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**Chapter 17**
**Aviation Operations/Resources**

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**Purpose and Scope**

Aviation managers are responsible for all aircraft missions.  Policy and standards will ensure that aviation services are cost effective, minimize risk, and benefit the agency and the public.

Aviation management provides a service for the customer, whether the customer is the user of public resources or an activity within the organization.  Clear direction and good management practices can reduce risks inherent to aviation missions.

The emphasis for any aviation mission is safety, minimizing risk, planning, supervision, and evaluation.

**Organizational Responsibilities**

**Aviation Management Directorate**

The Aviation Management Directorate (AMD), of the National Business Center, is responsible for aviation policy development, aircraft acquisition, and maintenance management within the agencies of the Department of the Interior (DOI). AMD has no operational responsibility. AMD provides aviation safety program oversight, accident investigation, and aircraft and pilot card inspection.

- *BLM - National Aviation Office (NAO) - NAO develops BLM policy, procedures, standards, and maintains functional oversight and facilitates interagency coordination for all aviation activities.  The principal goals are safety and cost-effectiveness.  The NAO supports BLM activities and missions, including fire suppression, through risk management.  Refer to BLM Manual 9400 for aviation policy and guides.  (Refer to 112 DM 12 for a list of responsibilities.)*

- *FS - National Aviation Officer (NAO) is responsible to the Assistant Director of Fire and Aviation Management (Aviation) for the management and supervision of theNational Headquarters Office detached Boise Aviation Unit.  The NAO provides leadership, support and coordination for national and regional aviation programs and operations.  (Refer to FSM 5704.22 for list of responsibilities.)*

**State/Regional Office**

A State/Regional Aviation Manager (S/RAM) is located in each state/regional office.  S/RAMs implement aviation program objectives and directives to support the agency mission and state/region objectives.  Several states/regions have additional support staff, aircraft dispatchers, and/or pilots assigned to support aircraft operations and to provide technical expertise.  A state/regional aviation operations and management plan is required to outline the state/region's

aviation program objectives and to identify state/region-specific policy and procedures.

- **FS - Local Level - Unit Aviation Officers (UAOs)/Forest Aviation Officers (FAOs)** *have the responsibility for aviation activities at the local level, including aviation mission planning, safety measures, supervision, and evaluation.  UAOs/FAOs assist Line Officers with risk assessment/management and cost analysis.  (Refer to FSH 5709.16_10.42)*
- **BLM -** *Local Level - Unit Aviation Managers (UAMs) have the responsibility for aviation activities at the local level, including aviation mission planning, safety measures, supervision, and evaluation.  UAMs assist Field Office Managers with risk assessment/management and cost analysis.*
- **FS -** *Regional Aviation Officers (RAOs) are responsible for directing and managing Regional aviation programs in accordance with the National Aviation Safety Plan. (Refer to FSM 5720.47c for list of responsibilities.)*
- **NPS -** *Organizational responsibility refer to DO-60, RM-60.*

**Aviation Information Resources**

Aviation reference guides and aids for agency aviation management are listed for policy, guidance, and specific procedural requirements.

- **BLM -** *9400 Manual Appendix 1, BLM Standard Operations Procedures, National Aviation Plan. (In all cases DOI policy Department Manuals [DMs], Operational Procedural Memoranda [OPMs], and BLM policy will take precedence.)*
- **FWS -** *Service Manual 330-339, Aviation Management and IHOG.*
- **NPS -** *RM-60 Aviation Management Reference Manual and IHOG.*
- **FS -** *FSM 5700,FSM 5709.14, FSH 5709.16 and IHOG.*

In addition, safety alerts, instruction memoranda, information bulletins, incident reports, and other guidance or information are issued as needed.

An up-to-date library with aviation policy and procedural references will be maintained at all permanent aviation bases, dispatch, and aviation management offices.

**Aviation Safety**

**Risk Assessment and Risk Management**

The use of Risk Management will help to ensure a safe and successful operation. Risk is the probability that an event will occur.  Assessing risk identifies the hazard, the associated risk, and places the hazard in relationship to the mission. A decision to conduct a mission requires weighing the risk against the benefit of the mission and deciding whether the risks are acceptable.

Aviation missions always have some degree of risk.  The four sources of hazards are methods, medium, man, and machine.  Managing risk is a 5-step process:

- Identify hazards associated with all specified and implied tasks for the mission.
- Assess hazards to determine potential of occurrence and severity of consequences.
- Develop controls to mitigate or remove risk, and make decisions based on accepting the least risk for the best benefit.
- Implement controls - (1) education controls, (2) physical controls, and (3) avoidance controls.
- Supervise and evaluate - enforce standards and continuously re-evaluate their effectiveness in reducing or removing risk.  Ensure that controls are communicated, implemented, and enforced.

*THE RISK MANAGEMENT PROCESS*
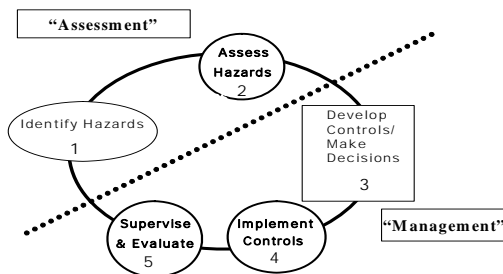


## Aviation Watch Out Situations

As part of the risk management process, each aviation manager and employee should ask the following questions to develop controls and make good decisions.

- Is this flight necessary?
- Who is in charge?
- Are all hazards identified and have you made them known?
- Should you stop the operation or flight due to change in:
  - ➢ Conditions?
  - ➢ Weather?
  - ➢ Communications?
  - ➢ Turbulence?
  - ➢ Confusion?
  - ➢ Personnel?
  - ➢ Conflicting Priorities?
- Is there a better way to do it?
- Are you driven by an overwhelming sense of urgency?
- Can you justify your actions?
- Are there other aircraft in the area?

