed?	☐ Yes	☐ No	☐
Are communications and flight following established, including repeater tones?	☐ Yes	☐ No	☐
Can terrain, altitude, temperature or weather that could have an adverse effect be mitigated?	☐ Yes	☐ No	☐
Are all aerial hazards identified and known to all participants?	☐ Yes	☐ No	☐
Have mitigating measures been taken to avoid conflicts with military or civilian aircraft	☐ Yes	☐ No	☐
Have adequate landing areas been identified and or improved to minimum standards	☐ Yes	☐ No	☐
Are all agency personnel qualified for the mission?	☐ Yes	☐ No	☐
Is the pilot carded and experienced for the mission to be conducted?	☐ Yes	☐ No	☐
Are there enough agency personnel to accomplish the mission safely?	☐ Yes	☐ No	☐
Will adequate briefings be conducted prior to flight to include Pilot, Passengers and Dispatch?	☐ Yes	☐ No	☐
Are all involved aware that the pilot has the final authority, but if any passenger feels uncomfortable, that they can decline the flight without fear of reprisal?	☐ Yes	☐ No	☐
Is the aircraft capable of performing the mission with a margin of safety?	☐ Yes	☐ No	☐
Have manifests of cargo and passengers, load calculations and/or weight & balance completed?	☐ Yes	☐ No	☐
Is the aircraft properly carded?	☐ Yes	☐ No	☐
Do all personnel have the required PPE?	☐ Yes	☐ No	☐
Fuel planning, adequate fuel on board, fuel truck location, availability of commercial fuel?	☐ Yes	☐ No	☐
Remember; maps of areas/sites, handheld radios, cell phones, day/survival packs, sic sacks	☐ Yes	☐ No	☐
Will the mission be conducted at low levels? (Below 500' AGL)	☐ Yes	☐ No	☐
Can the same objective be achieved by flying above 500' AGL?	☐ Yes	☐ No	☐
Are pilot flight and duty times compromised?	☐ Yes	☐ No	☐
Is there an alternative method that would accomplish the mission more safely?	☐ Yes	☐ No	☐

5.1.1.1 Helicopter Mgr. Signature:	5.1.1.2	5.1.1.3 Date:	5.1.1.4 Pilot Signature:	5.1.1.5	5.1.1.6

5.1.1.7

5.1.1.8 Job Hazard Analysis: Aircraft manager/pilot review with all participants as part of preflight briefing

Hazard	Hazard Mitigation
MTR's	Practice risk management. Check routes in advance, confirm that Dispatch has made calls
Private aircraft	See and avoid. Transmit in the blind on 122.925 near backcountry airstrips
Airport traffic	Stay in radio contact. Announce intentions, use established patterns
Weather	Use weather advisory. Maintain VFR minimums. Cancel mission if conditions deteriorate
Terrain	Avoid performance related situations, cross terrain at it's lowest point, consider downdrafts
Low level obstacles	Complete a high level recon, no unnecessary low level flight
Unimproved landings	Recon LZ. Download on first load. Stay in radio contact
Doors off helicopter operations	Use approved secondary restraint harness. Remove loose items from cabin

Pilot not familiar with area	Supply hazard maps. Complete high level recon prior to low level work
Noise, rotor wash	Wear ear and eye protection, utilize dust abatement
Internal and external loads	Have trained personnel assigned to the mission, plan around fuel, Hook and equipment check
Unplanned aircraft events	All personnel equipped with required PPE and trained in crash procedures, maintain flight fol
Hazardous materials	Trained personnel will handle, inform pilot, utilize Hazmat guide w/current exemption
Non aviation personnel	Maintain control, provide through briefings
Communications	Maintain communications at all times, establish backup options, and know alternate frequenc Take handheld radio along. Call in prior to landing. If radio contact is lost, climb, check ton unable to re-establish, return to best suitable landing area and check in
Overload conditions/CG issues	Complete accurate load calculations and/or Weight and Balance
Wintertime operations	Use appropriate clothing for varying altitudes/climatic conditions, utilize winter survival kit
Prop/Rotor hazards	Pilot perform aircraft safety brief, Approach/Depart sensibly after shutdown & prop/rotor sto
Multiple project aircraft	Adequate aerial supervision. Carded managers for each aircraft. Establish and maintain separation, utilize common frequencies communications
Aircraft Fueling	Vendor responsibility. No agency personnel onboard. Aircraft shutdown unless closed circui open port in accordance with NFPA 407 3-21, 4073-21.2(b). Trained personnel staff extingu
Line Officer Signature or Authorized Representative:	**Date:**

Chart 3-2:
Risk Assessment

6. Matrix

			7. HAZARD PROBABILITY				
			Frequent	Likely	Occasional	Seldom	Unlikely
			A	B	C	D	E
7.1 EFFECT	Catastrophic	I	Extremely High				Medium
	Critical	II		High		Medium	
	Moderate	III	High	Medium			
	Negligible	IV	Medium	Low			

RISK ASSESSMENT WORKSHEET

Assess the risks involved with the proposed operation. Use additional sheets if necessary.

Assignment: Date: **Describe Hazard:**	Probability (A-E)	Effect (I-IV)	Risk Level
1.			
2.			
3.			
4.			
5.			

6.			
Mitigation Controls:	Probability (A-E)	Effect (I-IV)	Risk Level
1.			
2.			
3.			
4.			
5.			
6.			

FINAL RISK EFFECT: **LOW MEDIUM HIGH** **(CIRCLE ONE)**

Operation Approved by: Title:
Date:

PROJECT AVIATION SAFETY PLAN BRIEFING

Project Aviation Safety Plan Briefing

A copy of this briefing page will be submitted to the Forest Aviation Officer within 5 days of the completion of this project.

Briefing Leader: _____

Briefing Date: _____ Time: _____ Location: _____

Discussion Items:

__ a. Hazard Analysis (as outlined in plan)

__ b. Safety Air Ops (Ground)

__ c. Safety Air Ops (Flight)

__ d. Military Training Routes

__ e. Flight Following

__ f. Frequencies

__ g. Fueling

__ h. Emergency Evacuation. Plan

__ i. Authorities

__ j. Weather Considerations

__ k. Other

__ L. other

Attendees Signature and Concurrence:

APPENDIX D

Information to be reported to CARM in the event of aviation related incidents or mishaps

(1) Type, nationality, and registration marks of the aircraft.

(2) Name of owner and operator of the aircraft. (operator is defined at the unit in operational control of the aircraft, such as the agency that ordered it through the ICS)

(3) Name of the pilot-in-command.

(4) Date and time of mishap, malfunction, or failure.

(5) Last point of departure and point of intended landing of the aircraft.

(6) Position of the aircraft with reference to some easily defined geographical point.

(7) Number of persons aboard and number killed or injured.

(8) Nature of the incident or occurrence, the weather, and the extent of damage to the aircraft, so far as is known.

(9) A description of any explosives, radioactive materials, or other dangerous articles carried