

A publication of the
**National Wildfire
Coordinating Group**

Interagency Single Engine Air Tanker Operations Guide



PMS 506

April 2014

NFES 001844

Interagency Single Engine Air Tanker Operations Guide

PMS 506
April 2014
NFES 001844

Sponsored for NWCG publication by the NWCG National Interagency Aviation Committee. Questions regarding content of this publication should be directed to Interagency SEAT Steering Committee, part of the NWCG National Interagency Aviation Committee as stated in Appendix B and at the national SEAT Web site

<http://www.blm.gov/nifc/st/en/prog/fire/Aviation/Airops/seat.html>. Questions and comments may also be emailed to BLM_FA_NWCG_Products@blm.gov.

This product is available electronically from the NWCG Web site at <http://www.nwcg.gov>. Printed copies may be ordered from the Great Basin Cache, National Interagency Fire Center, Boise ID. For ordering procedures and costs, please refer to the annual NFES Catalog Part 2: Publications posted at <http://www.nwcg.gov/pms/pubs/catalog.htm>.

Previous editions: 2011.

The National Wildfire Coordinating Group (NWCG) has approved this information for the guidance of its member agencies and is not responsible for the interpretation or use of this information by anyone else.

NWCG's intent is to specifically identify all copyrighted content used in NWCG products. All other NWCG information is in the public domain. Use of public domain information, including copying, is permitted. Use of NWCG information within another document is permitted, if NWCG information is accurately credited to the NWCG. The NWCG logo may not be used except on NWCG authorized information. "National Wildfire Coordinating Group", "NWCG", and the NWCG logo are trademarks of the National Wildfire Coordinating Group.

National SEAT Program Web Site

<http://www.blm.gov/nifc/st/en/prog/fire/Aviation/Airops/seat.html>

The Bureau of Land Management, Office of Fire and Aviation, located at the National Interagency Fire Center, Boise Idaho, hosts a Web site to provide general information about the national Single Engine Air Tanker (SEAT) Program. The Web site contains the following information:

- **Interagency SEAT Operations Guide (ISOG)**
- **Interagency SEAT Operational Procedures Handbook**
- **SEAT Contracts**
- **AMD SEAT Source List**
- **SEAT Training Calendar**
- **Downloadable forms for SEAT Management**
- **Reference material information**
- **And more...**

Come Visit Us!

Table of Contents

CHAPTER 1 – INTRODUCTION 1

I. Objectives..... 1

II. Scope..... 1

III. Authority..... 1

IV. Participating Agencies..... 1

V. Reviews and Revision..... 1

VI. Publishing, Ordering and Distribution..... 2

CHAPTER 2 – PERSONNEL 3

I. Introduction..... 3

II. SEAT Pilot Requirements..... 3

 A. Pilot Certification..... 3

 B. Flight/Duty Hour Limitations..... 3

 C. Flight Crew Limitations..... 3

III. SEAT Pilot Carded Ratings..... 3

 A. Level II Rated Pilots..... 4

 B. Level I Rated Pilots..... 4

IV. SEAT Manager (SEMG) Position..... 4

 A. General..... 4

 B. Qualification Documents..... 4

 C. Span of Control..... 4

 D. The SEMG Duties and Responsibilities..... 5

 E. SEMG Duties at established *Large Air Tanker Bases*..... 8

 F. SEMG Training and Experience..... 8

 G. SEMG Dress Code..... 9

 H. SEMG Kit and Mandatory Guides, Reference Material and Forms..... 9

 I. SEMG Decertification..... 10

V. *Field* SEAT Coordinator (SECO) Position..... 11

 A. Introduction..... 11

 B. Delegation of Authority..... 11

 C. Field SECO Duties and Responsibilities:..... 11

 D. Qualification and Experience Requirements..... 13

 E. Nomination and Approval Process..... 13

VI. *Geographic Area SEMG Representatives*..... 13

CHAPTER 3 – OPERATIONAL PLANNING 14

I. Introduction..... 14

II. General Flight Safety..... 14

 A. Flight Safety..... 14

 B. Situational Awareness..... 15

C.	Minimum Safe Altitudes.....	15
III.	Types of Flight Missions.....	15
A.	Ferry Flight or Repositioning of Aircraft.....	15
B.	Initial Attack Missions.....	15
C.	Extended Attack Missions.....	16
D.	Fire Missions within an Incident Management Team Structure.....	16
E.	Day/Night Flight Limitations.....	16
F.	Flights Over Congested Areas.....	16
G.	Mission Currency Training Flights.....	16
H.	<i>Fire Chemical Use Near Waterways/Sensitive Areas</i>	17
I.	<i>Considerations When Using Amphibious Aircraft</i>	17
J.	Required Support Equipment.....	17
IV.	SEAT Contracting.....	17
A.	National On-Call Contract.....	18
B.	Exclusive Use Contracts.....	18
V.	Placing an Order for a SEAT.....	18
A.	National On-Call Contract.....	18
B.	Exclusive Use.....	18
VI.	Preparing for SEAT Operations.....	18
A.	Funding.....	18
B.	Facilities.....	19
C.	Aircraft Management.....	19
D.	Operational Planning.....	19
E.	Availability.....	19
F.	Meals.....	20
G.	Lodging.....	20
H.	Jettison Areas.....	20
I.	Process for Returning a SEAT to Contract Availability.....	20

CHAPTER 4 – FLIGHT FOLLOWING, RESOURCE TRACKING AND COMMUNICATIONS 21

I.	Introduction.....	21
A.	Definition of Flight Following.....	21
B.	Definition of Resource Tracking.....	21
II.	Flight Following.....	21
A.	Flight Following Requirements.....	21
B.	Methods of Flight Following.....	21
C.	Documentation Required for Flight Following.....	22
D.	Flight Following Check-in Facilities.....	22
E.	Flight Following and Resource Tracking Options & Requirements.....	22
F.	Check-in Information.....	23
G.	Failure to Meet Check-in Requirements.....	23
III.	Resource Tracking.....	23

IV.	Communication Requirements.....	23
V.	Incident Communications Plan and Frequencies.....	24
	A. SEAT Base RAMP Frequencies.....	24
	B. Air-to-Air Tactical Communications and Frequencies.....	24
	C. Air-to-Ground Tactical Communications and Frequencies.....	25
	D. Command Communications and Frequencies.....	25
	E. Air Guard Communications and Frequency.....	25
	F. Communication Requirements and Options.....	25
	G. <i>Sterile Cockpit Environment</i>	27
	H. Fire Traffic Area (FTA).....	27

CHAPTER 5 – SEAT AIRCRAFT REQUIREMENTS, CAPABILITIES AND LIMITATIONS 28

I.	Introduction.....	28
II.	SEAT Aircraft Performance Standards.....	28
	A. Wind and Turbulence Limitations for SEAT Operations.....	28
III.	Aircraft Equipment, Communications and Instrument Requirements.....	28
IV.	Tank and Gate Requirements and Standards.....	29
V.	SEAT Aircraft Markings.....	29

CHAPTER 6 – SEAT BASES AND LANDING AREAS 31

I.	Introduction.....	31
II.	Planning.....	31
III.	Operations from established Air Tanker Bases.....	31
IV.	Operations from <i>Established bases and Airports</i>	31
V.	<i>SEAT Base Categories</i>	32
VI.	Required Elements for SEAT Bases.....	32
VII.	SEAT Base Operating Plan.....	33
VIII.	SEAT Base Security.....	33
	A. Aircraft Security.....	33
	B. SEAT Base Facilities.....	33

CHAPTER 7 – PERSONAL PROTECTIVE EQUIPMENT REQUIREMENTS 34

I.	<i>Ramp Operations Personal Protective Equipment</i>	34
----	--	----

CHAPTER 8 – SEAT LOADING AND REFUELING..... 35

I.	Introduction.....	35
II.	Single Engine Air Tanker Hot Loading/Fueling.....	35
	A. Purpose.....	35
	B. Objectives.....	35
	C. Definition.....	35
	D. Responsibility.....	36
	E. Site Specific Loading/Fueling Procedures.....	36