- Do you have an escape route?
- Are any rules being broken?
- Are communications getting tense?
- Are you deviating from the assigned operation or flight?

This list is found in the *IRPG*.

**Mission Planning/Hazard Mitigation**

Pre-flight planning will reduce risks on any mission.  Flight planning and scheduling require the following points be addressed:

- Completed and signed Aircraft Flight Request/Schedule or an Incident Resource Order
- Cost analysis
- Assessment and mitigation of hazards
- Selection of aircraft
- Scheduling of pilots and aircraft
- Pre-flight briefings and post-flight debriefings

**Aviation Safety Support**

During high levels of aviation activity it is advisable to request an Aviation Safety Assistance Team (ASAT). An ASAT's purpose is to assist and review helicopter and/or fixed wing operations on ongoing wildland fires.  They should operate under a delegation of authority from the appropriate State/Regional Aviation Manager(s).  Formal written reports will be provided to the appropriate manager(s).  A team should consist of the following:

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

**Aircraft and Pilot Carding**

AMD/FS are responsible for inspecting and approving all aircraft and pilots utilized by the agencies.  State owned aircraft and state agency pilots may be approved by AMD and/or the FS.  These pilots are not required to carry a card; however, they must have in their possession an approval letter. The letter of authorization or Memorandum of Understanding is agency specific and valid only for each agency that is a signatory of it.  With the exception of a life-threatening situation, no employee will fly with unapproved pilots or in unapproved aircraft.

The unit dispatcher or UAM (NPS – fixed wing/helicopter manager) is responsible for checking and verifying pilot and aircraft cards for mission planning and procurement.  The employee is responsible for checking pilot and aircraft cards or letters of approval before the flight.

Only the agency issuing authority can suspend or revoke a card.  However, any employee can suspend operations that they consider unsafe.

**Military or National Guard Aircraft and Pilots**

The *Military Use Handbook (NFES 2175)* will be used when planning or conducting aviation operations involving regular military aircraft.  Ordering military resources is done through NICC; National Guard resources are utilized through local or state MOUs.

**Aviation Safety Briefing**

Every passenger must receive a briefing prior to each flight.  The briefing is the responsibility of the Pilot in Command (PIC) but may be conducted by the pilot, flight manager, helicopter manager, fixed-wing base manager, or an individual with the required training and experience to conduct an aviation safety briefing.  Refer to the *Incident Response Pocket Guide (IRPG) - Aviation User Checklist.*  The briefing will be specific to the mission, and will include (but is not limited to) the following:

- Pilot's card - qualified and current for aircraft type and mission?
- Aircraft card - aircraft approved for mission?
- Flight Plan/Following - filed (FAA/Agency/Bureau)?
- Personnel Protective Equipment (PPE) - required for missions - available and worn by all passengers and pilot?
- Pilot briefed on mission objectives/parameters of flight and known flight hazards?
- Pilot briefing to passengers will include:
  - Aircraft approach and departure paths
  - Seat belt - use and adjustment
  - Smoking rules
  - Fire extinguisher(s) - location and use
  - Emergency exits - location and use
  - Survival equipment - location and use
  - ELT - location and use
  - Other emergency procedures, e.g. fuel and electric shutoff
  - Radio operations
  - Equipment or tools - never store under seats while transporting passengers

**Aviation Hazard**

An aviation hazard is any condition, act, or circumstance that compromises the safety of personnel engaged in aviation operations.  All personnel are responsible for hazard identification and mitigation.  This includes pilots, flight crew personnel, aviation managers, incident air operations personnel, and passengers.  Aviation hazards include the following:

- Deviations from policy, procedures, regulations, and instructions.
- Improper hazardous materials handling and/or transport.

- Airspace conflicts/flight following deviation.
- Deviation from planned operations.
- Failure to utilize PPE or Aviation Life Support Equipment (ALSE).
- Failure to meet qualification standards or training requirements.
- Extreme environmental conditions.
- Improper ground operations.
- Improper pilot procedures.
- Fuel contamination.
- Unsafe actions by pilot, air crew, passengers, or support personnel.

Aviation hazards also exist in the form of wires, low-flying aircraft, and obstacles protruding beyond normal surface features.  Each office will post, maintain, and annually update a "known aerial hazard map" for the local geographic area where aircraft are operated, regardless of agency jurisdiction. This map will be posted and used to brief flight crews.

**SAFECOM**
The Department of Interior (DOI) and the US Forest Service (FS) have an incident/hazard reporting form called The Aviation Safety Communiqué (SAFECOM). The database www.safecom.gov  fulfills the Aviation Mishap Information System (AMIS) requirements for aviation mishap reporting for the DOI agencies and the US Forest Service. Categories of reports include incidents, hazards, maintenance, and airspace. The system uses the SAFECOM Form OAS-34 or FS-5700-14 to report any condition, observation, act, maintenance problem, or circumstance with personnel or aircraft that has the potential to cause an aviation-related mishap. The SAFECOM system is not intended for initiating punitive actions. Submitting a SAFECOM is not a substitute for "on-the-spot" correction(s) to a safety concern.  It is a tool used to identify, document, track and correct safety related issues. A SAFECOM does not replace the requirement for initiating an accident or incident report.

Any individual (including cooperators) with knowledge of an incident/hazard should complete a SAFECOM.  The SAFECOM form should be entered directly on the internet at www.safecom.gov or can be faxed to the Aviation Management Directorate, Aviation Safety @ (208)433-5069 or FS at (208) 387-5735 ATTN: SAFETY.  Electronic cc copies are automatically forwarded to the National, Regional, and State Aviation Managers.

The agency with operational control of the aircraft at the time of the hazard/incident/accident is responsible for completing the SAFECOM and submitting it through agency channels.

