SOUTHWESTERN REGION

AVIATION SAFETY

and

AVIATION MANAGEMENT PLAN

2009

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I. PURPOSE

This Plan defines the aviation program in Region 3. The plan identifies the responsibilities of the Regional Aviation program managers, identifies each position within the organization, and lists tasks and responsibilities.

This Plan addresses the operational and safety policies of Region 3 and identifies the methods used to achieve those policies. The operational policies and methods used are intended to be consistent with national policy and pertinent Federal Aviation Regulations (FAR's). The National Aviation Management Plan, along with this plan, are to be used by the forests, in conjunction with the Forest Aviation Plan, to plan and execute aviation programs and projects.

The intent is for the Southwestern Region Aviation Safety and Aviation Management Plan, the Aviation Accident Prevention Plan, the National Aviation Management Plan and the Forest Aviation Plan to be combined with an updated Incident/Accident Response Guide and to be assembled in one binder. This would place most pertinent aviation material in one place for the Forest Aviation Officer and other aviation users. Forest Service Manual 5700, Forest Service Handbooks related to aviation and aviation guides must also be current and available on each forest and aviation base.

II. AVIATION MANAGEMENT OBJECTIVE AND OPERATIONAL PHILOSOPHY

The objective and philosophy of aviation management is to provide the Region a safe, cost-effective, and efficient aviation program. It is the intent of the aviation group within the fire organization to maintain a competent, experienced technical staff at the Regional level to advise the Forests in aviation matters.

III. POLICY

a) All aviation operations performed within the Region shall comply with national standards, published directives, aviation contracts, and applicable Federal Aviation Regulations. It is the policy of the Southwestern Region Aviation Unit to follow all applicable rules and regulations pertaining to aviation. These rules and regulations are found in Forest Service Manual 5700, Forest Service Handbooks (5709.16 Flight Operations Handbook), and in Interagency Guides such as: Interagency Helicopter Operations Guide, Leadplane Operations Guide, Aerial Ignition Guide, Helirappel Guide, Airtanker Base Operations Guide, Air Attack Operations Guide, Single Engine Airtanker Operations Guide, Interagency Smokejumper Operations Guide, Interagency Smokejumper Pilots Operation Guide, Southwestern Region Single Engine Operations Plan..

b) Each Forest shall supplement this plan with forest level Aviation Plans containing more specific details relating to aviation operations conducted on or for the forest. The Forest Aviation Plan, and the Forest Aircraft Incident/Accident Response Guide, shall be reviewed and updated annually.

c) Each Forest shall supplement the Regional Aviation Security Plan with **forest level base security plans** for permanent bases of aviation resources. Aviation Base Security Plans shall be updated, reviewed, and approved annually. Forest Aviation Base Security Plans must be approved (signed) by the Forest Supervisor. Prior to approval, the Forest Aviation Officer (FAO), the Regional Aviation Officer (RAO), and the Regional Aviation Safety Manager (RASM) must review Forest Aviation Base Security Plans.

d) All Forest Service aviation operations must be addressed in a written plan. Those operations not covered in FSM or FSH, the National, Regional, or Forest Aviation Plan must be addressed in a **project aviation plan**. (See example project aviation plan in Appendix B).

e) All aviation plans must be reviewed and approved. Forest Aviation Plans must be approved (signed) by the Forest Supervisor. Prior to approval, the Forest Aviation Officer, the Regional Aviation Officer, and the Regional Aviation Safety Manager must review Forest Aviation Plans. Project Aviation Plans must be reviewed by the FAO, RAO and RASM, depending on the level of complexity, and approved by the District Ranger for non-complex aviation projects, and by the Forest Supervisor for complex aviation operations**. (see appendix for copy of "Forest Aviation Plan Checklist" and a sample Project Aviation Plan outline)** A few examples of complex aviation projects are: aerial ignition, aerial mulching, and projects using two or more types of aircraft.

f) Project planning should include the use of the **End-Product Exhibit matrix** (FSM 5711.21) to determine if a project should be managed as an end product contract or flight services contract.

g) During the calendar year, if a forest has a complex project aviation plan reviewed by the Regional Office for a project, then any similar projects will not need a Regional plan review, if the plan does not change substantially. For example, an aerial ignition plan for burn A is reviewed by the Regional Office in the spring, so a Regional review of the aerial ignition plan for burn B in the fall is not necessary if the plan has not changed substantially.

IV. PROGRAM OVERVIEW

The aviation program within Region 3 involves the use of fixed-wing and rotor-wing aircraft for **Forest projects** and fire suppression activities. The fixed-wing aircraft encompass both large and small aircraft used for fire suppression, personnel transport, and to support other natural resource projects. The Region uses heavy, medium, and light rotor-wing aircraft for a variety of missions, mostly related to fire suppression, prescribed burns and other natural resource management projects.

Small fixed-wing and light rotor-wing aircraft are contracted for at the Regional level. The large fixed-wing and the heavy and medium rotor-wing aircraft are contracted for under a National contract**.** All Regional and National contracted aircraft are provided contract administration services through the Regional Contracting Officer. This person acts either as the Contracting Officer (CO) or as the Administrative Contracting Officer (ACO), depending on whether the aircraft and service is on a National or Regional contract. Call-When-Needed (CWN) contracts are administered through the Regional Aviation Contracting Officer (ACO) at the Regional Office.

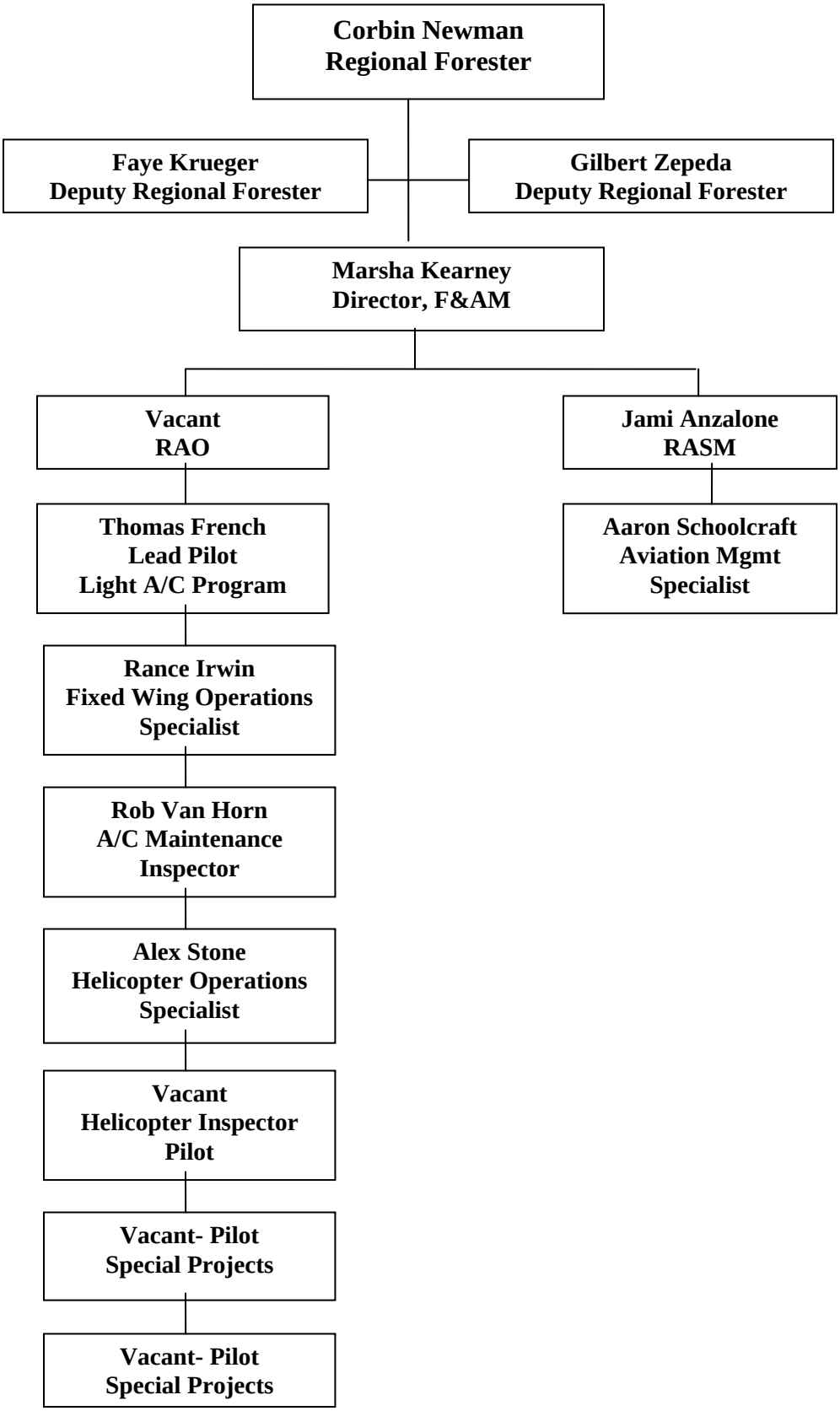
Several aircraft are specifically contracted to be operated and managed by Fire and Aviation Management (see Appendix C for current list of Agency operated aircraft assigned to R-3). The primary use of these aircraft is to support fire suppression activities. They are also available to support other Regional natural resource programs and activities. Access to these aircraft is through the Regional Aviation Officer. These aircraft are scheduled through the

Southwest Coordination Center (SWCC) when not assigned to an incident.

The Regional Aviation Group has the capability of supplying personnel transport, aerial supervision, and other natural resource aviation needs, such as aerial videography, infrared sensing, animal radio tracking, and other specialty aviation activities. Helicopter activities such as aerial ignition, animal counts, infrared and videography are also available through the Regional Helicopter Inspector Pilot.

The Regional Aviation Group must maintain close ties with each forest through the Forest Aviation Officer (FAO). By manual direction, each forest must designate a Forest Aviation Officer (FSM 5700). The relationship between the Regional Aviation Unit and the FAO is essential to maintaining a safe and efficient operation. One of the primary roles of the Aviation Unit is to provide support and guidance to the Forest through the FAO. This partnership is the cornerstone of the Regional aviation program.

V. ORGANIZATION AND STAFFING



1. POSITIONS OF RESPONSIBILITY

The underlying reason for aviation positions in the Regional Office organization is the institutional concern for aviation safety. All employees involved in aviation operations are responsible for taking a proactive approach to aviation safety. The proactive person has planned and organized duties in a way that allows events to be controlled, resulting in the desired outcome. Planning affords each of us the opportunity to anticipate possible complications in order to have an alternative. When events intervene, the proactive person will analyze the situation, discuss, evaluate, decide, and implement an alternative tactic.

Aviation organizations are comprised of diverse experts/professionals in a variety of positions that all have safety responsibilities. The following key positions provide the leadership, guidance, advisement, promotion, and liaison required to have a successful accident prevention program.

A. Regional Director, Fire and Aviation Management

The primary aviation safety role of the Regional Director is to provide overall leadership to the Regional and Forest fire and aviation organizations. This position is the focal point for setting the tone with each Forest Supervisor for the expected level of aviation safety, which is consistent with the Regional Forester's established safety expectations.