INTERAGENCY SINGLE ENGINE AIR TANKER OPERATIONS GUIDE

III. Hot Loading Procedures..... 36
 A. Initial Arrival Procedures..... 36
 B. Ramp Procedures..... 36
 C. Retardant/Suppressant Loading Procedures..... 37
IV. Refueling SEAT Aircraft..... 37
 A. Emergency Procedures..... 38
 B. General Precautions..... 38
GLOSSARY..... 39
APPENDICES 61
Appendix A: *SEAT Base Staffing Matrix and Training Elements*..... 62
Appendix B: *SEAT Base Operations Plan*..... 63
Appendix C: *SEAT Base Checklist*..... 64
Appendix D: *Hand Signals for Airtanker Base Ramp Operations*..... 65
Appendix E: Interagency Single Engine Air Tanker Board Contacts..... 66
Appendix F: Single Engine Airtanker Program Request for Revision..... 67

CHAPTER 1 – INTRODUCTION

I. Objectives.

The objectives of the Interagency Single Engine Air Tanker Operations Guide (ISOG) are to:

- A. Promote safe, cost effective and efficient aviation services in support of agency and interagency goals and objectives.
- B. Define and standardize national interagency single engine air tanker (SEAT) operational procedures.
- C. Through standardization, facilitate interchange and cross utilization of agency SEAT resources.
- D. Provide a common, interagency operational guide when working with SEAT contractors and agency air operations management.
- E. Provide a framework within which Areas, Regions, States, and local units can provide supplemental agency specific guidance.

II. Scope.

The standards and procedures contained in this guide apply to SEAT operations conducted by participating agency providers and users of SEATs.

III. Authority.

- A. This document has been adopted as operational policy by all participating Department of the Interior (DOI) agencies and the U.S. Forest Service.
- B. The aviation manuals of participating agencies contain the authority to publish this guide.

IV. Participating Agencies.

All federal SEAT contracts are administered by the Department of the Interior *Office of Aviation Services* (DOI-*OAS*). Program management responsibility is vested with DOI Bureau of Land Management in accordance with lead agency concepts.

V. Reviews and Revision.

An interagency steering and standards committee consisting of representatives from agencies utilizing SEATs will update this guide on a three year cycle. This committee is formally called the Interagency Single Engine Air Tanker *Board*. The BLM SEAT Program Manager serves as Chair, SEAT Board, and USFS, BIA, DOI-*OAS* and a State representative serve as members.

Users are encouraged to recommend changes to this document through their respective aviation program managers. There is a process set up to facilitate this initiative, described later in this document. A list of agency contacts serving on the SEAT Board is included in *Appendix E* of this document.

Changes made to this document since the previous editions are printed in bold italics.

VI. Publishing, Ordering and Distribution.

Copies of the ISOG guide are available to order through the Great Basin Fire Cache, located at NIFC, Boise, Idaho. Current ordering information is contained in the annual *NFES Catalog Part 2 – Publications* located on the NWCG Web site at <http://www.nwcg.gov/pms/pubs/catalog.htm>.

This document is posted on the NWCG Web site at <http://www.nwcg.gov/pms/pubs/pubs.htm> and on the BLM National SEAT Web site at <http://www.blm.gov/nifc/st/en/prog/fire/Aviation/Airops/seat.html>.

CHAPTER 2 – PERSONNEL

I. Introduction.

This section discusses the qualifications, training, certification and currency requirements necessary to perform as a SEAT pilot, as well as the duties and responsibilities of the SEAT manager and SEAT coordinator.

II. SEAT Pilot Requirements.

A. Pilot Certification.

The United States Department of the Interior *Office of Aviation Services* (USDOI-*OAS*) is responsible for inspecting and approving SEAT pilots, aircraft, and support vehicles for interagency use. The USDOI-*OAS* uses an Interagency Pilot Qualification Card, an Aircraft Data Card, and a Service Truck Data Card to document this process. Specific qualifications and certifications necessary to be carded as a seat pilot will be listed in the procurement document.

B. Flight/Duty Hour Limitations.

All SEAT pilots *must* comply with the Flight Crew Member Duty and Flight Limitations in the *procurement document*. This section stipulates a maximum of 14 consecutive duty hours during any assigned duty period *must* be adhered to at all times. The pilot *must* be given a minimum of ten consecutive hours of rest (off duty), not to include any pre-flight or post-flight activity, prior to any assigned duty period. During any 14 consecutive calendar days the pilot *must* be given 2 calendar days of rest.

C. Flight Crew Limitations.

Flight Crew *must* be limited to a maximum of eight hours flight time during any assigned duty period, and a maximum of 42 hours flight time during any consecutive six day period. When a pilot acquires 36 or more flight hours in a consecutive six day period, the pilot *must* be given the following calendar day off for rest, after which a new six day cycle will begin.

During times of prolonged heavy fire activity, the Federal agencies may issue a notice reducing the pilot duty day and/or flight time limits, on a local, regional, agency, or interagency wide basis.

III. SEAT Pilot Carded Ratings.

All SEAT pilots shall be rated and carded as either a Level I or Level II. *They are utilized within the following limitations*

A. **Level II Rated Pilots.**

Level II permits pilot performance of missions without benefit of aerial supervision in the fire **traffic area (FTA)** with the SEAT plus one other aircraft. With more than two aircraft **within the FTA**, aerial supervision for the Level II pilot is required.

B. **Level I Rated Pilots.**

The Level I endorsement permits the pilot to perform missions in the fire environment airspace without aerial supervision, and allows them to conduct operations in a multiple tactical aircraft environment. This encompasses all missions from Initial Attack through large fire aerial operations. The Level I rated pilot will be familiar with and have experience in complex aerial fire suppression methods, and therefore will be more effective in those types of situations.

IV. SEAT Manager (SEMG) Position.

A. **General.**

In order to ensure adherence to contract specifications, safety requirements, and fiscal accountability, a qualified SEAT manager (SEMG) or **Air Tanker Base Manager (ATBM) when operating at an Air Tanker Base**, will be assigned to each operating location to provide for the management of the operation.

B. **Qualification Documents.**

All SEMGs and trainees must have a copy of their qualifications displayed on their agency's fire and aviation qualifications documentation card at all times. SEMGs will not be allowed to manage a SEAT if they do not have their agency's card with them in the field.

C. **Span of Control.**

✓ ***Administrative Span of Control***

- The SEMG will be allowed to **administratively** manage up to three SEATs without the assistance of additional SEMGs. This span of control is intended to be the maximum allowable for a trained and experienced SEMG. It is also dependent on the ability **and comfort** of the SEMG and the proximity of the aircraft location.

✓ ***Operational Span of Control***

- ***The SEMG must anticipate the need for and request additional personnel during periods of high activity and/or complexity and order additional personnel as necessary. During periods of high activity and/or***

complexity a minimum of two personnel should be on site during operations.