**Aircraft Incidents/Accidents**
Notify FS or AMD and DOI agency Aviation Safety Managers of any aircraft mishap involving damage or injury.  Use the hotline 1(888) 464-7427 or the

most expeditious means possible.  Initiate the appropriate unit Aviation Mishap
Response Plan.

**Incidents**

An aircraft incident results in very minor damage to the aircraft, which meets
less than serious criteria or injury not requiring medical attention (first-aid only).

**Accidents**

The definition for aircraft "accident" is lengthy and technical.  An investigation
team will make the determination as to the classification between an incident,
incident with potential, and an accident.  In general, if an occurrence was more
serious than those described under the definition of "incident" above, then the
occurrence should be treated as an accident.

- *BLM/FWS/NPS - Aviation accidents are investigated in accordance with
  352 Departmental Manual - Aviation Safety, and National Transportation
  Safety Board (NTSB) regulations.*
- *FS - Definitions for FS aviation mishaps are found in FSM 5720.5.
  Direction for FS related Aviation Accidents and Incidents are located in
  FSM 5723.*

**Helitack**

Helitack crews perform suppression and support operations to accomplish fire
and resource management objectives.

PPE Requirements - As referenced in the *IHOG*, Chapter 9, chart 9-2, full PPE
is required for all helicopter flights, including non-fire helicopter flights.  Full
PPE consists of an approved aviator flight helmet, aramid flight suit (or
Nomex® shirt and pants), aramid or leather gloves, and all-leather boots.

The only acceptable situation where a hard hat may be substituted for a flight
helmet is passenger transportation during fire suppression operations between an
established, managed helispot/helibase and an established, managed
helispot/helibase.

**Policy**

The *IHOG* serves as the standard for Interagency Fire Operations.
- *NPS - With the implementation of NPS RM-60 the IHOG will become
  policy for all helicopter operations in the NPS.*

**Organization**

- *BLM - The standard BLM exclusive-use helitack crew is a minimum of
  nine personnel (PFT supervisor, long-term assistant, long-term lead, and
  six temporaries).  As the need arises, each crew must be able to support
  and manage a call-when-needed (CWN) helicopter in addition to the
  exclusive-use helicopter.*

- *NPS - NPS exclusive use modules will consist of a minimum of 8 personnel.*
- *FS - Regions may establish minimum crew size and standards for their exclusive- use helitack crews.  Experience requirements for exclusive-use helicopter positions are listed in FSH 5109.17, Chapter 40.*

**Operational Procedures**

The *IHOG* specifies how helicopter operations should be conducted, whether in support of wildland fire or natural resource missions, and provides guidance for helitack and helicopter operations.

Required and recommended equipment for helitack crews and helicopters changes frequently.  Consult the *IHOG* and the contract for requirements.

- *BLM/NPS - exclusive-use contract helicopter and helitack crews are controlled and dispatched locally by the administrative unit.  At the discretion of the local Fire Management Officer, these helicopters may be made available for off unit or out of state assignment.*
- *FS - Initial attack exclusive use aircraft are contracted by each region, dispatched by the local administrative unit and may be available for off unit or out of region assignments.  National exclusive use aircraft and crews are hosted by Forest units but are ultimately dispatched by NICC.*

**Communication**

The helitack crew standard is one handheld programmable multi-channel FM radio per every 2 crew persons, and one multi-channel VHF-AM programmable radio in the primary helitack crew (chase) truck.  Each helitack crew (chase) vehicle will have a programmable VHF-FM mobile radio.  Each permanent helibase will have a permanent programmable FM radio base station.

**Transportation**

Dedicated vehicles with adequate storage and security will be provided for helitack crews.  The required GVW of the vehicle will be dependent upon helicopter type and the number of helitack crewmembers.

- *BLM - A standard BLM Helitack Support Vehicle may be ordered through the Equipment Development Unit at NIFC.*

**Safety**

A risk assessment will be made and appropriate mitigation action taken for all suppression and resource aviation missions.  For information on the risk assessment and management, see the *IHOG*, Chapter 3.

**Training and Experience Requirements**

All members will meet fire qualifications as prescribed by the NWCG 310-1 and their agency manual requirements. The following chart establishes experience

1  and training requirements for FS, BLM, NPS, and FWS Exclusive Use Fire

2  Helicopter Crew Positions.

3

| POSITION [1] | MINIMUM PREREQUISITE EXPERIENCE [2] | MINIMUM REQUIRED TRAINING [3] | CURRENCY REQUIREMENTS |
|---|---|---|---|
| Fire Helicopter Crew Supervisor | One season [4] as an Assistant Fire Helicopter Crew Supervisor ICT4 HEB2 | | RT-372 [5], IAT Modules as required by agency [6] |
| Assistant Fire Helicopter Crew Supervisor | One season as a Fire Helicopter Squad Leader ICT4 HELB or HCWN HEB2 (T) | I-200, S-200, S-215, S-230, S-234, S-260, S-270, S-290, S-371, S-372 | RT-372, IAT Modules as required by agency |
| Fire Helicopter Squad Leader | One season as a Fire Helicopter Crewmember FFT1 ICT5 | S-131, S-133, S-211, S-212, S-281 | Annual S-271 Refresher [7] |
| Fire Helicopter Crewmember | One season as a Firefighter FFT2 HECM Taskbook | I-100, S-130, S-190, S-271 | Annual S-271 Refresher |

4  [1] All Exclusive-Use Fire Helicopter positions require an arduous fitness rating.

5  [2] Minimum experience and qualifications required prior to performing in the

6  Exclusive Use position. Each level must have met the experience requirements

7  of the previous level(s).

8  [3] Minimum training required to perform in the position. Each level must have

9  met the training requirements of the previous level(s).

10  [4] A "season" is continuous employment on a full-time wildland fire helicopter

11  crew for a period of 90 days or more.