B. Regional Aviation Officer (RAO)

The primary role of the Regional Aviation Officer (RAO) is to provide program leadership and direction. This position is the focal point for setting the tone for the level of professionalism expected within the aviation function and executing a safe and effective Working Capital Fund (WCF) flight operation. The RAO and Aviation Staff communicate institutional values and level of acceptable risk to those executing and managing contract and internal aviation operations. The activities of the RAO are meant to unify the efforts of Regional aviation experts/professionals and develop a team approach in achieving safety goals and objectives while providing aviation support to the forests and cooperators.

The RAO is responsible for providing guidance, advice and support to the Forest Aviation Officers (FAO) from each National Forest in the Southwestern Region. As leader of the Regional Aviation Unit, the RAO is responsible for maintaining a fully qualified staff of aviation experts in order to support the forests in all phases of aviation activities.

1. RAO Responsibility

a. Monitor Forest, District and project aviation planning as well as qualifications of Forest Service employees involved in aviation operations.
b. Assist Forest Aviation Officers in the development of aviation-related plans and recommend changes to these Forest plans and aviation operations.
c. Provide assigned specialized aviation training to field units and employees.
d. Provide technical input to Contracting Officers for development of standard contract specifications.

e. Provide aircraft and pilot inspections and approvals as required by Forest Service direction, cooperative agreements, and contract specifications.
f. Conduct safety evaluations of field aviation operations on a regular basis.
g. Monitor contract and employee pilot performance and provide every opportunity for employee pilots to expand their knowledge and cultivate their skills.
h. Provide for training, check rides, and approvals of Forest Service aviation employees as required by Forest Service Manual, Handbooks, and operating guides.

C. Regional Aviation Safety Manager (RASM)

The Regional Aviation Safety Manager (RASM) serves as the principal advisor to the Director and RAO on all aviation safety matters and is a critical member of the Region's Aviation Management Team. This position is the focal point for the Region's endeavors in promoting safety awareness and developing safe attitudes in those people directly and indirectly involved in aviation operations. The RASM provides the concepts, principles, and procedures required for interfacing aviation safety practices into operational activities. Evaluations and appraisals are conducted to determine the level of compliance and effectiveness of existing aviation safety activities. The RASM recommends actions necessary to enhance the Forest Service aviation safety program.

The RASM is responsible for providing guidance, support and advice to the National Forests within the Southwestern Region regarding aviation safety issues. This is done primarily through the Forest Line Officers, Forest Aviation Officers, Dispatchers, and Aviation managers.

1. RASM Responsibility

a. Review monitoring of aviation planning, training, contract specifications, contract administration support, and recommend changes to the Director and RAO.
b. Participate on selected safety evaluations with other aviation staff members to review the ground operation monitoring programs and recommend changes to the RAO and Director.
c. Monitor follow-up actions on recommended actions from safety evaluations, from formal reviews, and from accident Boards of Review.
d. Review contract and employee pilot training and monitoring activities to ensure compliance with Forest Service direction and make recommendations for changes to the Director and RAO.
e. Ensure that all aviation accidents and incidents are investigated and corrective actions are followed up on to prevent future reoccurrences.
f. Provide trend monitoring of all accidents and incidents from 5700-14 reports, to help the RAO and Director prioritize the staff's time and activities to the areas causing the greatest safety risk potential.

D. Forest Aviation Officer (FAO)

The Forest Aviation Officer (FAO) is the primary authority for aviation activities that occur

at the Forest level. This position provides liaison between the Regional Aviation Staff, Forest management, and persons conducting aviation activities on the Forest. The FAO plans and organizes aviation projects by coordinating with aircraft operators and ensuring compliance with policies and regulations governing air operations. This is the central point of convergence for the gathering and dissemination of information that emphasizes the Agency's, Regional Forester's, Forest Supervisor's, and District Ranger's concern for conducting safe aviation operations.

1. **FAO Responsibilities**
   a. Ensure that Forest Plans, Forest Aviation Plans, Aviation Base Security Plans, Aviation Project Plans, Aviation Crash/Rescue Plan, Aviation Base Operating Plans, Fire Management Action Plans, and other aviation-related plans are developed, complete, apply to the actual activity, and address aviation safety and security needs.
   b. Ensure that all aviation-related plans are approved by the appropriate Forest Line Officer, employees working on aviation activities are aware of the plan contents and limits, and lines of authority and responsibility are established and understood in general and on individual operations.
   c. Provide coordination between forest aviation planning activities and aviation operations with the appropriate Regional aviation specialist.
   d. Monitor Forest Service and contract pilot performance and request RAO assistance in resolving any areas of concern to assure safe aviation operations.
   e. Ensure that Forest Service and contract employees are properly trained for the activity and job they are assigned to accomplish in their ground support operations.
   f. Monitor all aviation ground support operations for compliance to the approved Forest plans, safety practices and ensure any non-compliances are corrected.

2. **FAO Activities**

   a. Analyze aviation safety needs, problem areas, and preventive measures.
   b. Advise planners regarding aircraft suitability for overall needs or specific projects.
   c. Compare capabilities and costs of various aircraft and systems in relation to planned needs.
   d. Analyze aviation training needs such as air observers, helicopter crewmembers, aviation base workers, and COR liaison for all forest employees.
   e. Participate in aviation training.
   f. Secure and provide information and technical direction for all Forest aviation operations.
   g. Participate in aviation programs with cooperators.
   h. Coordinate technical inspections and approvals of all Forest aviation operations, equipment, aircraft, and facilities.
   i. Inspect aviation facilities and operations to assure compliance with directives, policy, contract specifications, and Forest aviation plans.
   j. Coordinate with various aviation specialists, airport authorities, contractors, suppliers, CORs, Forest Safety Manager, etc.
   k. Determine need for additional monitoring of aviation operations.
   l. Participate in and supervise as appropriate, forest-level activities and programs involving aviation.
   m. Draft and/or review accident and incident reports.

3. FAO Qualifications

a. Interest and ability in aviation management.
b. Demonstrated ability to plan and supervise aviation operations.
c. Working knowledge of contracting.
d. General knowledge of forest and cooperative activities, programs, and procedures involving actual or potential use of aircraft.
e. Working knowledge of Forest Service, FAA, State and local aviation regulations.
f. General working knowledge of the performance, capabilities, and limitations of fixed-wing and rotor-wing aircraft.

4. FAO Training

Successful completion of the Interagency Aviation Training (IAT) modules listed for the Aviation Manager position within the first two years is required. Position requirements, ACE registration and some on-line modules may be found at https://www.iat.gov .

Successful completion of the following national, regional, and forest training courses within the first two years is recommended:

a. I-300 Intermediate ICS
b. S-270 Basic Aviation Operations
c. Interagency Aviation Training (IAT) modules for Aviation Manager
d. S-371 Helibase Manager
e. S-370 Intermediate Aviation Operations

E. Regional Office Aviation Program Managers

Regional policy is that each pilot assigned will function as an aviation program manager. Each position held in the aviation unit has its own position description (PD), and each person in these positions is defined as a program manager. These program management positions are:

1. Large Aircraft Program Manager

The Regional Large Aircraft Program Officer has oversight responsibilities for the large aircraft program, which includes air tankers, smokejumper aircraft and transport aircraft. The Large Aircraft Program Manager serves as a technical representative and reports directly to the Regional Aviation Officer. The incumbent also serves as pilot-in-command of aircraft involved in fire suppression missions and in aircraft involved in other Forest Service activities.

Program duties include: Regional coordination of forest airtanker programs and serving as a technical advisor to the Regional Contracting Officer for the National airtanker contracts and Regional retardant contracts, advising Forest Aviation Officers on Large Aircraft related issues, assisting the Regional Fixed Wing Operations Specialist, Fixed Wing Base Managers by providing training and support, and organizing and conducting airtanker base inspections. Serving as a Large Aircraft safety advisor to the Regional Aviation Safety Manager (RASM),

contributing to the Regional safety program by performing base reviews and inspections and providing liaison services between aircraft operators and National Forest personnel to reduce risks and hazards to ground and flight operations.

The Large Aircraft Program Officer maintains a non-controlled airport site review safety checklist to identify ground hazards to large aircraft prior to commencing operations. Provides airport files and updates for the forests and performs airport inspections when requested.

2. Light Aircraft Program Manager

The Regional Light Aircraft Program Manager serves as technical advisor and reports directly to the Regional Aviation Officer. The Light Aircraft Program Manager is responsible for formulation and management of programs involving light aircraft and training. The incumbent serves as pilot-in-command of aircraft involved in fire suppression missions and of aircraft in other Forest Service activities. The Light Aircraft Program Manager is responsible for inspecting and approving contract and rental (call-when-needed) light aircraft and pilots, and providing this information to the Forest Aviation Officer and Forest Contracting Officers on each National Forest in the Southwestern Region.

The Light Aircraft Program Officer also provides liaison services between light aircraft operators and the National Forests in interpretation, application and implementation of FAA and Forest Service rules and regulations pertaining to aviation operations. The Light Aircraft Program Manager must also maintain a thorough knowledge of the operating characteristic and limitations of various aircraft. This knowledge is used to provide sound advice on the feasibility and suitability of aircraft to meet USFS mission requirements, and to provide instruction to employees, aircraft operators and pilots. This training is accomplished formally, by instructing at such courses as Air Tactical Group Supervisor (S-378), Air Tanker Coordinator (S-376) and Fire Management for Line Officers, S-270 Basic Air Ops, and S-370 Intermediate Air Ops. There is also informal and ongoing training that occurs regularly through personal contacts and site visits.

The Light Aircraft Program Manager contributes to the Regional safety program by advising the RASM and the RAO of any safety problems or hazards, recommending corrective actions, and by helping to investigate incidents as directed by the RASM.

3. Helicopter Inspector Pilot

The Regional Helicopter Inspector Pilot (HIP) serves as a technical advisor and reports directly to the Regional Aviation Officer. The Regional Helicopter Inspector Pilot is responsible for approving and carding all helicopter pilots in the Southwestern Region. This is primarily done through check flights and pilot briefings during helicopter contract pre-work inspections. The Regional Helicopter Inspector Pilot also gives call-when-needed helicopter pilots approvals. These approvals and certifications include checking for such skills as rappelling, aerial ignition, seeding, long line operation off-site landing areas selection and procedures, pilot navigational techniques and emergency procedures. The Forest Service Load Calculations process must be discussed and the contract pilot must demonstrate thorough knowledge of the system. The Regional Helicopter Inspector Pilot must also maintain a thorough knowledge of helicopter model capabilities and limitations sufficient to advise and support forest helicopter requests and needs. Liaison must also be maintained between the forests and the helicopter operators under contract to the Forest Service.

The Regional Helicopter Inspector Pilot also assists the RASM and the RAO in all phases of helicopter safety, including reporting hazards and potential problems in helicopter operations and investigating helicopter incidents as directed by the RASM.