- *The SEMG has the authority to resolve all safety concerns encountered in any aspect of aircraft, ramp and/or personnel operations. By initiating corrective actions, these risks can be mitigated and/or removed. The SEMG should discuss any concerns and possible corrective actions with local fire management.*
- *Refer to the Recommended Best Practices for Minimum Staffing Levels in Appendix A for support positions that can be ordered.*
- ✓ *An ATBM is permitted to manage SEATs that are assigned to their base without a qualified SEMG present. All SEMG duties, responsibilities and span of control will be the responsibility of the ATBM. (See SEMG Duties at Established Air Tanker Bases.)*

D. The SEMG Duties and Responsibilities.

The duties and responsibilities of the SEMG are listed under the following categories:

- ✓ **Initial Contract Duties.**
 - *Complete Pre-Use Information and Inspection Sheet (SEAT-001) for Contractor/Vendor equipment and personnel.*
 - *Conduct Initial Pilot/Loader In-Briefing (Initial Pilot SEAT Briefing-001) with contractor personnel. Review base operations plan and local SOPs.*
 - *Ensures the “READ File” is available for pilots to review and sign. The READ File can be found at: <http://www.blm.gov/nifc/st/en/prog/fire/Aviation/safety.html>*
 - *Performs as liaison between contractor, airport, and using agency or unit.*
- ✓ **Daily Operational Duties.**
 - *Ensure operations adhere to the using agency guidelines and regulations, as well as continued compliance with relevant national requirements.*
 - *Communicate aircraft and staffing status to Dispatch on a daily basis.*
 - *Conduct daily briefings, mission briefings and debriefings with the pilots, other contract personnel and*

government employees assigned to the operation ***including mission priorities, quality of retardant, drop effectiveness, or any other problems or concerns that may arise. Document on Daily Ops Sheet.***

- Establish communications needs at the base of operations and ensures that all base radio equipment is maintained in working order. ***Communicate changes in frequencies as necessary.***
 - Regulate all aircraft and motor vehicle movements ***as well as supervise agency and contractor personnel*** on and around the SEAT operations base. SEMGs are responsible for the safe operation of the ramp and loading pit area. Although SEMGs are not required to be a qualified and current Ramp Manager, it is strongly recommended that each SEMG attend ramp manager training ***and complete the FWPT/RAMP task book***, as indicated in the *Interagency Air Tanker Base Operations Guide*. In addition, when the number of SEATs exceeds the standard span of control (3 per SEMG) additional personnel shall be ordered to provide adequate oversight of ramp operations and traffic control.
 - ***SEMG (t) will remain under the supervision of the SEMG at all times. Situations where the SEMG (t) operates at a site away from the trainer are not generally encouraged.***
 - Coordinate efforts to ensure that all fuel and retardant spills are properly cleaned according to the established base procedures or environmental and/or hazardous materials procedures.
 - Ensure retardant quality in mixing and testing to specifications prior to loading of aircraft by monitoring the refractometer readings documented by the contractor ***(or agency personnel when appropriate)*** and conduct periodical assurance checks.
 - ***Ensure retardant and water supplies and base logistical needs are adequate for anticipated fire activity.***
- ✓ **Administrative Duties.**
- Determine the type of contract ***and appropriate Task Order*** the SEAT was ordered under (National On-Call or Exclusive Use), and ensure compliance with contractual specifications.

- Complete required administrative and operational forms as required by local aviation management, and ensure that the contractor completes records and reports as required by the using agency.
- Ensure the official *SEAT Base Operating Plan* (SEAT-Plan-001) **Appendix B** has been completed for the base, **and update as necessary**. The operations plans at Large Air Tanker Bases will satisfy this requirement. The assigned SEMGs must be familiar with the plan in place.
- ***If the SEMG/ATBM is unable to confirm the SEAT Pre-Use Information and Inspections Sheet (SEAT-001) has been completed, they must complete the form prior to operations.***
- ***Accurately*** complete, the following documentation for each aircraft managed, on a daily basis regardless if any flight time has occurred
 - ***Aircraft Use Report (OAS 23E)***
 - SEAT Daily Operations Worksheet (SEAT-002)
 - Cost Summary Sheet (SEAT-003)
 - SEAT Pilot ***Flight Time/Duty Day Cumulative Log*** (SEAT-004)
 - SEAT ***Support/Service Vehicle Driver Duty Day Cumulative Log*** (SEAT-005)
- ***Email or Fax copies of the Daily Operations Worksheet to the National SECO and the assigned Project Inspector for that contract by 10 AM (MST) each day regardless of flight activity.***
- ⊖ Ensure retardant ***lot acceptance quality assurance (LAQA) procedures are followed*** by routing samples accordingly. ***Refer to MTDC website at www.fs.fed.us/rm/fire/wfcs/index.htm.***
- ⊖ ***When appropriate the SEMG will submit agency SAFECOMs in a timely manner through the proper channels.***
- Complete the *Evaluation Report on Contractor Performance (OAS-136A)* at the end of their assignment for each of the aircraft they have managed, and submit a copy to the Contracting Officer (CO).

- Document all aircraft maintenance on daily operations worksheet. Obtain COTR authorization to put aircraft back in contract availability if unscheduled maintenance resulted in unavailability. Communicate with local aviation manager.
- When SEAT aircraft are utilized by neighbor units, the originally assigned SEMG shall promptly contact the receiving SEMG/ATBM to discuss span of control and administrative duties.

E. **SEMG Duties at established Large Air Tanker Bases.**

ATBMs are authorized to manage SEATs without the presence of the SEMG while SEATs are assigned to work out of their base. When a SEAT is located at a large Air Tanker Base when no SEMG is assigned, the ATBM will be responsible for ensuring the safety, policy and contract compliance of the SEAT.

The following duties are outlined to help the SEMG coordinate with the Air Tanker Base Manager (ATBM) and assigned base personnel to ensure all efforts are being made for safe and efficient SEAT operations conducted from these bases.

- ✓ The ATBM is responsible for all aircraft and personnel working from their established base. All efforts MUST be made to coordinate all aspects of the SEAT operations with the ATBM.
- ✓ The ATBM will provide the SEMG, SEAT pilot and contractor personnel with a thorough briefing on the operational procedures and logistical support at the large air tanker base prior to commencing SEAT operations.
- ✓ The SEMG will coordinate with the ATBM regarding any separate loading and refueling areas or procedures in the event that SEAT loading is required to be separated from large air tanker retardant loading operations.
- ✓ The ATBM is responsible for ensuring the SEMG receives refractometer reading documentation for each load of retardant ensuring compliance with manufacturer's specification. The ATBM and the SEMG will coordinate all SEAT assignments or dispatches with each other and process the orders through the proper dispatch channels.

F. **SEMG Training and Experience.**

SEMG training is conducted by authorized cadre experienced in SEAT operations. SEMG is an NWCG red-carded position. After satisfactory completion of the nationally approved SEMG training

course, a prospective manager will serve as a trainee until it is determined that he or she is performing at the required level and providing the appropriate supervision. This shall be reflected in a properly documented task book.

- ✓ ***Training, qualifications, currency and experience requirements for this position are listed in PMS 310-1.***
- ✓ To maintain red card currency a SEMG is required to attend an approved SEAT Manager Workshop triennially. Elements and criteria of an approved SEAT Manager Workshop can be found on the BLM National SEAT Web site at:
<http://www.blm.gov/nifc/st/en/prog/fire/Aviation/Airops/seat.html>

G. SEMG Dress Code.

The intent of establishing a dress code for SEMGs is to maintain a level of safety for the manager and to instill a professional standard in appearance and enhance recognition while representing the Government during SEAT operations.

Dress codes will be the responsibility of the local unit and should be identified in the base operations plan.

H. SEMG Kit and Mandatory Guides, Reference Material and Forms

The operational SEAT Managers kit should include, but not be limited to, the following: (“hard copy” or downloaded to a USB device is acceptable as long as SEMG has access.)

The documents listed below can be found on the BLM National SEAT Web site at:

<http://www.blm.gov/nifc/st/en/prog/fire/Aviation/Airops/seat.html>

- ✓ Aircraft Use Report **OAS-23E**
- ✓ Interagency SEAT Operations Guide
- ✓ Current copy of the National SEAT Contract, Source List, **and Task Order List**
- ✓ Interagency Aviation Mishap Response Plan
- ✓ Aircraft Dispatch Form (NFES # 2657)
- ✓ Evaluation Report on Contractor Performance (136-A)
- ✓ **SAFECOMs**
- ✓ Initial Pilot/Manager Briefing
- ✓ ***The following SEAT forms are dated 2014:***
 - SEAT Pre-Use Information and Inspection Sheet (SEAT-001)
 - SEAT Daily Operations Worksheet (SEAT -002)
 - SEAT Cost Summary Sheet (SEAT-003)
 - SEAT Pilot Flight Time / Duty Day Log (SEAT-004)
 - SEAT Fuel Truck Duty Day Log (SEAT-005)
 - SEAT Base Operating Plan (SEAT-Plan-001)

- ✓ Eye Protection
- ✓ Ear Protection
- ✓ VHF-AM Hand Held Radio/Headset (*Should be provided by ordering Unit*).