12  [5] After completing S-372, must attend Interagency Helicopter Manager

13  Workshop (RT-372) every two years.

14  [6] Must attend IAT Modules as required by agency for Helicopter Manager.

15  [7] Must receive S-271 Refresher or serve as S-271 instructor every year.

16  **Note**: Exceptions to the above position standards may be granted, on a case-by-

17  case basis, by the BLM National Aviation Office, NPS Regional Office or FWS

18  Regional Office, as appropriate

19

20  **Helicopter Rappel & Cargo Let-Down**

21

22  **Policy**

23  Any rappel or cargo let-down programs must be approved by the Directors, Fire

24  and Aviation Management. All rappel and cargo let-down operations will follow

25  the *Interagency Helicopter Rappel Guide* (IHRG), as policy.  Any exemption to

26  the guide must be requested by the program through the state/region for

27  approval by the National Aviation Office.  The objective is to standardize

procedures and techniques that allow individuals or crews to be used for a
variety of missions.  To aid in this approach, methods are incorporated to cross
train personnel in more than one rappel system and more than one specific
helicopter type.

**Training and Qualifications**
Each Spotter and Rappeller is certified by an approved Rappel Check Spotter.
Check Spotters are approved annually by the State/Regional Aviation Manager
(S/RAM), ADM Training Specialist, or Helicopter Operations Specialist.  For
more information on Rappeller initial training and certification, refer to *IHRG*.

**Equipment and Procedure Development Process**
When a field user has a need for a new or improved piece of equipment and/or
procedure, documentation of that need must be submitted to the National Rappel
Equipment Committee. Upon recommendation by the National Rappel
Equipment Committee to the National Rappel Working Group it may be
provisionally approved for evaluation at selected bases. The National Rappel
Working Group is charged with all phases of oversight for the National
Interagency Rappel Program and makes recommendations to the Interagency
Helicopter Operations (IHOPS) Committee for final approval on all
equipment/procedures proposals. Proposals will be evaluated based on the
objectives and the following criteria:  critical safety, national focus, priority, and
probability of success.

**Aerial Ignition**
The *Interagency Aerial Ignition Guide (IAIG)* is policy for all aerial ignition
activities.  Any exemption to the *IAIG* must be requested through the
state/region for approval by the National Aviation Office.

**Airtankers**
Airtankers are a national resource. Geographic areas administering these aircraft
will make them available for initial attack and extended attack fires on a priority
basis.  All airtanker services are obtained through the contracting process
(except the MAFFS, which are Military Aviation Assets and used to supplement
the contract fleet when needed).

The Interagency Airtanker Board (IATB), consisting of Forest Service, DOI,
and states is responsible for approving the contract airtanker fleet.  Large
airtankers are procured under a national interagency contract.

The management of these resources is governed by the requirements of the *DM,
BLM Manual 9400*, and the *Interagency Airtanker Base Operations Guide
(IATBOG).*  Airtankers are operated by commercial vendors in accordance with
*FAR Part 137*.
- ***FS -** Forest Service operates under FSM 5703 and Grant of Exemption
392 as referenced in FSM 5714.*

**17-10**

**Operational Principles**

- Use retardant drops before an immediate need is recognized; pretreat according to expected fire behavior.
- Retardant dropped in the morning may still be effective in the afternoon.
- Build progressive retardant line.
- Use retardant drops to cool areas (reduce flame length), as necessary in support of ground forces.
- Be sure the line is clear of personnel prior to dropping retardant.
- Be alert for gaps in retardant lines.
- Expect fixed-wing vortices and rotor-wing down wash.
- Wildland fire can burn around, under, spot over, and with enough intensity, through retardant lines.
- Retardant drops should not be made within 300 feet of a waterway. Refer to *Interagency Leadplane Operations Guide (ILOG)*.

**Guidance for Pilots**

To meet the 300-foot buffer zone guideline, implement the following:

- Medium/Heavy Airtankers: When approaching a waterway visible to the pilot, the pilot shall terminate the application of retardant approximately 300 feet before reaching the waterway. Pilots shall make adjustments for airspeed and ambient conditions such as wind to avoid the application of retardant within the 300-foot buffer zone.

**Categories**

Airtanker types are distinguished by their retardant load:

- Type 1 - 3,000 gallons
- Type 2 - 1,800 to 2,999 gallons
- Type 3 - 800 to 1,799 gallons
- Type 4 - 799 gallons (single engine airtankers)

**Qualifications**

Type 1, 2, and 3 airtanker crews fall into two categories:

- Initial attack rated
- Initial attack candidates.

Type 4 (SEAT) pilots are classified as Level 1 or Level 2; both may operate without aerial supervision. Aerial supervision is required for a Level 2 SEAT pilot when more than two aircraft are operating within the incident airspace.

**Initial Attack Qualified -** A crew may drop retardant upon arrival at a fire without aerial supervision. This does not negate the requirements for aerial supervision if ordering agency policies, terrain, or congested areas dictate otherwise.

**Initial Attack Candidate -** A crew that is acquiring the experience, training, and prerequisite drops - but in the interim requires aerial supervision.

**Tanker Bases & Reload Facilities**

They may be contract or Force Account bases, and may be operated by the BLM, Forest Service, or states. Types of retardant (dry powder, liquid concentrate, etc.) will vary with locations.

Certain parameters for the operation of airtankers are agency-specific. For dispatch procedures, limitations, and times, refer to geographic area mobilization guides and the *Interagency Airtanker Base Operations Guide (IATBOG).*

**Airtanker Base Operations**

The *IATBOG* defines and standardizes operating procedures at all airtanker bases. It facilitates personnel exchange through standardization and provides a common interagency approach in the government's relationship with airtanker and retardant contractors. It provides special instructions for personnel at airtanker bases and can provide supplemental site-specific guidance.