4. Helicopter Operations Specialist

The Regional Helicopter Operations Specialist (HOS) serves as a technical representative and reports directly to the Regional Aviation Officer. The Helicopter Operations Specialist must be an expert in the varied field of helicopter operations, which includes such areas as helicopter rappelling, aerial ignition, longline operations, transportation of hazardous materials and helicopter safety.

The Helicopter Operations Specialist must maintain a close working relationship with the Helicopter Inspector Pilot and operate as a team. The main focus of this position is to ensure safe and efficient helicopter operations on the national forests in the Southwestern Region. There are some collateral interagency duties, which include interagency training, and helibases inspections as requested by the cooperating agencies.

The Helicopter Operations Specialist duties include the training of all helicopter managers and helicopter specialty skill positions in the Region, setting up the exclusive use and call-when-needed contracts, as requested by the forests. This position also evaluates helicopter programs and initiates recommendations for changes required to conform to written policy. Also, ensures compliance with Forest Service manual and Interagency Helicopter Operations Guide (IHOG.)

Annually, the Helicopter Operations Specialist conducts the Interagency Helicopter Managers' Workshop and presents call-when-needed training as needed. In addition, the Helicopter Operations Specialist assists the forests in conducting other helicopter training such as Interagency Helicopter Training Guide (S-271) and Basic Air Operations (S-270). As directed by the Washington Office, the HOS maintains a list of FS Helicopter Managers in the Region.

The Helicopter Operations Specialist must visit each Forest Service Exclusive Use Helibase at least once each season to conduct a Safety/Service Visit or a formal inspection, as deemed necessary by the Regional Aviation Officer.

The Helicopter Operations Specialist contributes to the Regional aviation safety program by advising the RASM and the RAO of any safety problems or hazards associated with the helicopter program. Also, assists in investigation of helicopter incidents as directed by the RASM.

5. Fixed Wing Operations Specialist

The Regional Fixed Wing Operations Specialist (FWOS) serves as a technical representative and reports directly to the Regional Aviation Officer. The Fixed Wing Operations Specialist must be an expert in the field of fixed wing operations, which includes the areas of Airtankers/Airtanker base programs, SEATs/SEAT base programs, Light Fixed Wing Aircraft Program, Air Tactical Group Supervisor Program, and aerial recon, and fixed wing safety.

The Fixed Wing Operations Specialist must maintain a close working relationship with the Large Aircraft Program Manager, Light Aircraft Program Manager, Aircraft Maintenance Inspector, Regional Contracting Officer, and Forest Aviation Officers and work as a team. Upon request from a Forest, the FWOS will assist in setting up exclusive-use and call-when-needed contracts or BPA's for fixed wing aircraft. The most important duty is to ensure a safe and efficient fixed wing operation.

The Fixed Wing Operations Specialist duties include support to Air Tanker Base Managers and the Air Tactical Group Supervisor's with training, maintaining currency, and maintenance of bases.

Support forest and Interagency Aviation training to include S-370 Intermediate Air Operations, S-270 Basic Air Ops, S-378 Air Tactical Group Supervisor, and other aviation training as needed. Annually the Fixed Wing Operations Specialist will conduct the Interagency Airtanker Base Manager's Workshop and the Interagency Air Tactical Group Supervisor's Workshop.

The Fixed Wing Base Operations Specialist along with the Large Aircraft Program Manager will visit each Forest Service Airtanker Base at least once each season to conduct a Safety/Service visit and/or formal inspection, as deemed necessary by the Regional Aviation Officer. The FWOS will review SEAT Base Operations formally or informally upon the request of Forest/Agency's or Regional Aviation Officer.

RASM and the RAO of any safety problems or hazards associated with the Fixed Wing program.

6. Aircraft Maintenance Inspector

The Regional Aviation Maintenance Inspector (RAMI) serves as a technical representative and reports directly to the Regional Aviation Officer. The Aviation Maintenance Inspector provides aircraft airworthiness expertise to the Region and the eleven National Forests in the Southwestern Region. The Aviation Maintenance Inspector inspects all contract aircraft, except for point-to-point transportation, for airworthiness and contract compliance. The Aviation Maintenance Inspector-is authorized to return to contract availability any aircraft removed from service for mechanical deficiency after the necessary work has been performed and documented by a qualified aircraft mechanic.

The Aviation Maintenance Inspector is a highly trained, licensed Aircraft Maintenance Technician, (Airframe and Powerplant) and holds an Inspector Authorization (IA) issued by the Federal Aviation Administration. The Inspector Authorization allows the Aviation Maintenance Inspector to act for the Federal Aviation Administration Administrator in matters of aircraft worthiness. In the Southwestern Region, the Aviation Maintenance Inspector is also the WCF manager for the Region's aircraft fleet. As such, the WCF manager must work closely with the Regional Program Development and Budget Staff to ensure compliance with WCF policy.

The Aviation Maintenance Inspector is also the Contracting Officer's Representative on the aircraft maintenance contract for the WCF fleet. As the Contracting Officer's Representative, the Aviation Maintenance Inspector must work closely with the Regional Contracting Officer and the aircraft maintenance contractor to ensure contract compliance and quality repair work. The Aviation Maintenance Inspector is the primary contact for all aircraft repairs and inspections that may affect airworthiness.

The Aviation Maintenance Inspector contributes to the aviation safety program by advising the RASM and the RAO of any problems or hazards pertaining to aircraft maintenance issues. Also, investigates incidents as directed by the RASM.

7. Aviation Management Specialist

The Aviation Management Specialist (AMS) serves as a technical advisor and reports directly to the Regional Aviation Safety Manager. The Aviation Management Specialist provides technical and administrative support to the Region's aviation program.

The Aviation Management Specialist works with the Helicopter Operations Specialist, the Aviation Maintenance Inspector, and the Fixed-Wing Operations Specialist on projects, training,

and data analysis. The Aviation Management Specialist also works with the Aviation Safety and Training Manager in maintaining the SAFECOM system, investigating accidents and incidents with potential, and promoting the Regional safety program.

8. Special Projects Program Manager

The Special Projects Program Manager serves as technical advisor and reports directly to the Regional Aviation Officer. The Special Projects Program Manager is responsible for coordinating, scheduling and managing all special projects that pertain to aviation. Some of these projects are aerial reconnaissance of insect infested areas, law enforcement, animal counts, infrared sensing, videography and remote sensing flights.

The Special Projects Program Manager contributes to the Regional safety program by advising the RASM and the RAO of any safety problems or hazards associated with Special Aviation Projects. Also, by investigating incidents as directed by the RASM.

VI. PERSONNEL MANAGEMENT

1. Recruitment

A. Desired Workforce

The workforce within the Regional aviation program must be highly trained, skilled, and competent in the performance of assigned tasks. Employees must be receptive to new ideas and ways of doing assigned tasks. They must always be aware of the inherent danger of the task and be safety-conscious. It is the responsibility of management to assure that these principles are met.

B. Multicultural Diversity Objectives

The workforce within the Regional aviation program should reflect the national distribution of diversity of persons within the related fields of aviation. Efforts will be made to encourage experienced, knowledgeable, and competent people of ethnical, cultural, or sexual diversity to become members of the aviation program.

C. Prohibition Against Discrimination

The Regional aviation organization shall not deny employment, continued employment, or career advancement in any way contrary to any federal law or mandate. The Regional aviation organization will not tolerate or support any interference of anyone’s performance or career for reasons of any discriminatory act, such as bias or harassment, racial or otherwise.

2. Qualifications, Standards, and Certification

A. Forest Service Pilots

Agency pilots are required to meet the qualifications and training requirements as defined in FSM 5709.16, Flight Operations Handbook. It is the responsibility of management to provide the opportunity and capability for agency pilots to maintain currency and training requirements.

B. Cooperator Pilots

Requirements are covered in FSM 5700 and FSH 5709.16. Cooperator pilots flying Forest Service aircraft shall meet the same requirements as Forest Service employee pilots, as stated in FSH 5709.16, Chapter 20.

C. Military Pilots

Requirements are stated in FSM 5700, and the Interagency Military Use Handbook. An appropriate national or regional-issued Memorandum of Understanding (MOU) or similar agreement must cover the use of military pilots.

D. Contract Pilots

Requirements are covered in FSM 5700, FSH 5709.16, and a contract or rental agreement. These pilots shall be approved by agency pilot inspectors to perform those tasks required under the contract for which they are employed.

3. Employee Training and Development

It is management's responsibility to provide training and career development opportunities to personnel under its control, to expand, improve, correct deficiencies, or meet job performance requirements. It also incumbent upon management to provide opportunities for employee development and growth within the confines of the organization, both Nationally and Regionally. These principles must be applied without bias or prejudice.

It is every employee's responsibility to take advantage of offered aviation training opportunities and to notify their supervisor of any aviation training they believe they require to accomplish their jobs safely and efficiently. The Interagency Aviation Training website is a resource employees can utilize for training opportunities. On-line modules and requirements by position description are two items that can be found at: https://www.iat.gov.

VII. AVIATION MANAGEMENT ACTIVITIES

1. Overall Direction and Guidance

The direction and guidance for the Regional aviation program can be found in FSM 5700, its associated handbooks, and regional supplements. Further guidance for the aviation program comes from requests from the field and from user groups such as Forest Fire Management Officers (FMO's) and project managers.

2. Pilot and Aircraft Inspection

Found in FSM 5700 and FSH 5709.16. Inspections of pilots and aircraft by regional aviation inspectors shall be conducted in accordance with National policy and direction.

A. Inspection and Approving by Region

For all aircraft operators under contract to the Region, the Regional Contracting Officer may request that the Regional Aviation Unit inspect and approve the aircraft, pilots, and support equipment.

3. National Fire Resources and Activities

A. Purpose and Management of National Resources

Regions have certain aviation fire resources assigned to them for certain periods of the year, normally during the Region's fire season. These resources are under national contract but are assigned to the Region for management and control.

B. Leadplanes

Leadplanes are national fire resources that are permanently assigned to a region for management and staffing. These aircraft and pilots are considered National resources, and fire use is considered their primary duty. Leadplanes and their crews are available for other duties when not assigned to fire activities.

C. Multi-engine Airtankers and MAFFS

Multi-engine airtankers are contracted by the Washington Office (WO) and positioned throughout the country on assignment by National Interagency Coordination Center (NICC). "MAFFS" is an acronym for Modular Airborne Fire Fighting System and was designed for use in military C-130 aircraft. This system is capable of delivering to the fire 3000 gallons of retardant. MAFFS aircraft will be ordered and used in accordance with National policy.

D. SEAT (Single Engine Airtanker)

Single Engine Airtankers are contracted by the Aviation Management Directorate (AMD) and assigned to designated Interagency Seat Bases. The AMD also has CWN contracts to add more aircraft as needed. For more information see Southwestern Region SEAT Operations Plan or the Interagency Single Engine Airtanker Operations Guide.

E. Smokejumper/Cargo Aircraft and Programs

The Region usually details in a group of smokejumpers from other regions during the fire season. They are normally based on the Gila NF and managed by that forest. All Smokejumper operations shall be conducted in accordance with FS policy and direction.

F. Infrared (IR) Detection and Mapping

This program operates out of NFIC in Boise, Idaho. Services are available through the dispatch system.