Recommended items:

- ✓ Aviation Technical Assistance Directory
- ✓ Fire/Aviation Telephone Contact Directories
- ✓ National Interagency Mobilization Guide
- ✓ National Long-Term Fire Retardant Requirements Contract
- ✓ Interagency SEAT Operational Procedures Handbook (Job Aid)
- ✓ National Long-Term Fire Retardant Requirements Contract
- ✓ Pocket Calculator
- ✓ Pens and Pencils / Note Pads
- ✓ Flashlight
- ✓ Clock and/or Wrist Watch
- ✓ Programmable VHF-FM
- ✓ Cell Phone
- ✓ *Lap Top*

I. SEMG Decertification

If a SEMG is deficient and or unsafe in the performance of their duties and responsibilities:

- ✓ *The event will be documented on a performance evaluation or unit log as appropriate.*
- ✓ *The documentation will be forwarded to the State/Regional Aviation Manager and the individual's supervisor or sponsoring agency/official.*
- ✓ *All actions will be documented within the individual's IQCS record.*
- ✓ *The State/Regional Aviation Manager and the individual's supervisor or sponsoring agency/official will discuss the appropriate course of action to take including:*
 - *Immediate removal of the SEMG qualification.*
 - *The individual may be placed as unavailable in ROSS.*
 - *Evaluation of the individual's performance as a SEMG on an assignment by another highly experienced SEMG.*
- ✓ *If the evaluation assignment is selected, the following outcomes are possible with approval of the supervisor or sponsoring agency/official:*
 - *Satisfactorily perform as a SEMG on the evaluation assignment and return to available status in ROSS*
 - *If performance is unsatisfactory, individual will be returned to SEMG(t) status. Individual will remain in*

trainee status until a satisfactory performance is obtained

- *If satisfactory performance cannot be achieved, the SEMG qualification will be removed by the supervisor or sponsoring agency/official through the appropriate IQCS official.*

V. Field SEAT Coordinator (SECO) Position.

A. Introduction.

The SECO position was developed to be mobilized at a state or regional level to help coordinate SEAT operations within a geographical area. The intent for the SECO is to work with all interagency partners within the defined area. Efforts for mobilizing a SECO for a specified area should involve coordinating with ALL agencies utilizing SEATs within that area. While deployed, the SECO will be under the day to day direction of the local State Aviation Manager or Regional Aviation Officer.

B. Delegation of Authority.

The SECO will receive written delegation of authority identifying the participating agencies, points of contacts, and assignment objectives.

C. Field SECO Duties and Responsibilities:

- ✓ Perform as a liaison between the agency and each SEAT base of operations.
- ✓ Report directly to the agency's state or regional level aviation managers, when assigned to a specific area of responsibility.
- ✓ Perform base inspections in the field using the standard SEAT base inspection form developed for pre-season or readiness reviews.
 - Provide assistance in rectifying any discrepancies.
 - Offer recommendations to improve safety and operational efficiency.
- ✓ Report to the State Aviation Manager or Regional Aviation Officer or designee on a daily basis or other schedule that is approved in advance.
- ✓ Report all concerns/issues to the State Aviation Manager or Regional Aviation Officer as they are discovered or occur.
- ✓ At the conclusion of the assignment a written report will be completed and presented to the local State Aviation Manager or Regional Aviation Officer as well as conducting a "close out" briefing.

- ✓ Perform area inventory of possible *temporary* SEAT bases.
 - Compile a list of each prospective base of operations, listing the location, local contractors and phone numbers, latitude and longitude, length, width, and composition of the landing surface.
 - Provide a list of all the facilities and identifies those that would be available for use by the agency for SEAT operations.
 - Identify restrictions or possible limitations of each site.
- ✓ Provide procurement officer with general information to help them establish agreements with local contractors for water, equipment, and supplies that may be needed for the SEAT operations.
- ✓ Assist the agency personnel with developing agreements or Memorandums of Understanding (MOU) for the use of airports or airstrips. (The SECO does not have the authority to procure any contractors or make any agreement for rental or lease.)
- ✓ Perform an evaluation of the SEMG and the base operations. Offer assistance and recommendations to the SEMG to provide a more efficient and effective base of operations using the *SEAT Base Inspection and Evaluation Form*.
 - Has the authority to “sign off” specific tasks within the guidelines of the SEMG Task Book.
- ✓ Provide assistance to SEMG for completing a contractor performance evaluation of the SEAT pilot and support personnel.
- ✓ Assist agency unit aviation managers with deployment and movement of SEAT resources, including recommending types or resources to be deployed.
- ✓ Identify the capabilities and limitations of the resource that are available for deployment. Receives a briefing from the state or regional level aviation managers on the coordination of SEAT resources involving MAC groups.
- ✓ Assist the using agency with finding available SEMGs and temporarily fill in for SEMGs on their days off when necessary.
- ✓ May act as a liaison for the contractor to help identify and resolve concerns or conflict issues that may surface between the contractor, the SEMG or the using agency. Conflicts or concerns will be documented and reviewed with the Contracting Officer Representative (COR) or the Contract Officer (CO).

- ✓ Compile a comprehensive report on all SEAT operations that were reviewed within their assigned geographical area. The report will contain evaluations of contractor performance, SEAT base operations, SEMG evaluations and the agency's utilization of the SEAT in their fire program.

D. Qualification and Experience Requirements

- ✓ Must be a currently qualified SEMG with a minimum of five (5) years of experience as a SEMG.
- ✓ *Designated and approved to function as a Field SECO by the State/Regional Aviation Manager.*

E. Nomination and Approval Process.

Nominations for the SECO position will be submitted to the *State Aviation Manager or Regional Aviation Officer*. The nomination process requires written documentation of the nominee's fire and aviation background, red-card qualifications, and SEAT experience. Selection for the SECO positions will be based on the individual's field experience, aviation knowledge and program needs.

VI. Geographic Area SEMG Representatives.

A sub group of the SEAT Board, the Geographic SEMGs are the primary interagency point of contact for SEAT related issues on a geographic level. Roles and Responsibilities of this position include:

- ✓ *Serve as the point of contact for SEMGs within the designated GACC.*
- ✓ *Serve as the lead SEMG in representative GACC.*
- ✓ *Assist aviation managers in the coordination of SEMG training in the GACC.*
- ✓ *Assist with placing local SEMG (T) on assignments.*
- ✓ *Disseminate SEMG related information to users at the geographic level.*
- ✓ *Acts as SME as requested.*

CHAPTER 3 – OPERATIONAL PLANNING

I. Introduction.

It is essential that all aviation operations be planned with the utmost consideration given to safety. All SEAT missions can be accomplished safely, provided that a high degree of pre-planning, risk management, and hazard analysis be applied. This chapter will discuss actions that must be taken during the flight planning process; types of missions that SEATs will be asked to perform, and mission specific requirements and responsibilities.

The SEMG is responsible for ensuring that the pilot receives a complete mission briefing prior to departing the SEAT base. Briefings may be given to the SEAT pilot by personnel other than the SEMG, e.g., during divers, radio briefings at remote locations, or when the SEAT is under the operational control of aerial supervision. The SEMG is responsible for documenting the information that was provided to the pilot for a mission briefing on their *SEAT Daily Operations Worksheet* (SEAT-002). The mission briefing will include the following items at a minimum:

- ✓ Lat / Long and/or bearing and distance (elevation, if known)
- ✓ Both AM and FM radio frequencies and contact assigned to the incident (including narrow and wide band programming)
- ✓ Additional aircraft ordered or at the incident
- ✓ Any known aerial hazards and airspace de-confliction concerns

Note: All items for the pilot mission briefing **may be** documented on the *Aircraft Dispatch Form* (NIFC 9400-31). This form was developed as a self duplicating form that allows the SEMG to document critical information needed for a mission briefing and provide the pilot with a carbon copy.