**Airtanker Base Personnel**

The *IATBOG* identifies a generic table of organization and recommended staffing for airtanker bases. The guide describes the duties of various positions at airtanker bases. Currently, there is no identified training for the positions at airtanker bases; the *IATBOG* contains a chart of recommended training for each position. It is critical that reload bases staff up commensurate with the need during periods of moderate or high fire activity at the base. All personnel conducting airtanker base operations should review the *IATBOG* and have it available.

**Startup/Cutoff Time for Airtankers**

These limitations apply to the time the aircraft arrives over the fire.

- Normally airtankers shall be dispatched to arrive over the fire not earlier than 30 minutes after official sunrise and not later than 30 minutes before official sunset.
- Airtankers may be dispatched to arrive over a fire as early as 30 minutes prior to official sunrise, or 30 minutes after official sunset, provided:
  - ➤ A qualified ATGS, ASM1, or ATCO is on the scene; and
  - ➤ Has determined visibility and other safety factors are suitable for dropping retardant; and
  - ➤ Notifies the appropriate dispatcher of this determination.
- An airtanker, crewed by an initial attack-rated captain, may be dispatched to arrive over a fire without aerial supervision by an ATGS, ASM1, or ATCO provided the airtanker's arrival and drop activities are conducted between 30 minutes after official sunrise and 30 minutes before official sunset in the lower 48 states. In Alaska, an airtanker pilot will not drop retardant during periods outside civil twilight.

**Single Engine Airtankers**

**Single Engine Airtanker (SEAT) Operations**

The *Interagency SEAT Operating Guide (ISOG) (NFES #1844)* defines operating standards and is policy for both the DOI and FS.  A SEAT manager (SEMG) must be assigned to each SEAT operation**.**

**SEAT Manager Position**

In order to ensure adherence to contract regulations, safety requirements, and fiscal accountability, a qualified SEAT Manager (SEMG) will be assigned to each operating location. The SEMG's duties and responsibilities are outlined in the *ISOG*.

**SEAT Policy and Standards**

Units using SEATs will ensure the aircraft complies with appropriate AMD or FS contract standards prior to use.  For interagency SEAT standards, refer to AMD exclusive use and CWN contract provisions and the *ISOG*.

**SEAT Organization/ Training and Qualifications**

The SEAT Manager position has been adopted by NWCG (2002) (refer to the *ISOG*).

**Safety**

All SEAT operators and users will adhere to AMD/Forest Service safety standards.  Flight operations, pilot requirements, flight crew duty and flight limitations, and the use of PPE are addressed in the above referenced standards.

**Pilot Training**

All SEAT pilots will meet the minimum fire training standards as described in their contract.  The following outline has been approved and includes the following fire topics as a minimum.

- Fire behavior.
- Air/ground tactical operations.
- Incident organizational structure and terminology.
- Fire perimeter designation.
- Radio communications and procedures.
- Use of retardants and suppressants.
- Mountain flying techniques.
- Unit-specific operational guidelines as appropriate.

**Operational Procedures**

Using SEATs in conjunction with other aircraft over an incident is standard practice. Agency or geographical area mobilization guides may specify different procedures and limitations.

Depending on location, operator, and availability, SEATs are capable of dropping suppressants, water, or other approved retardants.  The fixed tanks are fiberglass.

Because of the load capacities of the SEATs (400 to 800 gallons), quick turn-around times should be a prime consideration.  SEATs are capable of taking off and landing on dirt, gravel, or grass strips (pilot must be involved in selection of the site); a support vehicle reduces turn-around times.

Reloading at established airtanker bases or reload bases is authorized.  (SEAT operators carry the required couplings).  All base operating plans must include SEAT loading criteria.

**Guidance for Pilots when dropping around waterways**

To meet the 300-foot buffer zone guideline, implement the following:

- Single Engine Airtankers/Helicopters:  When approaching a waterway visible to the pilot, the pilot shall terminate application of retardant or foam approximately 300 feet before reaching the waterway.  The pilot shall make adjustments for airspeed and ambient conditions such as wind to avoid the application of retardant or foam within the 300-foot buffer zone.

**Communication**

All SEATs must have one VHF-AM and one VHF-FM (programmable) multi-channel radio. (See contract specifications.)

**Aerial Supervision**

Aerial supervision resources will be dispatched, when available, for initial and extended attack to enhance efficiency and safety.  During initial response operations the recommended aerial supervision in priority order with regard to safety and efficiency is as follows:

- ASM1
- ATGS
- ATCO (Leadplane)
- Smokejumper Spotter
- Helicopter Manager

If aerial operations continue beyond initial response, an ASM1, ATGS, or ATCO will be ordered.  Aerial supervision response will be commensurate with expected complexity.

**Reconnaissance or patrol flights**

The purpose of aerial reconnaissance or detection flights is to locate and relay fire information to fire management.  Only qualified Air Tactical Group Supervisors, Air Tactical Supervisors (ATS-ASM) and Lead Plane Pilots have the training and authority to coordinate fixed and rotor wing aerial firefighting operations.  Flights with a "Recon" or "Patrol" designation should communicate