G. Large Transport Aircraft

These aircraft are contracted nationally and are available through the dispatch system.

H. Type I and Type II Helicopters

These aircraft are contracted under a national contract; however, as with the airtankers, they may be assigned to the Region as a fire and project helicopter.

4. Regional Aviation Resources and Activities

The Region utilizes a wide range of light fixed wing and Type III helicopters to accomplish work in support of National Forest land management activities. The majority of these aircraft and pilots are acquired through contracts and rental agreements at the regional and forest level.

Following is a list of most of the types of aircraft utilized, and operations conducted, in the Region. This is not an all-inclusive list.

A. Type III Helicopter Operations

1. Initial Attack Helitack/Rappel
2. Reconnaissance
3. Aerial Ignition
4. Aerial Application
5. Cargo
6. Remote Sensing
7. Law Enforcement
8. Administrative Transport
9. Air-Attack

B. Light Fixed Wing Aircraft Operations.

1. Reconnaissance
2. Law Enforcement
3. Remote Sensing
4. Administrative Transport
5. Air-Attack

C. Airtankers Operations

1. Heavy Airtankers
2. Single Engine Airtankers
3. Heli-Tankers

D. Smokejumper Operations

VIII. REGIONAL AVIATION SAFETY AND ACCIDENT PREVENTION PLAN

1. INTRODUCTION

This Aviation Accident Prevention Plan was developed to supplement the National Aviation Management Plan and to present useful information on procedures and practices adopted by Southwest Region management. These procedures and practices are meant to prevent aviation accidents from occurring and to support the Forest Service (FS) institutional concern for safety. The FS considers it essential to safeguard against human injury, property loss, and damage to the environment.

This plan presents a general description of the elements and activities considered critical to aviation accident prevention. Although each specific activity is deemed essential, it is the dynamics of all prevention and training activities that collectively form the foundation of the Aviation Safety Program required by FSM 5703 and 5720 and make that program successful.

Each forest is to supplement this plan with forest level Aviation Plans containing more specific details relating to aviation operation conducted on or for the forest.

2. **Goal**

The goal of the Aviation Safety and Training Program is to eliminate aviation accident occurrences.

3. **Objectives**

The objectives of the safety program are:

a. To minimize human exposure to hazards through implementation of effective risk management techniques.
b. To minimize loss of life, suffering from injury or permanent impairment, and the anguish and suffering of family and friends.
c. To minimize the government costs that result from accidents.

4. **Aviation Safety Management Objectives**

a. Ensure that all aviation policies and operating procedures in the manual, handbooks, and operations guides are understood and followed.
b. Treat all non-compliance of these policies and operating procedures as unsafe behavior.
c. Hold all employees and contractors accountable for "Unsafe Behavior" whether anyone gets hurt or not.
d. Accept all non-compliance of policies and operating procedures as an attempt to hurt someone, not as a shortcut to getting the job done.
e. Instill in each employee and contractor their own responsibility for their own safety and the need for them to "Don't Bet Your Life" to get the job done.
f. Instill in each employee the need to get the job done safely.
g. These goals and objectives are being emphasized at aviation training sessions, meetings, workshops, site visits, and through one-on-one contacts within this Region. However, we still have a long way to go to get most employees and some managers to change their attitudes to accept these goals and objectives as part of their every-day activities.

5. **Management Philosophy**

A. Safety Awareness

Safety awareness is a mental attitude fostered by proper management and supervisory procedures. FS management must be a partner in aviation safety to ensure that the standards and procedures established are understood and adhered to. It means that where operational decisions must be made, they are made prudently, with safety given priority over mission accomplishment. This requires individuals to know how to do a job or mission properly, applicable FS policies, approved operating procedures, and how to follow them consistently. With a good safety awareness attitude and well-trained individuals, most aviation accidents can be prevented.

Aviation safety cannot be legislated or mandated; it can only be successfully accomplished by fostering and inspiring an attitude in which conducting aviation operations safely is the foremost priority. An undeviating and persistent commitment to professional conduct by everyone involved in the aviation program is paramount to achieving safety awareness accident prevention and successful risk management.

All people involved in the aviation program play a key role in the successful (safe) outcome of aviation activities; however, management is responsible for achieving safety goals. This can only be accomplished through awareness and uncompromising support by management.

B. Standard of Safety

Through the experience of many years of Forest Service aviation use, which began in 1919, management has established a level of operational safety (in balance with functional effectiveness and cost efficiency) for aviation activities. This "standard of safety" generally parallels those industry standards of safety established for comparable activities in commercial aviation. Methods and/or requirements used by the Forest Service to achieve this standard of safety are contained in published manuals, handbooks, guides, contracts, and operations plans. Each of these documents is an integral component of the Forest Service aviation accident prevention activities.

C. Risk Management and Systems Safety

SYSTEMS SAFETY is a methodology utilized by the Federal Aviation Administration and most of the major US air carriers. Systems safety uses risk management techniques to address a "total program" approach to aviation operations. Systems Safety is the application of special technical and managerial skills in a systematic, forward looking manner to identify and control hazards throughout the life cycle of a project, program, or activity.

A "System" is made up of all the people, procedures, equipment, facilities, materials, tools, and software involved in a project, program or activity. Using risk management techniques to address the interrelation of and between all of these, in a systematic way is the core of systems safety. The following attachments to this plan provide additional explanation and some tools that should be utilized by aviation users and managers:

- Systems Safety Guidelines (Appendix E)
- Risk Management Worksheet (Appendix F)
- Operational Risk Management (ORM) (Appendix G)

RISK MANAGEMENT is a technique of applying order to an intuitive human decision-making process. The decision is how to do something considering hazards, exposure to those hazards, and probability of a specific hazard contributing to an accident.

Risk = Hazards X Exposure X Probability

Hazards are the causes of damage and injury. Human error is the most difficult hazard to predict and in the past has been the cause of 80% of all aviation accident placed against a hazard.

Probability is the likelihood that considering the hazard and exposure, an accident is likely to occur. It is important to note that similar missions accomplished without accident or incident does not mean that you have a no-risk mission. Studies have shown that, **on average, an unsafe act can be repeated about 300 times before an accident occurs**. This is an average of extremely high risks and very low risks activities. This means that you cannot bank on getting away with an unsafe act by betting on the odds, because you don't know if the accident will occur on the first, 50th, or 301st time.

The process of managing risks makes operations safer without compromising the mission accomplishment with an accident. The purpose of managing risks is to preserve human and material resources by identifying and preventing events that cause damage and injury to those resources. Four Three rules guide the risk management process.

1. Accept no unnecessary risk.

2. Make risk decisions at the proper level.

3. Accept risks only if benefits outweigh the potential safety costs.

Successful outcomes can be achieved by applying the following steps of risk management to each flight or aviation mission:

Identify risks. Identify specific risks associated with all specified and implied tasks. Determine the hazards, exposures, and probabilities causing these risks.

Assess risks. Determine the magnitude of each risk.

Make decisions. Make risk acceptance decisions by balancing risk benefits against risk magnitude, and eliminate unnecessary risks. These decisions should include the appropriate level of Forest Service management whenever possible. Sometimes the only decision to be made is to cancel the mission. More often the benefits justify the mission, but only if the risks can be minimized by controls over how and by whom the mission is conducted. This also helps to reduce the potential costs of an accident to an acceptable level.

Identify controls. Appropriate controls may be in the areas of individual qualifications, performance of the aircraft, aircraft equipment, weather conditions, operating procedures, ground support equipment and people, personal protective equipment, communications and others. Appropriate controls reduce the magnitude of mission-essential risks through proper application of established and identified controls.

Implement controls. Integrate specific controls into aviation plans and mission performance. Knowledge and understanding of controls down through the organization to each individual involved in aviation use is essential to the successful and safe outcome of each mission. This means following established agency policies and procedures in Forest Service Manuals, Handbooks, and Guides. It means using trained personnel and following all contract specifications. Exposure is the frequency of occurrence and the number of people or aircraft.

Monitor operations. Review mission performance, suitability of controls, adherence to controls, and mission progress. Take prompt and appropriate corrective actions.

The moving force driving aviation safety and training efforts is safety through prevention. Applied risk management is a key component in successful accident prevention.

D. Identifying Hazards

Steps must be taken to detect and accurately identify those hazards that increase the risk in accomplishing Forest Service aviation missions. Hazard identification is most effectively approached as a team effort, as many hazards that exist in both ground and flight operations may not be readily detectable. The diverse perspectives held by all individuals (pilots, mechanics, managers, foremen, crewpersons, etc.) associated with aviation operations can greatly enhance accurate hazard identification.

Hazard identification is accomplished through a sequence of prescribed actions that are similar, whether taken before or after accident occurrence. Actions taken prior to an accident are proactive measures and are intended to prevent occurrence. Actions taken after an accident are reactive measures and are intended to prevent recurrence. These actions may be termed hazard detection and hazard correction. Although both hazard detection and correction are integral components of our prevention efforts, the greatest benefit is gained through proactive prevention efforts. Therefore, our major thrust is to promote and implement proactive measures for the purpose of preventing mishap occurrence.

E. Human Factors

Human error is the single area, which if possible to eliminate or reduce, would pay the greatest dividends in accident prevention since it touches every operation. Human behavior is so complex that it is unrealistic to think that human error can be eliminated. Realistic training and experience are the most effective methods of minimizing human error accidents as much as can be expected. When a person reacts to a rapid emergency situation, they almost always rely on trained reactions or past experiences and do not have time to stop to think of the individual corrective actions or analyze risks.

Human factors such as desire to accomplish the mission, peer pressure, insecurity, task overload, fatigue, distractions, management pressure, and many other reasons contribute to imprudent judgments and poor reactions that result in human error accidents.

Management or supervisory errors that directly or indirectly exert pressure on individuals to act against their judgment, stretch or ignore policy and standard operating procedures, or complete the mission regardless of risk is another form of human error that causes many accidents.

6. Operations

A. Organization for Accident Prevention

The fundamental reason for establishing the majority of Forest Service aviation positions in the past was for administration of aviation safety within the Forest Service. All personnel with aviation responsibilities are expected to actively participate in the execution of a successful aviation safety program.

The Region has designed a professional aviation organization and requires the forests to design a forest aviation organization to emphasize safety awareness. The Regional organization is staffed with technical and managerial specialists in various aviation fields that operate in their respective areas to provide continuous observations, implement accident prevention measures, monitor compliance with established procedures, and advocate a cooperative safety-oriented attitude in the execution of aviation operations. Accident prevention activities include all segments of aviation and must be closely affiliated with other Forest Service functions.

B. Flight Operations

There is considerable risk involved with flying aircraft in the Forest Service, due to the typical mission profile (e.g., low altitude, mountainous terrain, poor visibility, turbulence, and traffic congestion in confined airspace). This formidable environment is more demanding of pilot skills, reduces the allowable margin of pilot error, and limits the options and time to make good decisions for a safe outcome. While the quality and operational limitations of the aircraft play an important role in reducing the level of risk, statistics indicate that the human element is the leading factor in aviation accidents. It is, therefore, imperative to have a means to develop and promote safe attitudes for those people involved in flight operations. In addition, contract and management controls must be in place to assure that contract and employee pilots are fully qualified, proficient and current for the mission being performed.