II. General Flight Safety.

During **all** mission flights, *including amphibious aircraft*, the anti-collision strobe lights shall be on while making the retardant drops. The landing lights shall be on while in the fire environment unless prohibited by aircraft limitations.

A. Flight Safety.

The pilot is an essential part of any aviation mission and must be made an integral part of a team effort, whose objective is flight safety and efficiency. The pilot has the authority to refuse any mission or maneuver which compromises flight safety. The pilot will refuse any flight or situation which he/she considers hazardous or unsafe, or may cause the pilot to violate any FAA rules, regulations, or the specifications contained in the contract. Operating an aircraft in violation of any FAA regulations or outside the strict adherence of the

contract specifications will not be tolerated and may be grounds for suspension and/or revocation of the Interagency Pilot Qualifications Card.

B. Situational Awareness.

Loss of situational awareness or “focus” while in command of an aircraft has been responsible for, or factored into, numerous accidents and incidents. It is imperative that the pilot in command remain focused on the overall environment in which he/she is operating. To maintain situational awareness or “focus,” the pilot must evaluate the flight profile and mission environment to include, but not limited to, proximity of obstacles, winds, rate of descent, target location, and terrain features.

C. Minimum Safe Altitudes.

It is critical that fire suppressant materials be placed as accurately as possible on the target areas of the fire. Conditions such as winds, fuels, drop material density, and gate opening shall be considered. In order to achieve greater accuracy, the pilot should, when possible, ascertain from fire officials (Incident Commander, Air Tanker Coordinator, or Air Tactical Group Supervisor) the precise drop location. Adherence to the minimum safe altitudes specified in *14 CFR 91.119* is required unless engaged in actual dispensing operations where the requirements of *14 CFR 137.49* will apply. Drop height adjustments that are made must always be higher than the minimum altitude of 60 feet above the ground cover / canopy. **Except for takeoff and landing, the pilot must maintain at least 60 feet of obstacle clearance at all times.**

III. Types of Flight Missions.

A. Ferry Flight or Repositioning of Aircraft.

This entails the movement of an aircraft from one location to another for the purpose of positioning that aircraft at a specific location or returning the aircraft to its home base. This does not include any mission type flights. Typically, the flight originates at one SEAT base or developed airport, with the flight route being direct to another SEAT base or developed airport. The flight is conducted solely for the purpose of transportation.

B. Initial Attack Missions.

This is the control effort taken by the first resources to arrive at the incident. This is typically the suppression effort that takes place during the first burning period, the initial phase of the suppression effort. Most often this is where the SEAT is sent to a reported fire and begins the suppression activity, often without other aerial resources either assigned or over the fire. The complexity of the air operation during the initial attack phase is generally low, however the initial

attack phase can be the most challenging, as the fire command system is in the building stage and standardization of operating procedures is still to be established.

C. **Extended Attack Missions.**

This is the control effort taken when initial attack activity has been expanded into the second full burning period, or when the initial attack resources assigned were insufficient to suppress the fire. The complexity of the air operation during the extended attack phase is usually higher. There may be several aircraft assigned to the fire organization and the level of supervision will also be higher.

D. **Fire Missions within an Incident Management Team Structure.**

This is the control effort taken when both the Initial Attack and Extended Attack resource capabilities have been exceeded. This phase of the fire suppression effort has the most complex level of air operations, with multiple types of air resources assigned, as well as several layers of supervision. The airborne communication complexity is also increased because of the multiple frequencies required.

E. **Day/Night Flight Limitations.**

SEAT operations are limited to flight during the official daylight hours. Daylight hours are defined as 30 minutes prior to official sunrise until 30 minutes following official sunset, and under visual flight rule conditions. (*FAR part 91.151 through 91.159*). Caution must be taken in mountainous or hilly terrain. One might experience late dawn or early dusk conditions based on terrain features and sun angle, and flight periods should be adjusted accordingly. Daylight hours may be further limited at the discretion of the pilot, aviation manager, ATGS or lead plane because of low visibility conditions caused by smoke, and/or shadows.

F. **Flights Over Congested Areas.**

All SEAT flight operations must comply with the Federal Aviation Regulations concerning flight over congested areas. These are stipulated in *FAR part 91.119(b)* and *FAR part 137.51* and *137.53*. All SEAT missions shall comply with FAR part 91 during all flight operations, except when over the fire itself, then all SEAT operations shall comply with *FAR part 137*. USDA-FS policy, the Airspace Guide, and the BLM Fire Ops Guide all require a lead plane on order for low level retardant operations over congested areas.

G. **Mission Currency Training Flights.**

Mission Currency Training Flights (MCTFs) *should* be conducted every 14 days if no fire missions have been flown in that time period. Transition flights or point-to-point flights do not qualify as “mission” flights. Mission Currency Training Flights should be conducted as an overall training exercise for all aspects of SEAT operations including

the dispatch procedures, loading operations, ramp management, flight operations, flight following, air-to-air and air-to-ground communications. The contractor will be paid for all MCTFs. Units requesting funding for mission currency flights should submit a request to the local aviation manager for approval 2 days prior to mission currency flight. ***If circumstances preclude the government from conducting a MCTF the pilot and aircraft will remain available under the contract and be able to be dispatched.***

H. ***Fire Chemical Use Near Waterways/Sensitive Areas.***

When approaching a waterway (lakes, river, streams, and ponds) visible to the pilot, the pilot shall terminate the application of retardant, water, gel or foam approximately 300 feet before reaching the waterway. When flying over the waterway, the pilot will not begin dropping until 300 feet after crossing the far bank or shore. The pilot shall make adjustments for airspeed and ambient conditions such as wind to avoid dropping within the 300 foot buffer zone. These guidelines do not require the pilot to fly in such a way as to endanger their aircraft, other aircraft, or compromise ground personnel safety. Any deviation from the above requirements must be approved by the local fire manager or aerial supervision. All accidental drops into waterways shall be reported immediately to the aerial supervisor or ground contact if no aerial supervision is available. ***For reporting requirements see Chapter 12 of the Interagency Standards for Fire and Aviation Operations.***

When switching from fire chemicals to water loads, the tank should be rinsed thoroughly before filling with water. Refer to Agency policy.

I. ***Considerations When Using Amphibious Aircraft***

When using amphibious aircraft (Fire Boss), care must be taken to minimize the potential spread of invasive species. Additional guidance and procedures are being created for cleaning of equipment that has been exposed to aquatic invasives. Refer to the Interagency Standards for Fire and Aviation Operations, Chapter 12. Review Base Operations Plan for local direction.

J. ***Required Support Equipment.***

Support equipment will be located at the same base of operations as the SEAT unless otherwise agreed upon beforehand, by both the contractor and the using agency. The SEMG will coordinate the movement and setup of the support equipment.

IV. SEAT Contracting.

SEAT aircraft are to be procured the same way as all other contractor supplied aircraft services. ***All*** federal contracts for SEAT aircraft will be

requested through the regular agency channels and awarded through contract services.

A. **National On-Call Contract.**

The National On-Call contract provides the agencies with a contract to obtain service from a SEAT for a non-specified time frame.

Generally, this contract is used by agencies during high fire activity to provide aerial support for a short duration of time (day by day).

B. **Exclusive Use Contracts.**

Exclusive Use Contracts are those awarded to a vendor for a specified time frame in which the vendor provides exclusive use of its aircraft and support equipment to the government. Request for this type of contracting will be requested through and awarded by OAS.

V. **Placing an Order for a SEAT.**

Placing an order for SEATs will be in compliance with all national and regional mobilization guidelines, using the appropriate dispatching procedures identified in those documents.

SEATs are National Resources ordered and managed at the national level. A National SEAT Coordinator position was developed to help facilitate the ordering and movement of SEAT aircraft and managers. The National SEAT Coordinator works directly with the National Interagency Coordination Center (NICC) on a daily basis.