1 with tactical aircraft only to announce location, altitude and to relay their
2 departure direction and altitude from the incident.
3
4 **Aerial Supervision over Incidents**
5          **References are listed below the table\***

| Situation | Lead/ATCO/ASM1 | Ref | ATGS | Ref |
|---|---|---|---|---|
| Airtanker not IA rated. | Required | 1 | | |
| MAFFS | Required | 1 | | |
| Retardant drops in congested areas. | Order | 1 | May use if no Lead/ATCO/ASM1. | |
| Level 2 rated SEAT operating over an incident with more than one (1) other tactical aircraft on scene. | Required if no ATGS | 1 | Required if no Lead/ATCO/ASM1. | 1 |
| Foreign Government airtankers. | Required if no ATGS | 1 | Required if no Lead/ATCO/ASM1. | 1 |
| Retardant drops conducted between 30 minutes prior to, and 30 minutes after sunrise, or 30 minutes prior to sunset to 30 minutes after sunset. | Required if no ATGS | 1, 2 | Required if no Lead/ATCO/ASM1. | 1, 2 |
| 4 or more airtankers assigned. | Order | 1 | Order | 1 |
| 2 or more helicopters with 2 or more airtankers over an incident. | Order | 1 | Order | 1 |
| Periods of marginal weather, poor visibility or turbulence. | Order | 1 | Order | 1 |
| 2 or more airtankers over an incident. | Order | 1 | Order if no Lead/ATCO/ASM1. | 3 |
| When requested by airtanker or ATGS | Required | 1 | Required | |
| Smokejumper or paracargo aircraft with 2 or more airtankers over an incident. | Order if no ATGS | 1 | Order if no Lead/ATCO/ASM1. | 1, 4 |
| Incident has two or more branches. | | | Order | 1, 4 |

*This table summarizes interagency aviation supervision policy, but individual agency policy must be consulted for currency and consistency.

**Note:** Aerial Supervision Modules (ASM1) may act as either a Lead or ATGS depending on incident requirements.

*Interagency Lead Plane Operations Guide (and Interagency Air Tactical Group Supervisors Guide) (NFES 1393).*

Requires determination by ATGS or Lead that visibility and safety factors are suitable and dispatch has been notified of this determination.

FS FSM 5716.32.

Both the *ILOG* and *ATGS* Guide reference ordering an ATGS only for these missions. FSM 5716.32 classifies these missions as complex. An ATCO and/or HLCO should be ordered as appropriate in addition to the ATGS.

Definitions of Key Words Used in the aerial supervision requirements chart.

- **Required -** Aerial supervisory resource(s) that shall be over the incident when specified air tactical operations are being conducted.
- **Ordered -** Aerial supervisory resources that shall be ordered by the controlling entity. (Air tactical operations may be continued while the aerial supervision resource is en route to the incident. Operations can be continued if the resource is not available.)
- **Over -** The air tactical resource is flying above or is in a holding pattern adjacent to the incident.
- **Assigned -** Tactical resource allocated to an incident. The resource may be flying en route to and from, or on hold at a ground site.

**Low-level Flight Operations**

The only fixed-wing aircraft missions authorized for low-level fire operations are:

- Para-cargo.
- Aerial Supervision Module-1 (ASM1) and leadplane operations.
- Retardant, water and foam application.

**Operational Procedures:**

- A high-level recon will be made prior to low-level flight operations.
- All flights below 500 feet will be contained to the area of operation.
- All resource flights below 500 feet must have an approved plan.
- PPE is required for all fixed-wing, low-level flights. Helmets are not required for multi-engine airtanker crews, smokejumper pilots and ASM flight/aircrew members.
- *FS - The use of the Aerial Supervision Module Operations Guide (ASMOG) as appended in the Interagency Leadplane Operations Guide (ILOG) is identified in FSM 5706 and will be implemented for the 2004 season.*

**Congested Area Flight Operations**

Airtankers can drop retardant in congested areas under DOI authority given in FAR Part 137. FS authority is granted under exemption 392, from FAR 91.119 as referenced in FSM 5714. When such operations are necessary, they may be authorized subject to these limitations:

- Airtanker operations in congested areas may be conducted at the request of the city, rural fire department, county, state, or federal fire suppression agency.
- An ASM1/leadplane is ordered to coordinate aerial operations.
- The air traffic control facility responsible for the airspace is notified prior to or as soon as possible after the beginning of the operation.
- A positive communication link must be established between the airtanker coordinator or aerial supervision module (ASM1), airtanker pilot(s), and the responsible fire suppression agency official.
- The Incident Commander (IC) for the responsible fire agency or designee will advise the ASM1/leadplane/airtanker that all non-essential people and movable property have been cleared prior to commencing retardant drops.

**Aerial Supervision Module 1 (ASM1)**

The Aerial Supervision Module is crewed with both a "Lead" qualified pilot (ATP) and an Air Tactical Supervisor (ATS). These individuals are specifically trained to operate together as a team. The resource is primarily designed for providing both functions (lead and Air Attack) simultaneously from the same aircraft, but can also provide single role service, as well.

The Air Tactical Pilot is primarily responsible for aircraft coordination over the incident. The Air Tactical Supervisor develops strategy in conjunction with the IC, and when no IC is present, assumes those responsibilities until ground personnel arrive.

- *BLM - The Aerial Supervision Module Operations Guide (ASMOG) and Interagency Leadplane Operations Guide (ILOG) are policy for BLM.*

**Operational Considerations**

The ASM1 is a shared national resource. Any operation that limits the national resource status must be approved by the agency program manager. Aerial or incident complexity and environmental considerations will dictate when the ASM1 ceases low level operations. The ASM flight crew has the responsibility to determine when the complexity level of the incident exceeds the capability to perform both ATGS and leadplane functions from one aircraft. It will request additional supervision resources, or modify the operation to maintain mission safety and efficiency.

The crew has the responsibility to determine when the complexity level of the incident exceeds the capability to perform both ATGS and leadplane functions

from one aircraft.  It will request additional supervision resources to maintain operational safety.

**Policy**

Only those individuals certified and authorized by the BLM - National Aviation office, or the FS - National Aviation Operations Officer, will function as an Air Tactical Supervisor (ATS) in an ASM mission profile.

**Aerial Supervision Module Program Training and Qualifications**

Training and qualification requirements for ASM1 crewmembers are defined in the Interagency Aerial Supervision Module Guide (IASMOG) ILOG appendix A.