The pilots play a primary role in achieving safety, and they must approach job accomplishment in a professional manner and use good judgment if the outcomes are to be successful. Proficiency training is regarded by management as a productive means to accomplish this, a concentrated effort must be placed on the human factor aspect of pilot performance. Human factor information allows the pilots to better interface with the machinery and environment in which they operate. Therefore, human factor training must be identified as a significant aspect of the accident prevention plan.

Aviation safety is best met by using a standardized approach. The Forest Service has, through many years of operating experience, developed national requirements that set organizational limitations for flight operations. Details of adopted national requirements are found in the various aviation manuals, handbooks, and guides. The purposes of the national requirements are to reduce exposure to hazards and manage risk through management controls. This approach emphasizes the importance of management interest, support, and involvement in nurturing successful outcomes in flight operations.

1. **Policy:**

a. Each flight will be planned and executed in a safe manner. Safety considerations will take precedence over costs or mission accomplishment.
b. Each forest will have an aviation plan and aviation project plans.
c. Aviation safety objectives will be accomplished by adherence to Forest Service Manual, Handbooks, Guides, operating plans, contracts, and applicable Federal Aviation Regulations.
d. Aircrew proficiency, currency, training, and standardization will receive high priority in an effort to prevent pilot error accidents.

C. Ground Operations

Ground operations include those activities that are both directly and indirectly related to the support of an aircraft and mission accomplishment. Ground activities that are undertaken haphazardly have the potential of being root causes to catastrophic accidents. Accidents that occur in flight operations frequently have causal factors that are directly attributable to ground activities. Therefore, ground activities are critical to assuring safe outcomes in flight operations. The Forest Service management has acknowledged the significance of hazard identification and development of standard aviation ground operations. Details of adopted national requirements are found in various Forest Service aviation manuals, handbooks, and guides. The requirements are used as controls in the development of operational procedures.

1. **Policy**

a. Aviation objectives will be achieved by adherence to Forest Service Manual, Handbooks, Guides, and operating procedures.
b. Ground crew assigned to support aviation either directly or indirectly will be properly trained for the specific assignment.

D. Security

Aviation Base Security Plans need to be updated annually. FSH 5109.16 Chapter 50 and USDA Integrated Physical Security Standard and Procedures Guide should be referenced in developing and maintaining base security plans. Security planning will include addressing facility response to HSAS levels, and a facility risk assessment. The risk assessment shall utilize the checklist found in the USDA Guide located at the following link:
http://fsweb.wo.fs.fed.us/eng/documents/phys_sec.pdf the risk assessment need not be made public, but should be kept current and on file at the facility for reference on a need to know basis.

Approved Aviation Base Security Plans shall address actions including training, incident response and notifications that all base personnel, Agency or Vendor, shall adhere to while operating from that base. It is the responsibility of all aviation personnel to be focused on aircraft and base security, as well as safety.

7. Reactive Accident Prevention

A. Investigations of Accidents

The primary purpose of aircraft accident and incident investigations is the prevention of future reoccurrences. Investigations are conducted to identify and determine causal factors. Reactive hazard detection is accomplished through the identification of the cause(s) of accidents and then taking corrective action to prevent their reoccurrence. Factors that could have a system-wide adverse effect of the safety of personnel, whether or not they contributed to the accident, are identified in the investigation.

Forest Service investigations are to be conducted by professional aviation investigators to the greatest extent possible. Experience has shown that investigations performed by experienced professional investigators reveal more about what is causing accidents. In addition to determining causal factors, investigators are to coordinate efforts with management professionals to disclose managerial concerns and determine management contributors related to the occurrence. Data obtained from investigations are entered into the National Trend Monitoring Information Base and are to be used as a source of institutional memory.

B. Hazard Correction

The causes of most accidents reveal failures to observe controls already established through previous risk management efforts and accident experiences. In addition, some accident causal factors reveal hazards not previously addressed adequately. It is imperative that these hazards or hazardous practices be corrected or they are sure to be repeated over and over again.

8. Proactive Accident Prevention

A. Hazard Detection and Incident Reporting

An aviation hazard/incident is any event or situation associated with the operation of an aircraft that, if not corrected, could result in an accident. The individual or organization with first-hand knowledge of the circumstances pertinent to the hazard/incident accomplishes the most efficient and direct detection of hazards/incidents.

Each individual and each organizational unit has an obligation to others in aviation to share hazard, mishap, and causal information. Each unit's aviation plan contains provisions for encouraging the reporting of such information by individuals. The information is documented and processed for system-wide distribution using the SAFECOM (Form 5700-14) process.

B. Reporting Procedures.

1. The individual involved or with first-hand knowledge of a hazard/incident should complete a SAFECOM form and submit it to the Regional Aviation Safety Manager (RASM) as soon as possible. The preferred and easiest method for doing this is by completing and submitting the SAFECOM through the Internet, although any method of getting the information into the system is acceptable. The Internet site is at **www.safecom.gov.**
2. The SAFECOM system automatically assigns a tracking number to each SAFECOM entered into the database.
3. The system simultaneously sends a message to the RASM and to the Forest Aviation Officer of the unit with operational control of the aircraft stating that a SAFECOM has been submitted.
4. The RASM coordinates any follow-up required, and posts the SAFECOM on the "public access" side of the SAFECOM database on the Internet.
5. Each aviation base should post the reports in an accessible location for all interested persons to see.

C. Corrective Action.

Actions to correct hazards/incidents are essentially the same, whether identified and reported before or after an accident. The normal accomplishment of remedial action is a function of management personnel. Aviation safety programs should contain provisions for recommending specific remedial action to be taken by the organization and its employees to correct hazards/incidents.

D. Monitoring Corrective Action.

The persistent monitoring of corrective actions has proven necessary to ensure that hazards are not left uncorrected and threaten future aviation activities with damage and/or injury. Regional and Forest Aviation Staffs are responsible for monitoring corrective action.

E. Trend Monitoring

The identification of prevailing events serves to indicate areas of risk so that appropriate action may be taken accordingly. Trends develop when singular events reoccur at a rate that a general direction or tendency may be detected. Trends that develop are more apparent when the frequency is high and the events are recent; however, events that occur over an extended period of time also develop trends that, if corrected, can reduce operational risk. In view of the fact that the specific aspects of Forest Service aviation activities are generally similar, system-wide events that occur locally should be monitored for local trend development and also forwarded on Form 5700-14 for inclusion in the data that are analyzed system-wide. Careful attention to hazards and causal factors that compromise flight safety can reduce our operations risk by a significant amount. The use of the 5700-14 information for trend monitoring is another key component in successful accident prevention.

F. Operating Plans

It is imperative that all aviation operations be planned with necessary consideration given to safety goals that meet or exceed aviation safety standards established by the Forest Service. Considerable forethought must be given to managing the risks and minimizing the hazards associated with Forest Service missions. Each unit's or project's operating plan is to be used to set procedures and generally state how aviation resources are to be utilized. Many factors are involved and each location has different needs. Plans must be continually reviewed and updated, as aviation operations are dynamic and continually evolve through operational experience. The next higher level in the organization approves each operating plan. Both ground and air operations personnel must review the approved operating plan prior to beginning the planned mission.

G. Training

Training is clearly one of the most important factors in safe and successful aviation operations. It is essential that, in addition to aircraft pilots (both contract and employee), aviation users, supervisors, and managers be knowledgeable of the inherent hazards of aviation operations. Forest Service management is dedicated to conducting or providing for professional and technical training of employee or contract personnel in all levels of the organization that use and/or influence the use of aviation resources. Each operating unit develops and implements plans for the identification of initial and recurrent aviation training needs specific to its missions. Areas of aviation training are:

1. Orientation and basic aviation safety for all users
2. Flight Manager Training
3. Dispatching and flight-following procedures
4. Management of aviation operations and equipment
5. Planning and execution of projects using aviation resources
6. Proficiency and special mission training for pilots
7. Technical maintenance training on aviation equipment
8. Advanced safety practices for aviation professionals and specialists

The web based Interagency Aviation Training (IAT) program is available to all aviation users and managers. Information about and access to IAT can be found at: https://www.iat.gov.

H. Standard Contract Specifications

Contractors provide approximately ninety percent of all Forest Service aviation services. Therefore, National standard contract specifications have been developed for the technical aspects of administering contractor-furnished aviation services. The standard contract specifications are minimum safety and performance requirements for mission-specific equipment and operations. The Contracting Officer (CO) is the legal authority for administration of the contract. Every employee using or managing contractor-furnished aviation services is required to immediately notify the CO when a contractor or a contractor's employee engages in unsafe acts or violates a requirement of the contract; the Regional aviation staff should also be notified and the occurrence reported on Form 5700-14.

I. Inspections and Approvals

The Forest Service has adopted requirements and developed inspection procedures for Forest Service aviation inspectors to verify and evaluate contractors and cooperator-provided flight crews, aircraft, and certain required equipment. The requirements, which are the foundation of the approval system, have evolved through operational experience and are the minimally acceptable criterion for providing an adequate standard of safety while conducting Forest Service missions. The inspection procedures are intended to provide the pilot inspectors with a means of determining the flight crew's qualifications, level of proficiency, and application of accident prevention measures. In addition, the procedures also provide equipment inspectors with a means of determining the condition of the aircraft, required equipment, and the level of compliance with an approved maintenance program. Each employee that uses or causes the use of contractors and cooperator-furnished aircraft is required to determine that the pilots and aircraft have been approved for the specific Forest Service mission.

J. Safety Evaluations

Safety evaluations are a means of determining compliance with safety standards and to detect unsafe conditions prior to experiencing an incident, accident, loss of life, personal injury, or property damage.

Formal evaluations are accomplished using a team of Forest Service, interagency, and/or industry aviation and management officials to conduct surveys, audits, and reviews. The evaluation team is responsible for providing the operating unit and its managing organization with a written report of its findings and recommendations. The managing organization of the operating unit is then responsible for developing and implementing an action plan that addresses the findings and recommendations contained in the report. These evaluations should be conducted annually at each established aviation base.

Informal evaluations are conducted on a more frequent basis and are performed by aviation specialists during field assistance visits to Forests, aviation bases, incident bases, and projects. In all cases, follow-up includes all subsequent activity needed to see that corrective actions are taken.

K. Lessons Learned

From these accidents we have learned that human behavior (failures) have increased and are now a causal factor in over 80% of all aviation accidents. The human element is now the weakest link in aviation safety.

The steady improvement of the industry products and the improved reliability of helicopters as well as airplanes reduced the occurrence of mechanical failures. Many current aircraft have more power, better turbine engines, and improved agency contract requirements. All of these factors have aided in the overall reduction of aircraft accidents.