A. **National On-Call Contract.**

SEAT vendors are listed on a National SEAT Source List under the Geographical Area Coordination Center (GACC) where their home base is located. *Dispatch centers* located within the individual GACCs can place orders for a SEAT *through established ordering procedures* using the National On-Call contract. Orders for vendors not *home based* within the GACC will be processed through the regular channels to NICC.

B. **Exclusive Use:**

Orders for obtaining services from any federal Exclusive Use SEAT already on contract will be placed through the established dispatch channels.

VI. **Preparing for SEAT Operations.**

Well in advance of ordering SEAT aircraft, FMOs and Aviation Managers should use the following checklist to properly prepare for SEAT operations:

A. **Funding.**

Pre-suppression, Suppression, or Severity funding includes:

- ✓ Aircraft Daily Availability

- ✓ Retardant /Gel/ Foam Products
- ✓ Airbase Facilities
- ✓ SEAT Mob / Demob Costs
- ✓ Tanks, Pumps, Fittings, etc.
- ✓ SEAT Manager Salary / Per diem
- ✓ ***Additional SEAT base support personnel Salary/Per diem***
- ✓ Water Source Costs
- ✓ SEAT ***base support personnel*** Vehicles
- ✓ Training / Proficiency Flight Time
- ✓ VHF-AM Radios

B. Facilities.

Designate and develop the base of operations. Monetary or non-monetary agreements may have to be made with City, County, State or private entities. Secure arrangements for the following:

- ✓ Ramp space / Tie downs
- ✓ Retardant Storage / Water
- ✓ Vehicle Parking / Taxi
- ✓ Office / Lounge
- ✓ Phones and Radios
- ✓ Fuel Spills
- ✓ Restrooms
- ✓ Security
- ✓ Garbage

C. Aircraft Management.

Before a SEAT is utilized there must be a trained and qualified SEMG assigned. The SEMG should become part of your organization; they should be supervised by an Aviation Manager, if possible. SEMGs shall be ordered through the established dispatch channels.

D. Operational Planning.

A local SEAT Operations Plan will be developed for all Category I SEAT Bases. For Category II Bases, the SEAT Operations Plan (SEAT-Plan-001) will be completed before operations. The written plan will include at a minimum the elements listed in SEAT Plan-001.

See the SEAT Base Operations Plan example on the BLM SEAT website at:

<http://blm.gov/nifc/st/en/prog/fire/Aviation/Airops/seat.html>.

E. Availability.

The contractor personnel are required to be available a minimum of nine (9) hours each day or as scheduled by the government.

F. Meals.

The contractor personnel need to be prepared to provide their own lunch during normal day to day operations. During high fire activity, the government *may* provide lunch if they deem it necessary. (When the government deems it necessary to provide meals to the contractor aircrew and support personnel, all aircrews and support personnel at that base will be included.)

G. Lodging.

The government, at its option, may provide lodging which may be a remote field or fire camp accommodations.

H. Jettison Areas.

At any time other than required by emergency, SEATs are not to land loaded. The using agency is responsible for designating a jettison area for all SEAT bases. The location of the jettison area will be relayed to the SEAT Manager and the contractor.

I. Process for Returning a SEAT to Contract Availability.

Below is the guidance provided by OAS for returning a SEAT to contract availability for any major repair or alteration that requires an IA (FAA Inspector, airframe) sign off.

Call The OAS inspectors for your region at:

*Atlanta, Georgia: 770-458-7474
(0745-1630, Eastern Time Zone)*

*Boise, Idaho: 208-334-9310
(0745-1630, Mountain Time Zone)*

*Anchorage, Alaska: 907-271-3700
(0745-1630, Alaska Time Zone)*

Regional offices have an afterhours answering service that, upon request, will notify the maintenance inspector.

- ✓ Notify the OAS maintenance inspector of issue leading to unavailability.*
- ✓ Once issues are resolved, contact the OAS maintenance inspector for return to contract availability.*
- ✓ File SAFECOM documenting the maintenance discrepancy and corrective actions.*

CHAPTER 4 – FLIGHT FOLLOWING, RESOURCE TRACKING AND COMMUNICATIONS

I. Introduction.

Flight following, resource tracking, and communications are key elements in promoting aircraft mission safety and efficiency. Flight following, whether performed from a dispatch office or other facility, must be given a high priority by all personnel involved.

The purposes of flight following and resource tracking procedures are to:

- ✓ Ensure the safety and welfare of the flight crew
- ✓ Promote effective utilization of aerial resources and resource tracking
- ✓ Provide information for the administrative processing of aviation related documents.

Pilots, dispatchers, and SEMGs must be knowledgeable in the differences between flight following and resource tracking, and of the different methods and options available to accomplish the task. It is understood that frequently the two intermix (for example, a flight following check-in accomplishes resource tracking, and vice versa).

A. Definition of Flight Following.

Flight following is the knowledge of the aircraft location and condition with a reasonable degree of certainty such that, in the event of mishap, those on board may be rescued quickly.

B. Definition of Resource Tracking.

In order to facilitate cost effective use of aircraft and planning of resources, scheduling offices and ordering offices may request flight status information at designated intervals.

II. Flight Following.

A. Flight Following Requirements.

At the time the flight is planned or during the morning briefings, flight following procedures and requirements should be clearly identified by the dispatcher, unit aviation manager, SEMG, or other responsible party. This individual should identify check-in procedures, including time and locations, dispatch office(s) or other facility involved, individuals responsible for the check-in, frequencies to be used and any special circumstances requiring check-ins.

B. Methods of Flight Following.

There are several methods of flight following, including but not limited to the following:

- ✓ A Visual Flight Rules (VFR) Flight plan with radio check-in to an FAA facility or agency dispatch office at intervals specified. This method is most often utilized for ferry flight/point to point missions.
- ✓ An agency VFR flight plan maintaining contacts at intervals specified in the flight plan, but not to exceed agency minimums.
- ✓ Automated Flight Following (AFF), *an electronic satellite tracking service*, is required in all SEAT contracts.

The SEAT Manager should check with the using agency to see what type(s) of flight following is required or utilized by dispatch.

C. Documentation Required for Flight Following.

The following requirements apply to agency flight following only, and are not applicable to flight following performed through the FAA system.

- ✓ Dispatch flight following log. Flight following from dispatch offices is accomplished utilizing local forms and procedures.
- ✓ Mission Flight following logs. A mission flight following log shall be used for all flight following during fire operations. The SEAT manager or the local fire dispatch office will be responsible for these logs.

D. Flight Following Check-in Facilities

- ✓ FAA flight following. If on an FAA flight plan, check -ins are made with the FAA facility upon departure, while en route, and at the destination.
- ✓ Agency flight following. Check-ins may be made with either the dispatcher or with trained personnel or other aircraft at the fire site (e.g., Air Tactical Group Supervisor, helibase at the fire, Incident Commander, etc.). When field flight following is approved, ground personnel performing the flight following must have contact with dispatch to allow timely reporting of any mishaps, or problems encountered.

E. Flight Following and Resource Tracking Options & Requirements.

- ✓ Check-in requirements differ between point-to-point type flights and mission type flights.
 - Point-to-point/ ferry reposition flights. Check-ins are made at intervals not to exceed 60 minutes, or following FAA VFR flight plan requirements with check-ins at

each stopping point en route and at final destination.

AFF may be used for check-ins.

- Mission flight. ***AFF is the preferred method for mission check-ins*** unless alternative flight-following intervals have been identified in advance for areas of incomplete coverage or due to valid mission requirements. Check-ins will be made at intervals not to exceed fifteen (15) minutes.

- ✓ Check-ins are to be made after takeoff and landing. This is to establish secure communication and to ensure correct frequencies are being used, but should not conflict with sterile cockpit procedures.