**Air Tactical Group Supervisor (ATGS)**

The ATGS is primarily responsible for coordination of aircraft operations and firefighter safety on an incident.  Specific duties and responsibilities are outlined in the *Fireline Handbook (PMS 410-1) and the Interagency Air Tactical Group Supervisor's Guide (NFES 1393)*.  The ATGS reports to the Air Operations Branch Director (AOBD), or in the absence of the AOBD, to the Operations Section Chief (OSC), or in the absence of the OSC, to the IC.  When airborne, the ATGS works for the IC or OSC, depending on the size of the incident. When the positions are in use on an incident, the Airtanker Coordinator (ATCO) and Helicopter Coordinator (HLCO) will be supervised by the ATGS.  The ATCO, commonly called a leadplane pilot, provides direct supervision to fixed-wing retardant aircraft, while the HLCO directs tactical coordination and airspace management for rotary-wing aircraft.

Currently there are three operational modes for ATGS operations:

- The ATGS is in a contracted or ARA (rental) fixed-wing aircraft in orbit over the incident.  It will always occur above 500' AGL.  Pilot/aircraft carding requirements must be met, and PPE is recommended.
- The ATGS is in a contracted, CWN, or ARA (rental) rotary-wing aircraft, and PPE is required.
- The ATGS is on the ground with a vantage point of the entire incident. Generally only used due to an aircraft shortage, it is effective when the entire area can be viewed from the ground and the ATGS has VHF-AM and VHF-FM radio communication capability.
- *FS - PPE is required for FS ATGS operations below 500' AGL as per agency standard FSM 5700.*

**Operational Considerations**

A relief ATGS and aircraft or ASM1 should be ordered for sustained operations to ensure continuous coverage over an incident.  Personnel who are performing aerial reconnaissance and detection will not perform air tactical duties unless they are fully qualified as an ATGS.  Air tactical aircraft must meet all the basic

requirements listed in the National Air Tactical/Reconnaissance Standards and the pilot must be carded to perform the air tactical mission.

**Leadplane**

A leadplane is a national resource. The *Interagency Leadplane Operations Guide (ILOG)* is agency policy. Agency policy requires an ASM1/leadplane to be on order prior to retardant drops over a congested area. Operations may proceed before the SM1/leadplane arrives, if communications are established, authorization is granted from the IC, and the line is cleared prior to commencing retardant operations.

All firefighting aircraft are required to have operative transponders and will use a setting of 1255 when over the incident, unless given a discrete code by Air Traffic Control (ATC).

**Airspace Coordination**

The Interagency Airspace Program is an aviation safety program designed to enhance aviation safety and reduce the risk of a mid-air collision. Guidance for this program is found in the *Interagency Airspace Coordination Guide (IACG) 2003*, which has been adopted as policy by the AMD and USDA Forest Service. Additional guidance may be found in the *National Interagency Mobilization Guide* and supplemented by local Mobilization Guides.

The *IACG* is the primary document to be used by aviation personnel for airspace issues. Additional information is located on several agency airspace websites http://www.fs.fed.us/r6/fire/aviation/airspace/web/index.html and http://airspace.nifc.gov/mapping/nifc/index.cfm

Flight planning and Temporary Flight Restriction (TFR) information on World Aeronautical (WAC) Sectional and Global Navigational Charts (GNC) has been made available at the BLM Airspace Information System website. TFRs are updated every 30 minutes during normal business hours 7 days a week. In addition, a tactical chart with TFR specific information with incident names, frequencies and altitudes are available. These charts are all current versions. These charts can be found at http://airspace.nifc.gov/mapping/nifc/index.cfm Additional references can be found by contacting:

- ***BLM -*** *State Aviation Managers, Regional Airspace Coordinator and the BLM National Aviation Office Airspace Coordinator.*
- ***FS -*** *Regional Aviation Safety Officers, Regional Airspace Coordinators and the FS Airspace Program Manager.*
- ***FWS -*** *National Aviation Safety and Operations*
- ***NPS -*** *Regional Aviation Officers.*

**Policy**

The 9400-1a, Aircraft Flight Request/Schedule Form, will be used for approval and flight planning. This form will be completed between the aircraft dispatcher

and flight manager for missions not requested on a Fire Resource Order.  The fixed-wing or helicopter manager will use this form to brief the pilot on the mission.

- *NPS - Reference RM 60, Appendix 3 & 4.*

Special use flight plans require approval by the immediate supervisor and final approval by the appropriate line manager.

- *NPS - Approval per unit aviation management plan.*
- **FWS -** *National Aviation Safety and Operations Specialist.*

**Types of Flights**

There are two types of flights: point-to point and mission flights.

**Point-to-point flights** typically originate at one developed airport or permanent helibase, with the direct flight to another developed airport or permanent helibase. These flights require approved pilots, aircrew, and aircraft.

- A point-to point flight is conducted higher than 500 feet above ground level (AGL).

**Mission flights** are defined as flights not meeting the definition of point-to-point flight.  A mission flight requires work to be performed in the air (retardant or water delivery, fire reconnaissance, smokejumper delivery), or through a combination of ground and aerial work (delivery of personnel and/or cargo from helibases to helispots or unimproved landing sites, rappelling or cargo let-down, horse herding).

- **FS -** *Refer to FSM 5710.5 for administrative use, FSM 5705 for point-to-point and mission use for types of Forest Service flights.*

**Fixed-wing Aircraft**
**Point-to-point Flights**

All agency flights shall be approved using an aircraft request/flight schedule, USDI form 9400-1a. This form is used to authorize, plan and brief the pilot on non-fire flights.

Agency policy requires designating a fixed-wing manager for point-to-point flights transporting personnel.  The duties and responsibilities of the flight manager are:

- Check pilot card to ensure qualifications are current for aircraft type.
- Check aircraft card to ensure that aircraft is current and approved for the mission.
- Flight plan/flight following: filed with FAA or agency, facilitate as needed. (Filing, opening, and closing the FAA flight plan is the responsibility of the pilot.)
- Pilot briefing to passengers.