Appendix A

Forest Aviation Plan Checklist

January 2009

- Review and Approval sign-off and date (cover sheet)
  - Prepared by
  - Reviewed by (FAO, FMO, RAO, and RASM)
  - Approved by Forest Supervisor (line officer).
- Forest Aviation Organization identified: FAO, Center Manager/Aircraft Dispatcher, Helibase and fixed wing base managers, etc.
- Description of forest area and known flight hazards.
  - MTR's, MOA's, aerial hazards, "watch out" areas, etc.
  - Does forest have a GIS layer (aviation flight hazards)?
- Process for ordering flights: (Fixed wing and Helicopter)
  - Administrative
  - Non-fire "mission" flights.
  - Fire Mgt. Mission flights (Helicopter, Airtanker, ATGS, Detection, etc.)
  - Who has **authority** to order flights?
  - What information is required when ordering flights?
  - How is the FAO notified of flights occurring on the unit?
- Who can be on mission flights?
  - Process for assigning Flight Manager (list of approved COP's on forest).
- Forest Level Aviation Training
  - Training plan for Flight Manager (who will conduct it, when, etc.)
  - Other Forest level aviation training: Helicopter crewperson, Aerial observer, Airtanker Base, etc. (Who, When, Where)
- Flight Following:
  - How is it accomplished? (Dispatch office, District Office, On Scene, etc.)
  - What are the forest requirements (15 min. check-ins, AFF, etc.).
  - List of frequencies, tones, and repeaters. (Physical location of mtn. Top sites).
  - What to do if communication is lost during flight.
  - Requirement for Flight Manager and/or pilot to provide dispatch (or whoever is flight following) with route of flight information.
- Forest Aviation Accident Prevention Program Description.
- PPE requirements for all types of flights.
- Cooperator flights: FS passengers on cooperator A/C, how will these be handled?
- Interagency Cooperators (BLM, NPS, BIA, FWS).
  - Process identified for ordering/approving/flight following, etc.
  - If Forest/Zone dispatch office provides service to other agencies, what plan are they operating under? (the forest plan, the other agency's aviation plan, a joint plan) and are copies available in the dispatch office.

- Narrative on how “routine” missions will be conducted:
  - Recon flights (fixed and rotor wing)
  - Forest Health flights
  - Photo flights.
  - Helicopter operations.
  - Others that occur on a regular basis on the forest.
- Special project aviation plans.
  - Copy of a sample plan.
  - Process identified on who completes it, who reviews it, and who APPROVES it.
- Aircraft and pilot approval process (in compliance with FS Policy).
- Appendixes:
  - Local aircraft vendor list (Approved pilots and aircraft, contract numbers, rates, contact numbers, etc.)
  - Forest aviation base’s operating plans (Helibases, Airtanker bases, etc.)
  - Forest Accident/Incident Response Guide.
  - Forest specific Direction (letters, FSM/FSH forest direction, etc.)

PROJECT
AIR OPERATIONS PLAN
SOUTHWEST REGION

Prepared by:_____Date:_____
Project Manager

Reviewed by:_____Date:_____
Project Air Officer

Reviewed by:_____Date:_____
Forest Aviation Officer

Reviewed by:_____Date:_____
Regional Aviation Officer

Reviewed by:_____Date:_____
Regional Aviation Safety Manager

Approved by: _____Date:_____
Line Officer (Forest Supervisor or District Ranger)

NOTE: Reviewers must sign prior to Approving Officials.

AIR OPERATIONS PLAN

1. Project Description and Objectives

Brief description of the project and its objectives

2. General location.

Enter the descriptive location.

3. Dates of project

These may be approximate, since exact dates of flight may not be known.

4. Aircraft Justification

Indicate why the project will require the use of aircraft in special-use flight conditions/environments and list the most practical alternatives for completion of the project.

5. Personnel and Aircraft

**Supervision*. Identify qualified Project Aviation Manager. Also identify other supervisory personnel such as, Helicopter Manager, Flight Manager as applicable.

**Participants.* List individuals involved in flights, their qualifications, and project duties.

**Aircraft*. If known, identify aircraft company anticipated to be used, registration number, aircraft type, date of aircraft data card expiration and missions for which aircraft is approved.

**Pilot*. If known, identify pilot, type of aircraft qualified in, type of missions qualified for and pilot card expiration date.

If participants are not identified yet, plan should specify that once identified that information will be passed on to FAO, dispatch etc.

6. Communications

Flight following procedures:

Frequencies for flight following.
Separate frequencies for communications with multiple aircraft and/or ground crews.
Check in procedures.

Emergency procedures:

Who is responsible for initiating Accident/Incident Response Plan?
Specify aviation base personnel responsibilities and duties concerning search and rescue..

7. Aircraft Fueling Plan
Specify where fueling will occur and who has what responsibility.

8. Material or Personnel Transported

Identify all personnel and materials or cargo to be transported.
Transported material unit weight totals
From To Name (ea pkg) Per unit weight (lbs)

9. Project Costs

Enter cost coding, projected flight hours and cost, projected miscellaneous expenses (overnight charges, service truck mileage, etc.) and total cost of project.

10. Aerial Hazard Identification

List all known aerial hazards, such as Military Training Route, towers and wires to enhance situational awareness.

11. Hazard Analysis

Consider risks associated with: (refer to CH. 3 of the IHOG)
Method
Medium
Man
Machine

Hazard/ Risk Identification	Risk Assessment	Control Options	Residual Risk

*Utilize the Program Risk Assessments and Worksheets found in the SMS Workbook. A Job Hazard Analysis is a start but does not complete the risk analysis process. Mitigations and controls along with documented acceptance of risk levels for the operation are needed to complete the process.

12. Protective Clothing

Identify the protective equipment and clothing necessary for the particular operation. Survival equipment (extra water, flotation devices, sleeping bags, etc.) beyond the normal PPE complement may be required.

13. Load Calculations and Weight-and-Balance

The pilot is responsible for the accurate completion of load calculations. Trained personnel shall ensure that aircraft scheduled are capable of performing the mission(s) safely and within the capabilities of the aircraft selected. The Helicopter Manager shall ensure that manifests and load calculations/weight-and-balance calculations are completed properly utilizing current and accurate data.

14. Special considerations

15. Specialized Equipment

16. Project Air Plan Safety Briefing

Discussion Items:

_____ a. Hazard Analysis (as outline in plan)

_____ b. Safety Air Ops (ground)

_____ c. Safety Air Ops (flight)

_____ d. Military Training Routes

_____ e. Flight Following

_____ f. Frequencies (VHF, FM, ground to air, Forest, etc.)

_____ g. Fueling

_____ h. Emergency Evacuation Plan

_____ i. Authorities

_____ j. Weather Considerations

_____ k. Hazard Map

_____ l. Other

Attendees Signature and Concurrence: _____

Attendees Signature and Concurrence: _____

Attendees Signature and Concurrence: _____

Appendix C

2009 SOUTHWESTERN REGION WCF AIRCRAFT

One leased aircraft will be available in the Region starting in early March.

N88XJ	King Air E-90	$550.00/HR plus fuel cost

SCHEDULE THIS AIRCRAFT THROUGH SWCC.

Appendix D

2008 R-3 AVIATION UNIT CONTACT LIST

NAME	OFFICE	HOME	CELL
TOM FRENCH LEAD 33 LIGHT AIRCRAFT	(505) 842-3357	(505) 890-7543	(505) 362-7013
Vacant HELICOPTER INSPECTOR PILOT	(505) 842-3358	(505)	(505) 362-7017
ALEX STONE HELICOPTER OPERATIONS SPECIALIST	(505) 842-3466	(505)	(505) 362-7020
ROB VAN HORN AVIATION MAINTENANCE INSPECTOR	(505) 842-3356	(505) 898-9725	(505) 362-7037
RANCE IRWIN FIXED WING OPERATIONS	(505) 842-3112	(505) 565-8733	(505) 362-7027
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JAMI ANZALONE REGIONAL AVIATION SAFETY MANAGER	(505) 842-3351	(505) 332-2341	(505) 362-7024
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System Safety Guidelines

The head of each agency shall furnish to employees places and conditions of employment that are free from recognized hazards that are causing or are likely to cause death or serious physical harm."

(Executive Order 12196, February 26, 1980)

INTRODUCTION

The concept of using a "systems safety" approach to planning projects for safe operations is a proven method expanding rapidly into organizations where risk is a common challenge to successful operations. Systems safety is the application of special technical and managerial skills in a systematic, forward-looking manner to identify and control hazards throughout the life of a project, program, or activity. Our present job hazard analysis based risk management process is the heart of a proactive systems safety program, and a critical component in planning for mission success.

Properly applied, this process insures that safety and health of employees is fully considered during the planning stages of a project of activity. The added benefit is the increased assurance for successful outcome of the projects under management. Each potential hazard is considered; and mitigating measures are established and implemented prior to beginning work on the project. Such actions will insure the operation is not exposed to hazards which could cause harm or deter success.

To be properly understood and implemented, the system safety process should be viewed as a problem-solving and decision making process. The problem is defined in terms of operational description and the hazards which may be encountered by employees. The solution is a set of actions which creates a safe work environment and establishes safe work procedures, and which is feasible and implementable given the constraints and opportunities associated with that project. By understanding our tasks, identifying risk, incorporating controls, and monitoring outcome, sound decisions can be made to continue or defer operations until conditions are acceptable.

This process provides formats for building safety into every project. Conducting and documenting risk management prior to beginning work on a project or research study has been a Forest Service requirement for over 20 years. Properly understood and implemented, system safety tools insure that work is conducted that meets our high standards. It must be noted that when this concept is not understood or properly implemented, it is often treated as a meaningless bureaucratic requirement.

The best system safety tools are those that are focused, complete, clearly documented, communicated to employees, and implemented. The purpose of this guide is to help make that happen.

APPENDICES:

- **FORM: FS-6700-7**
- **RISK MANAGEMENT WORKSHEET/RECORD**
- **OPERATIONAL RISK MANAGEMENT GUIDE**

I. GENERAL INFORMATION

PURPOSE:
The purpose of system safety is to ensure potential hazards, related to a specific project or activity, are identified, accurately assessed for risk, and managed to ensure employee safety and mission success. This is accomplished through solid decision making techniques that mitigate the associated risks to an acceptable level prior to beginning work. The job hazard analysis is an invaluable tool for managers and supervisors to use in meeting their obligation to prevent employee exposure to health and safety hazards, and monitor the effectiveness of their mitigation measures. Another tool which is more comprehensive is the risk management worksheet. Both processes are intended to be used with the accompanying Operational Risk Management Guide.

PROCESS:

There are two types of System Safety tools identified in this guide:

1. The simple Job Hazard Analysis, which identifies potential hazards and the mitigation steps that will be taken. This will be used in low risk or uncomplicated operations such as Office work, single tool operations, etc.

2. The Risk Management Worksheet which uses the 6 step Operational Risk Management process which includes hazard identification, risk assessment, identification of control measures, residual risk, control implementation/ supervision, and monitoring control effectiveness. This worksheet is helpful in making final go ahead decisions by incorporating an overall risk level for the mission as a whole. This is a more strategic worksheet, useful in planning for development of programs, projects, or other systems involving high risk operations or high complexity.