F. Check-in Information.

The check-ins made by the pilot for mission flights shall consist of:

- ✓ Current location (geographic location and/or latitude and longitude by GPS are acceptable). Note: National Policy dictates that latitude and longitude be given in degrees, decimal minutes.
- ✓ Current direction of flight. (Use compass heading.)
- ✓ Destination of flight

G. Failure to Meet Check-in Requirements.

The dispatch or other flight following facility will initiate the emergency response procedures for overdue or missing aircraft, ***according to the Interagency Aviation Mishap Response Guide and Checklist (PMS 503/NFES 2659).***

III. Resource Tracking.

On point-to-point/ ferry flights, the dispatcher may require the pilot to make resource tracking check-ins, usually by telephone, at en route stops and at the final destination. Once an aircraft has been released off of a resource order back to the vendor, or it has gone off its exclusive use contract, it is not necessary for the agency to track that aircraft back to the vendor base or other location determined by the vendor. Only if the aircraft is reassigned through the dispatch system, does it need to be tracked and that information passed utilizing the Aircraft Flight Request Form. Information for completion of this form will need to be provided to dispatch by the pilot or SEMG.

IV. Communication Requirements.

It is important that a line of communication be established and maintained throughout the aviation and dispatch organizations. Communications at all levels should be encouraged to resolve situations before they become a problem.

- A. Local units should ensure that the existing communications network is adequate to meet both fire and agency needs. All personnel involved must be furnished and the aircraft must be equipped with sufficient radio capabilities and maps to meet the safety objectives.
- B. The pilot is required to carry **current** sectional aeronautical charts of the area of operations. ***Electronic versions are acceptable.***
- C. All carded aircraft shall be equipped with agency compatible radios, with tone guard capabilities. Tones have been established to reduce interference and allow the selective use of more frequencies. Contracts require that the radios must provide a selection of **digital**, narrowband or wideband channel spacing on each channel.
- D. General considerations. Operations must not be conducted if flight following requirements cannot be maintained. Aircraft with avionics problems that do not allow positive communications must return to the base for repair until the problem is rectified. Also, a review of the Communication plan shall be conducted during the daily briefing, ensuring that all personnel and pilots are aware of frequencies to be used, flight following requirements, and any changes to the operational procedures. Ensure that any problems are brought to the attention of the air operations staff and the communications unit, as well as the local aviation manager.

V. **Incident Communications Plan and Frequencies.**

During complex air operations, there are no standard communication plans that will work for all situations and for all agencies. For this reason, the following is a general discussion of air operations communications in term of function, requirements, options, and radio discipline. On an incident or project, the number of air operational communications functions is dependent upon the complexity of the situation.

A. **SEAT Base RAMP Frequencies.**

This function is commonly called the "base" frequency. This frequency can be used to coordinate the departing and arriving aircraft at the base of operations and direct ramp operations.

Frequencies vary by location. When arriving at a base, verify the local base frequency in use. If no frequency is assigned, one must be requested from the local Dispatch Center.

B. **Air-to-Air Tactical Communications and Frequencies.**

Air-to-Air frequencies are used by all tactical aircraft over the fire during mission flights. The Air Tactical Group Supervisor (ATGS) and the Helicopter Coordinator (HLCO) use this frequency primarily to coordinate aerial activities. On large fire incidents or projects, airplane and helicopters many have separate frequencies. These frequencies will be part of the overall communications plan.

C. **Air-to-Ground Tactical Communications and Frequencies.**

These frequencies are to be used to coordinate aerial activities with the ground activities. All SEATs should have radio compatibility for this function.

D. **Command Communications and Frequencies.**

There is usually only one Command Frequency assigned, although there may be more than one on large complex fire incidents. This function is used to link the Incident Commander with the air operations staff and ATGS. Its use should be limited to "overhead communications" and should not be used for other traffic unless during an emergency.

E. **Air Guard Communications and Frequency.**

Air Guard is a national frequency with specific designated uses, such as emergencies, initial contact at an incident by inbound aircraft, and long range dispatch or rerouting. At no time shall Air Guard be an assigned frequency, nor shall it be used if other frequencies become overloaded, but must be monitored at all times.

F. **Communication Requirements and Options.**

- ✓ Frequency compatibility. It is essential that all aircraft and ground personnel have compatible radios and frequencies in order to perform needed communication functions.
- ✓ Radio Traffic and Radio Discipline. Radio traffic must be disciplined and concise. If problems are encountered with overloaded radio frequencies, first examine whether radio discipline is being practiced. If not, take corrective action with the pilots, aircraft managers, base personnel, and dispatchers. If the frequencies remain overloaded, then additional frequencies will be needed.
 - Use the following guidelines in managing radio traffic:
 - Use clear text on all operations, no CB language.
 - Keep messages brief and to the point.
 - If the message is long, use frequent breaks to allow other or emergency messages to be transmitted.
 - If a frequency has been designated for a specific function, do not allow radio traffic unrelated to this function on the frequency.
 - When making a radio call, identify the radio or frequency on which the message is being transmitted.

Since pilot and ground personnel are monitoring more than one frequency, this will enable them to identify which radio or frequency to use to respond.

- Frequency Monitoring.
Experience has shown that the lesser the number of frequencies that need monitoring, and the fewer the people that the pilot is receiving direction from, the better the pilot will function. Simplifying the amount of frequencies a pilot has to monitoring will increase their immediate environmental awareness and lessen the fatigue factors associated with heavy radio traffic.
- Switching Frequencies.
The necessity to manually switch frequencies will sometimes adversely affect the SEAT pilot. Due to the normal short turnaround times of SEAT operations, frequency changes are a source of distraction, and increase the already heavy workload. The use of AM frequencies should be encouraged whenever possible, as it is easier to change frequencies.
- Combine Functions.
On smaller or less complex incidents, communication functions can be combined. A common method is to combine helicopter air traffic control, air-to-air traffic control, air-to-air tactics, and flight following on one frequency. Command, air-to-ground tactics and support are often combined on another frequency.

The biggest drawback to combining functions is the resultant increase in radio traffic on each frequency, making this option usable only when complexity is very low.

- Air traffic information and Advisories.
Safety is dependent upon adequate air traffic information and advisories being given, and that the information is received and acknowledged. Remember that interpretation can vary. Monitor traffic for compliance.

In most situations the pilot needs to know the following information:

- Which aircraft are affected by the advisory
- What type of traffic (helicopter, fixed-wing)
- What the traffic is doing (turning, climbing, descending)

- Location of the traffic.
- Direction of travel

G. *Sterile Cockpit Environment.*

Sterile cockpit rules apply within a 5-mile radius of the airport and/or after climb checks are complete.

The flight crew (Single and Dual) shall not perform radio or cockpit communications that are not directly related to safe operation of the aircraft. This includes all taxi time to and from the pit until chocked and within a 5 mile radius of the airport. This important phase of Air Tanker operations consist of reading checklists, communication with Air Traffic Control (ATC), Flight Service Stations, Unicom, or other aircraft with the intent of ensuring separation or complying with ATC requirements.

This means communications with Dispatch, Air Tanker Base personnel, ground personnel and other aircraft concerning mission information is prohibited except for essential transmissions. Communication from ground personnel during this time should be limited to safety of flight or mission essential information only.

SEAT bases need to review their established procedures for communicating roll times and alter them as required to ensure that sterile cockpit, as discussed above is maintained. Flight crews will communicate non-essential information, such as roll times, to the departing base following climb checks and when clear of the 5 mile radius.

Refer to Air Tanker Interagency Memo (AIM No. 13-01) regarding Air Tanker Roll Times, Respecting the Sterile Cockpit.

H. *Fire Traffic Area (FTA).*

The FTA was developed by aerial firefighting personnel to provide a standardized initial attack airspace structure to enhance safety, and air traffic separation over wildland fire incidents. Additional training and information about the FTA can be found under Airspace Education on the BLM National Aviation Office Web site at: <http://www.blm.gov/nifc/st/en/prog/fire/Aviation/Airspace.html>

CHAPTER 5 – SEAT AIRCRAFT REQUIREMENTS, CAPABILITIES AND LIMITATIONS

I. Introduction.

It is essential that the SEAT users gain at least a rudimentary knowledge of SEAT capabilities and limitations. The brief summary in this chapter should be supplementary to basic Air operations and safety training that provides further specific information concerning SEAT limitations and operating characteristics. SEAT users and SEMGs alike are encouraged to enhance their knowledge and understanding of SEAT operational capabilities by conferring with the individual most qualified— the pilot.