- Ensure passengers have received and understand briefing; all personnel on board are either air crew members, or authorized or official passengers.
- Check fiscal documents; ensure flight payment paperwork is accurate, (as outlined on the 9400-1a form) for the flight, and that procurement document and all signatures are secured.
- *NPS - Reference RM-60, Appendix 3 for agency specific policy.*

**Mission Flights**

Mission flights are aircraft operations associated with initial attack of wildfires, large fire support, and resource management.

- PPE is required for a mission flight conducted within 500'AGL.
- All personnel will meet training and qualification standards required for the mission.
- Mission flights for fixed-wing aircraft include but are not limited to the following:
  - ➢ Water or retardant application
  - ➢ Parachute delivery of personnel or cargo
  - ➢ ATGS operations (PPE recommended but not required)
  - ➢ Airtanker coordinator operations
  - ➢ Takeoff or landing requiring special techniques due to hazardous terrain, obstacles, pinnacles, or surface conditions
  - ➢ Fire reconnaissance (PPE recommended but not required)
  - ➢ Precision reconnaissance
- *NPS - Refer to RM-60, Appendix 3 and 4*

**Helicopters**

**Mission Flights**

Mission helicopter flights include but are not limited to the following:

- Flights conducted within 500 feet AGL
- Water or retardant application
- Helicopter coordinator and ATGS operations
- Aerial ignition activities
- External load operations
- Night vision goggle operations
- Hoversite/autosurvey
- Rappelling
- Aerial capture, eradication, and tagging of animals
- Offshore vessel or platform landings
- Toe-in, single-skid and step-out landings (prior authorization or exemption is required)
- Takeoff or landing requiring special techniques due to hazardous terrain, obstacles, pinnacles, or surface conditions
- Free-fall cargo
- Fire reconnaissance

- Precision reconnaissance

The use of PPE is required for both helicopter flight missions and ground operations.  The specific items to be worn are dependent on the type of flight, the function an individual is performing, or the ground operation being conducted.  Refer to the tables in Chapter 9 of the *IHOG* for specific requirements.

- **BLM -** *The flight request form, 9400-1a, is used when requesting fixed-wing or helicopters for non-fire missions. Reoccurring or "Special Use", resource mission flights require an approved Project Aviation Plan.  A one time "Special Use" mission may use the reverse side of BLM form 9400-1a for this purpose.*
- **NPS -** *Refer to RM60 Appendix 3, planning guide, flight request form, 9400-1a.*

### Flight-Following All Aircraft

Coordinating and confirming with the pilot the method of flight-following that will be utilized for any flight is the responsibility of the scheduling dispatch office. When agency flight following (radio or satellite) is being used, the scheduling dispatch office shall have flight following responsibility until transferred through a documented, positive hand-off.  All dispatch centers designated for fire support shall have the capability to transmit and receive "National Flight Following" and Air Guard" within their area of responsibility. Flight-following reports from the aircraft are the responsibility of the pilot-in-command (PIC) in accordance with 14 CFR.  Violation of flight-following standards requires submission of a SAFECOM.

For tactical aircraft that cross dispatch area geographic boundaries, the receiving unit is responsible to confirm arrival of the aircraft via landline to the sending Geographic Area Coordination Center.

- **BLM/FWS/NPS -** *Refer 351 Departmental Manual - Flight Operations Standards and Procedures, IHOG Chapter 4, and National and Geographic Area Mobilization Guides for specific direction.*
- **FS -** *Refer FSM 5700, FSH 5709 handbooks, IHOG Chapter 4, and National and Geographic Area Mobilization Guides for specific direction.*

### Point to Point, Non-Mission Flights

Agency Radio communication is not mandatory.  Flight Following for point to point, non-mission flights shall be accomplished using one of the following methods:

- **FAA IFR or VFR flight plan**

  Pilot/chief of party shall notify sending/receiving dispatch office of ETD, ETA and ATA.  Radio Communication with agency dispatch office is not required.

- **Agency check-in via radio**
  - Pilot checks in via radio with agency dispatch office on set intervals during duration of flight (usually every 15 to 20 minutes).
- **Satellite Flight Following**
  - Pilot checks in with agency dispatch office just prior to or shortly after take off, and after landing. Agency Dispatch office monitors flight via computer for duration of flight. No intermediate check-ins is required.
  - This should be supplemented with FAA IFR or VFR flight plan.

**Mission Flights**

Agency FM radio capability is required for all mission flights. Flight Following for mission flights shall be accomplished using one of the following methods:

- **Agency check-ins via radio**
  - Pilot checks in via radio with agency dispatch office on set intervals during duration of flight (usually every 15 to 20 minutes).
- **Satellite Flight Following**
  - Pilot checks in with agency dispatch office just prior to or shortly after take off, and after landing. Agency Dispatch office monitors flight via computer for duration of flight. No intermediate check-ins is required.
  - Pilot shall monitor assigned agency FM frequency, including guard, for duration of flight. If satellite signal is lost, or dispatch office computer fails, revert to radio check-in procedure above.

**Aviation Communication "Watch Out" Situations**

When one or more of the following situations exist, they must be mitigated before aerial operations are continued:

- Poor or intermittent communications with ground and/or air resources.
- Ground resources are not continuously monitoring and communicating on assigned Air-to-Ground frequency.
- Any arrival of air resources in the incident airspace without establishing positive communications.
- Radio frequency overload or inattention makes communications difficult or ineffective.
- Any aircraft in the incident airspace with inoperable radios.
- Airtankers, Leadplanes or SEATs do not have a clear frequency to conduct retardant drop communications.
- Aircraft frequency assignments are changed in the middle of the day or during aerial operations.
- An aircraft emergency or medivac occurs.