II. Job Hazard Analysis

1. The work leader and crew members must identify each potential hazard which might exist due to:
   a. the characteristics of the work site and the procedures; and/or
   b. tasks that are involved in that project; and

2. Determine what action(s) are taken to prevent exposure of employees to each hazard.

During each of these steps, the person(s) conducting the analysis should gather information from such resources as:
- his/her personal experience;
- job-site reconnaissance;
- input from employees who will be working on the project;
- people who have done similar work on other projects;
- occupational safety and health specialists;
- material safety data sheets (MSDS);
- equipment manuals
- equipment manufacturers' technical representatives;
- health and safety handbooks;
- existing health and safety plans and handbooks.

Steps 1 through 6 identify the project, location, unit, analyst, and date. Once this is complete the management process begins:

1. List all the tasks or activities that are involved in the project in block 7.

2. For each task, list the possible hazards associated with that task in block 8. Continue this for each task until the hazards associated with all the tasks are listed.

3. In block 9, list the abatement actions for each hazard. Abatement actions could include engineering or administrative controls, PPE, transferring the task, or accepting the risk as low.

When the job hazard analysis is completed and documented on form FS-6700-7, it must be reviewed and signed by the appropriate line officer. Prior to commencing the activity, it must

be shared with and signed by all of the employees who will be involved with the work

III. Risk Management Worksheet/Record

Blocks 1 through 4 provide the basic mission information with line approval provided in block 5.

1. Block 6 - List the operation or tasks that are being conducted.

2. Block 7 - Identify the hazards associated with each task, and in order of importance.

3. Block 8 - Assess each hazard by identifying a risk assessment of low, medium, or high. This risk assessment is made by evaluating the probability of the hazard contributing to an event and the severity of the event caused by that hazard.

4. Block 9 – Identify and develop measures suitable to address the hazard with the intent of moving the assessment into a lower, more acceptable level. The control measures may include engineering or administrative controls, PPE, re-assignment of the mission to a different operator, limiting exposure, etc. Accepting the risk may also be an option if it is low enough to justify the importance of the mission, however, all decisions must be made at the appropriate level of authority.

5. Block 10 – Once the control measures have been identified, identify new level of risk. When identifying residual risk, consider any risks associated with controls. If the residual risk is not acceptable, return to block I for new evaluations of controls.

6. Block 11 – Identify how and when controls will be implemented. Include the name or department responsible for implementation and supervision of the controls.

7. Block 12 – This is an evaluation section to be completed after the mission, or whenever issues arise in the mission that identify need for change in the risk management process. Issues identified in this section may require a return to Block G and a new process.

8. Block 13 – Once the operation has been evaluated for risks and mitigation measures are identified and in place, overall mission risk (the sum of all the sub systems involved in and supporting the mission) is identified and the mission is submitted for approval to the appropriate authority.

9. This document will be shared with all participants in the operation.

IV. Application:

A job hazard analysis or risk management worksheet should be conducted for each work project and activity. A common misunderstanding is that risk management only needs to be conducted for field activities or other work that is commonly considered to be hazardous. This perception fails to recognize that part of the purpose of the risk management process is to determine whether hazards exist, through careful and regular examination of the location(s) and procedures involved in the project. The assumption that some work does not have potential for hazards to exist has led to unnecessary and costly injuries such as cumulative trauma disorders, back injuries and electrical shock. If there is a project or activity which truly has no potential for employees to be exposed to hazards, then the job hazard analysis would demonstrate that is so.

V. Implementation:

Once the risk management process has been conducted, abatement actions must be implemented.
This means that corrective actions are done, and employee training is completed prior to commencement of related tasks; and it requires supervisors to inform employees of the hazards and abatement actions, which were identified during the risk management process, when employees are assigned to those tasks.

VI. Scope:

A job hazard analysis or risk management worksheet should cover any work which is done by forest employees. Employees: in this case, means all full-time and part-time employees, volunteers, special program enrollees (e.g. SCSEP, "Jobs Plus", Job Corps), and cooperators who are working directly for the Forest Service.

(Note: A job hazard analysis or risk management worksheet does not address the work of a contractor, or the contractor's employees; however, the job hazard analysis for a project/activity that involves Forest Service employees working in an area affected by contract activities, should address any hazards that such activities present for the Forest Service employees. A job hazard analysis for a project that utilizes contracted work, would address the inspection tasks of Forest Service contracting officials.)

VII. Timing:

The systems safety process must be conducted, and documented, prior to work beginning on a project. The process should be conducted during the project planning phase. This insures two important benefits of the process:

1. Employees can be apprised of the hazards and required abatement actions, prior to the potential exposure; and,
2. Needed worksite modifications, training, and/or supplies can be budgeted for and obtained in a timely manner.

Systems safety documents should be reviewed at least annually, and updated as needed to reflect changes in the work and/or worksite conditions. The best time to do this review and update is during the time that budget projections are developed. This ensures that safety costs can be included in the overall cost of the project.

VIII. COMMON QUESTIONS ABOUT RISK MANAGEMENT PROCESS

"When should systems safety be conducted?"

Systems safety is an ongoing management tool that begins at original concept and continues through project monitoring. The best time to initiate the risk management process is during the project planning stage. When done at this stage, safety-related costs (e.g. engineering, special equipment, training, and personal protective equipment) can be determined and included in the budgeting process.
In any case, the process must be completed and documented prior to beginning work on the project.

"How does the analyst determine what hazards might exist in a particular job?"

Hazards should be anticipated by the analyst, by considering each step in the work activity and anticipating what the employee(s) might encounter during the particular job that is being analyzed. The analyst should consider; 1) the work

environment; 2) materials and equipment that are used; and the work procedures themselves. Activities which support this process include:

- visiting the site where the work is to be done;
- observing similar work procedures;
- interviewing employees who have done similar work;
- reviewing accident records involving similar work;
- reviewing the Forest Service (or other agency) Health and Safety Handbook(s);
- reviewing related sections of the OSHA regulations;
- reviewing manuals and pamphlets published by safety organizations, such as;
- OSHA;
- reviewing equipment operation manuals;
- reviewing material safety data sheets (MSDS) for materials used in the job:
- consulting a safety specialist;
- reviewing job hazard analyses for similar projects.

Determination of hazards is done in steps;

1. break the project into specific tasks, or work activities;
2. for each task, consider what hazards the employee might be exposed to;
3. list each hazard in block 7, leaving sufficient room between hazards to list abatement actions in the adjacent block 8.

"Can existing documents, such as an exposure control program or a Health & Safety Code chapter, be listed in Block 9 (Abatement Actions/control measures) instead of describing specific procedures?"

Yes, standard safety procedures have been developed and documented in various plans and directives. Incorporating these in the risk management process saves time and effort, ...as long as the analyst evaluates them in the light of the specific conditions involved in the project or activity, and determines that they are appropriate. This saves time and unnecessary effort; but it should never be assumed, while conducting risk management, that all the employees will be aware of and follow existing safety protocol. Where an existing procedure adequately describes how to abate the hazard, that procedure can be referenced with a description of how the supervisor will ensure the employees are aware of the procedure, and how to implement it.

Note: Lengthy lists of detailed safety procedures can often be avoided by developing and implementing a safety orientation training program that addresses general safety concerns, such as "Field Safety in the Coast Range Forests" or "Shop Safety on the ODNRA".

"Since typing information in columns is awkward in the IBM system, can Blocks be filled out in outline form?"

Yes, after filling in the heading information the body of the form can be attached as an outline.

"**We already have a file of job hazard analyses. Can we just use one of those for a new project?"**

A job hazard analysis that was conducted for a similar project, using similar procedures, in a similar location, will provide a good reference when developing a risk management process. It must be understood that as we develop our ability to manage for safety, additional tools may need to be implemented and the old job hazard analysis may no longer meet all of our management needs. If the analyst determines that the filed analysis covers all the hazards associated with the location and procedures involved in the current project, and that the abatement actions would be effective and implementable, then that information could be incorporated into the process with modifications as needed.

While it makes good sense to incorporate information from a previous job hazard analysis, it is important that the analyst carefully consider the current situation. Such consideration should include gathering site-specific information about possible hazards; and it should include a full understanding about the work procedures which will be used.

"Is there a library of sample job hazard analyses, which can be used for reference?"

Yes, Region 1 has a library of sample job hazard analysis, which can be accessed in the IBM.

Access is quick and simple. To access these documents:

JHA's are on R1 Homepage screens. The R1 Homepage address is: **http://fsweb.r1.fs.fed.us** Click on **Health/Safety**, then click on **JHA's**. They're filed in alphabetical order with the originating Region number attached. If you are looking for a JHA for Chainsaw work, click on "c" and the listing will appear for your selection. Remember that these are samples only. The analyst must consider the adequacy and appropriateness of identified hazards and abatement actions, as they relate to the project/activity that he/she is analyzing.

There are also files of job hazard analyses on each unit. Contact your unit safety program coordinator for more information about how to find these.

"As a line officer, what should I look for when reviewing and approving a job hazard analysis or risk management worksheet?"

Since you are responsible for the safety of employees in your work force, it is important that you assure yourself that the job hazard analysis fully identifies potential hazards, and describes actions which will effectively prevent exposure of employees in a manner which could result in serious injury. Criteria which will help in making this evaluation include:

- the project of activity is clearly identified;
- the list of tasks and procedures (block 7) is complete, i.e. all tasks and procedures which are necessary to complete the project are identified;
- the list of hazards (block 8) reflects an understanding of current condition of the worksite(s), and of the work procedures;
- the abatement actions are feasible, effective, and affordable;
- the abatement actions are clearly stated in active terms;
- response to medical emergencies and (for field activities) emergency evacuations is addressed;
- training and personal protective equipment needs are identified.

"What should I do if a project is urgent, and there isn't time to conduct a risk management document?"

Take time to conduct the process. The often-heard statement that "There is no job so important that it can't be done safely.", is more than a slogan. When it comes to providing a safe work environment and safe work conditions, we can't afford to not think ahead.

No-one wants to say, during an accident investigation interview.....

"I didn't have time to make things safe."

Appendix F **RISK MANAGEMENT WORKSHEET/RECORD**

13.

1. **TASK or MISSION:**			2. **Date/Time:** **BEGIN:** **(Task or Mission)** **END:**			3. **DATE PREPARED:**
4. **PREPARED BY :**						5. **LINE OFFICER APPROVAL:**
6. TASKS	**7. IDENTIFY HAZARDS**	**8. ASSESS HAZARDS**	**9. DEVELOP CONTROL MEASURES**	**10. DETERMINE RESIDUAL RISK**	**11. IMPLEMENT CONTROLS & SUPERVISE**	**12. *EFFECTIVENESS OF CONTROL MEASURES**

Determine overall mission/task risk level after control are implemented (circle one)
LOW (L) MODERATE (M) HIGH (H) EXTREMELY HIGH (EH)

more effective control measures.

*** To be completed after exercise/task/mission and gauge the effectiveness of control measures for future reference. It will help in providing**

Appendix G

OPERATIONAL RISK MANAGEMENT (ORM)

1. **PURPOSE** - This Instruction is intended to standardize Operational Risk Management (ORM) policy, and outline procedures and responsibilities for implementation.

2**. ACTION** - Instruction is distributed to the widest extent possible and all personnel comply with its provisions.

3. **DIRECTIVES AFFECTED** - FSM 5720, FSH 5709.16, IHOG, ILOG, SEAT operations handbook, Interagency Aerial Ignition Guide, Interagency Aerial Supervision Module Operations Guide.

4. **BACKGROUND** - Human error is the leading contributing factor in mishaps that have resulted in the loss of personnel and equipment within the Land Management Agencies. Faulty risk decisions have too often placed our people at greater risk than necessary. The goal of this program is to:

Promulgate a decline in mishap rates with the ultimate goal of attaining a zero fatal accident rate.

Beyond reducing losses, risk assessment and management provides a logical process to identify and exploit opportunities producing the greatest return on our investment of time, dollars, and personnel.

RISK TERMINOLOGY: Team members need to understand ORM terms and be able to clearly communicate risk effectively in order to use the ORM process. Understandably, each Region will differ in how it interprets risk assessment and risk management results due to unique mission differences and its members' varying degrees of knowledge, skill, experience and culture. To facilitate communications between participants, the following terminology guide is presented.

Operational Risk Management (ORM): A continuous, systematic process of identifying and controlling risks in all activities according to established parameters. This process includes detecting hazards, assessing risks, and implementing and monitoring risk controls to support effective, risk-based decision-making.

Event: A situation where a hazard is encountered that changes the outcome of the operation.

Exposure: The amount of time, number of cycles, number of people involved, and/or amount of equipment involved in a given operation.

Hazard: Any real or potential condition that can contribute to or cause a mishap.

Mishap: An unplanned event, or series of events causing death, injury, occupational illness, or damage/loss of equipment or property.

Probability: The likelihood an event will occur.

Risk: The possibility or chance of personal injury, property damage or loss, determined by exposure to hazards encountered in an operation. Risk level is expressed in terms of hazard probability and severity.

Risk Assessment: The systematic process of evaluating risk levels for specific hazards, identified with a particular task or operation.

Risk Rating Scale: A scale of specific risk levels, determined by using the ORM risk assessment process. The safety industry's standard terms, "low", "medium", and "high" are used when discussing risk across program lines. Each community within Fire and Aviation, should establish rating scales in terms meaningful to its own personnel.

Severity: An event's potential consequences in terms of degree of damage, injury, or impact on a mission

Levels of Risk Management

The risk management process may need to be altered to meet constraints imposed by time, equipment, or operational needs. The following three conditions identify situations where risk management techniques may be altered:

- Time-Critical: Time-critical risk management is an "on the run" mental or verbal review of the situation using the basic risk management process without recording the information. This option is most frequently applied by ATGS and Lead Plane pilots in routine fire operations.

- Deliberate: Deliberate risk management addresses planning for operations conducted at a daily level, where there is opportunity to address hazards before commencement of the actual mission. This level may be more likely to utilize some form of documentation. Examples of deliberate applications include operations on extended attack fires; Helicopter load calculations, maintenance, or routine training evolutions, and aviation project plans.

- Strategic: This process deals with long range planning for complex missions or program development and review. Examples of strategic applications may include integrated interagency plans, introductions of new equipment, new missions, or major replacement assets.

THE CONCEPT OF RISK MANAGEMENT:

- A decision making tool
- Increases operational effectiveness by anticipating hazards and reducing the potential for loss
- Increases the probability of mission success.
- Advocates feedback from all organizational levels

PRINCIPLES: There are four basic risk management principles that should be applied before conducting any anticipated job, action or mission. These principles are relevant throughout an operation. Decision making is a continuous and on-going process as events develop.

1. **Accept No Unnecessary Risk**:
All activities contain various levels of risk.

2. **Accept Risk Only When Benefits Outweigh Costs**:

Compare all identified benefits to all potential costs. Even high-risk operations may be conducted when decision-makers clearly acknowledge the sum of the benefits exceeds the potential costs.

3. **Make Risk Decisions at the Appropriate Level**:

Anyone can make a risk decision. Decisions to allocate resources must be made at the appropriate level to reduce the risk or eliminate the hazard.

4. **Integrate risk management into mission planning, preparation, and execution**:

Operational Risk Management is equally critical in all phases of activity. Although risks can be addressed in planning, risk can change during an actual mission as new hazards are realized.

MANAGEMENT ROLES AND RESPONSIBILITIES:

RAO and RASMs, Forest/Unit Aviation Officers monitor the program to ensure that operators**:**

1) Manage risk effectively.
2) Select from risk reduction options developed.
3) Accept or reject risk based on the benefit derived.
4) Motivate operators and managers to use ORM and utilize training opportunities.

Operators and CORs**:**

1) Assess risks and implement appropriate safeguards as needed.
2) Understand risks that are acceptable.
3) Understand, accept, and implement risk management processes.
4) Maintain situational awareness of the changing risks associated with an operation and notify supervisors when appropriate.

Operational Risk Management Process (ORM) Steps

1. Identify the Hazards
2. Assess the risks
3. Analyze risk control measures
4. Make control decisions
5. Implement risk controls
6. Supervise and review

1. Identify Hazards

In Accordance with the FS Health and Safety Code Handbook (FSH 6709.11), Zero Code, pages 0-4 through 0-5, (See also Ch.70) A JHA is REQUIRED to be prepared to identify job-related-hazards, eliminate unacceptable risk and conduct a "tailgate" safety session to go over the precautions identified in the JHA. These steps still must me taken IAW our policy.

To successfully identify and analyze risk, carefully define the hazards and their potential severity or impact on the mission. It is critical that personnel with technical knowledge and operational experience in the mission are involved in this step.

Define Mission

- What does the task entail, and what is our role?

What can go wrong?

- **Personnel:** Human error is the single leading contributing factor in all mishaps. Are personnel properly trained and capable of handling the mission's demands? Are they fatigued, complacent, or suffering from physical or mental stress or possibly taking over-the-counter or prescribed medications (see AIM 8-1-1). All these factors can adversely effect human performance.

- **Equipment:** Is the equipment adequate and functioning properly and will it do so throughout the planned evolution (remember the safety triangle: cost effective, safe, RIGHT (the right tool))?

- **Environment:** How will weather, geographic influences, physical barriers, workplace climate, and available light affect the event?

2. Assess Risks

Using a risk assessment tool such as a risk assessment matrix (Figure 1), identify the level of risk. Develop and use an appropriate risk rating scale for the mission by asking:

- What is the likelihood of each hazard becoming an event? – Probability
- What are the effects if an event should occur? – Severity
- What is the operational frequency or degree of involvement? – Exposure
- Decide what is the acceptable level of risk for the mission

1. If risk is acceptable, no action is required – move to step 6.
2. If risk is unacceptable, controls must be identified and implemented – move to step 3.

Probability x Effect = Risk Assessment Code

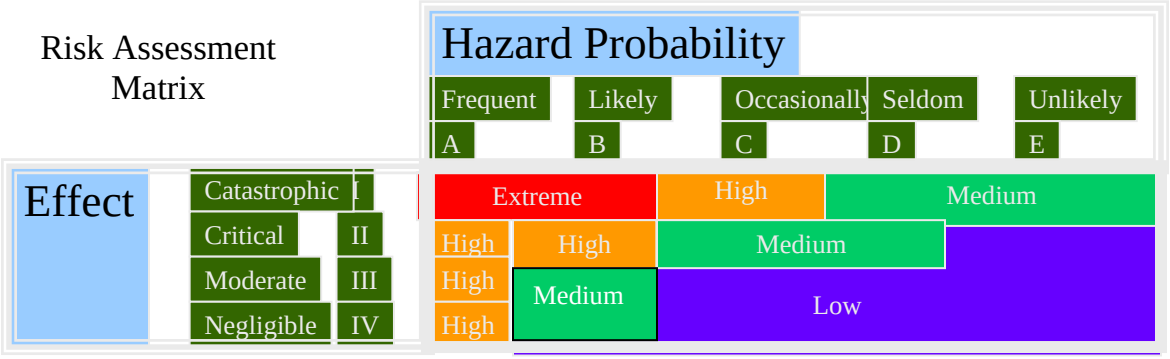

Figure 1
General Risk Assessment Matrix

3. <u>Analyze risk control measures</u>

A. <u>Consider options</u>: - Evaluate all options that could be implemented to reduce risk. General options are:

S*pread risk*
T*ransfer risk*
A*void risk*
A*ccept risk*
R*educe risk*

B. <u>Types of Risk controls:</u> - Specific risk controls may be implemented to mitigate individual or even multiple hazards. Control types are as follows:

- Engineering
(1) PPE
(2) Hardware (example: Right equipment for the job?)
(3) Airframe inspections/modifications
- Administrative
(1) Modify exposure or mission
(2) Training
(3) Warning signs
(4) Established policy

4. <u>Make control decisions</u>

The control options identified in step 3 must be evaluated, and appropriate controls selected for the operation. The controls selected for use will be based on the following criteria:

- Cost effectiveness.
- Available time to implement new controls.
- Selected controls do not create new risks.
- Decisions must be made at the appropriate level.
- Evaluate effectiveness of new controls.
- Evaluate new risk rating after all controls are in place.

When benefits outweigh risk, controls are at an acceptable level. If controls are inadequate, return to step 3

5. Implement Controls

It is important to evaluate the controls already in existence and determine if they are effective and if they will be affected by the new controls. Resource availability may delay the implementation of the new controls. Ensure that such a delay will not adversely affect the new controls. New controls may produce changes that have to be accepted, training and education may be required to properly implement controls. In every case the implementation of new controls must be briefed and all parties affected must have a clear understanding of their roles and responsibilities. As stated earlier it is important that final decisions to implement controls and conduct operations are made at the appropriate level and that knowledgeable personnel are involved in the decision.

6. **Supervise and Review**

Monitor situation:
- Ensure employees work to standards and communicate problems.
- Supervisors enforce standards and evaluate control effectiveness.
- Are mission objectives being accomplished?
- Has the situation changed?
- Check effectiveness of safeguards.
- Take action when necessary to correct ineffective risk controls
- Reinitiate the risk management steps in response to new hazards.

SUMMARY:

- It is important to remember **RISK MANAGEMENT IS A CONTINUOUS PROCESS.** Failure to respond to changes in the operation can become a link in a chain of errors that lead to a mishap. Be prepared to re-assess and begin the ORM process again. **MAINTAIN COMMUNICATION AND SITUATIONAL AWARENESS.**

Reminder:

Risk management does not convey authority to deviate from established laws and regulations without prior approval from appropriate authority.

Operations Checklist

1. Identify potential Hazards
- Simple self evaluation – IMSAFE – Illness, Medications, Stressors, Alcohol, Fatigue, Eating
- Aircraft

- Environment
- Mission

2. Assess Hazards
- Likelihood the hazards will become an event
- Severity if an event occurs

3. Analyze
- Evaluate options
- Identify Controls

4. Decide
- Proper authority level
- Which options and controls will work best
- Go – No Go decision

5. Implement Controls

6. Monitor Mission
- Report and manage new hazards
- Ensure controls and mission standards are properly followed