II. SEAT Aircraft Performance Standards.

The performance of each particular airplane will vary by aircraft type. They range from carrying **500** gallons of retardant/suppressant to the ability to carry 800 gallons of retardant/suppressant. The speeds of these aircraft will also vary depending on aircraft type and the amount of load being carried. The aircraft may be slower when loaded depending on atmospheric conditions. They range in cruise speeds from 100 mph to 200 mph. However the majority of SEATs have a cruise speed around 145-165 mph.

Each SEAT will be required by contract to have special purpose load capacity charts generated for that specific aircraft, available to the pilot in the cockpit.

A. Wind and Turbulence Limitations for SEAT Operations.

Because of conditions normally encountered during fire suppression activities, it is important to consider safe and effective aerial operating parameters, when windy and/or gusty conditions are present. Additional caution should be taken when operating in wind conditions above 20 knots, or when wind gust spread exceeds 10 knots. **SEAT operations shall cease when the SEAT pilot, Aerial Supervisor, or Lead plane has been notified that there are sustained winds greater than 30 knots at the fire operations area, or that the wind gust spread exceeds 15 knots in the fire operations area.** This does not prevent a decision to cease operations when any unsafe or inefficient conditions are present. This limitation in no way supersedes any aircraft or pilot operational restrictions.

III. Aircraft Equipment, Communications and Instrument Requirements.

All SEAT aircraft shall have either a standard or a restricted category airworthiness certificate, and be equipped with all fire-fighting equipment

as specified in the contract. *Refer to the procurement document for specifics (located on the OAS website at: <http://oas.doi.gov>).*

IV. Tank and Gate Requirements and Standards.

Tank capacities and drop gate configurations vary with make and model and between individual contractor's equipment. The volumes range from 500 to 800 gallons. The following requirements are common to all SEATs, regardless of make, model, or release mechanism:

Tank/Hopper

- ✓ Tank/Gate systems should not leak when loaded at the interagency carded permissible loads (gallons in the hopper).
- ✓ Tank (hopper) quantity indicators shall be visible to the loading crew and pilot.

Gate/ Drop Door

- ✓ Gate must be re-closable in flight (as opposed to manually resetting the door on the ground after a single-shot salvo drop).
- ✓ Gates must be capable of salvo drops as well as split drops.
- ✓ All systems must have an emergency dump feature that enables the pilot to drop the load in less than 6 seconds by using the normal dump handle in a single, one-step operation.

Hopper/Tank Venting

- ✓ The tank must be properly vented to insure against negative pressures developing within the tank, resulting in cavitation and non-uniform flows. Vents may be top mounted, spring loaded doors, which are vacuum operated, venturi or positive pressure scoop type vents, or mechanically operated vents which deploy in relation to the gate opening. There should be no routine leakage of water or retardant or slop over from the vent areas. Internal anti-slosh baffle plates are acceptable.

V. SEAT Aircraft Markings.

Historically, SEATs are called on to operate at low level and in an environment that is filled with smoke; therefore it is imperative that the aircraft itself be highly visible and easily identified. The miscellaneous SEAT contracts specify the aircraft paint schemes, identification stripes and tanker number specifications.

Because of the growing number of SEATs that qualify as Type 3 air tankers the numbering system for SEATs will be as follows:

All SEATs that qualify as Type 4 SEATs will continue to be issued air tanker designation numbers and call signs starting at 400 and ending with 499.

INTERAGENCY SINGLE ENGINE AIR TANKER OPERATIONS GUIDE

All SEATs that qualify as Type 3 SEATs will be issued air tanker designation numbers and call signs starting at 800 and ending with 899.

The numbers are painted on the aircraft as spelled out in the contract specifications.

CHAPTER 6 – SEAT BASES AND LANDING AREAS

I. Introduction.

To realize the full economic and operational effectiveness of SEATs and to optimize their self-sufficient capabilities, SEAT flight operations should be established as close to the incident as possible using available *airports*. Therefore it is crucial that the user be familiar with the operational limitations of these types of aircraft.

II. Planning.

The responsibility for planning the most efficient use of SEATs falls directly on the aviation management of the user agency. SEATs are very versatile, and can be used from a wide variety of aviation facilities. The using agency should conduct pre-planning efforts that include identifying suitable landing sites and operational areas that will promote effective use of the SEAT. Agreements and operational plans should be developed for these sites prior to fire season. Some of the criteria that can be used in choosing these sites can be:

- ✓ Facilities located in areas with historically high fire occurrences.
- ✓ Locations that allow rapid movement of support equipment.
- ✓ Locations that are close to a water source and aviation fuel.
- ✓ Locations that can be easily accessed for providing logistical support.
- ✓ Areas that have good communications established.
- ✓ Facilities that are not subjected to high public use.
- ✓ Flight paths over congested areas are minimized.
- ✓ Locations that can expand to meet the incident's needs.
- ✓ Locations that will help facilitate any security needs.
- ✓ Locations that will accommodate aircraft size, type or performance.

III. Operations from established Air Tanker Bases.

SEATs may operate from the same facility as large air tankers. The SEAT Contractor must receive a complete briefing from the ATBM prior to conducting operations from an established Air Tanker Base.

IV. Operations from *Established bases and Airports*.

The best utilization of SEATs requires that they be placed close *to forecasted and current fire activity*. This may best be accomplished by placing the SEAT operation at the nearest airport. Coordination with the local airport manager is crucial to the safe and efficient operation of this resource. It is the responsibility of the local aviation manager along with the SEMG to establish a working relationship with the airport manager. The procurement section of the user agency will be required to set up rental agreements and payment schedules. The SEMG will be responsible for the set up and day to day safe and efficient operation of the SEAT base. Local

airports are best for these operations because of the ease of maintaining logistical support, and the close proximity of aviation fuel, as well as the known runway capability.

SEATs may re-load out of an established SEAT base without the presence of a SEMG providing the following requirements are complied with:

- ✓ ***SEMG and support personnel are en route to the base.***
- ✓ Must have a direct communication link with the incident or the dispatch organization at all times.
- ✓ Hot loading the aircraft will not be permitted.
- ✓ No more than three SEATS are using the site to re-load.
- ✓ No more than one SEAT is allowed in the pit area at a time.

V. **SEAT Base Categories.**

SEAT bases will be identified by the following categories:

Category I Bases

Any Large Air Tanker Base or SEAT Base with an established full service, bulk or BPA retardant contract that is published in the Interagency Air Tanker Base Directory. Personnel are either permanently assigned or placed on an on-call status to immediately support SEAT operations. Equipment and retardant are on site year-round. All Category I Bases will meet the standards identified in the SEAT Base Checklist(s).

Category II Bases

Airports that have been identified as capable of supporting SEAT operations and will support parking mobile loading equipment for a limited time frame on a call-when-needed basis. Appropriate agreements are in place with hosting airport authority. Personnel are assigned to the base as needed to support short term SEAT operations. A water supply may be identified and available.

VI. **Required Elements for SEAT Bases.**

No matter what category of base or locations SEATs are operated from, the following **minimum** standards are required for each base:

- ✓ The using agency must ensure the appropriate arrangements have been made for using the ramp space and any facilities at the SEAT base.
- ✓ The SEAT Manager must be provided with a complete briefing about the base location and operational procedures by the using agency.
- ✓ A crash rescue plan must be identified or developed for the SEAT base.
- ✓ The SEMG must be briefed on the agency's procedures established for hazardous materials spills for the base.

- ✓ A *Risk Management Worksheet* (RMW) or *Job Hazard Analysis* (JHA) must be available to the SEMG to review and use at the site.
- ✓ Adequate facilities and logistical support must be in place to ensure the welfare and safety of all personnel assigned to the base.
- ✓ An assessment of security concerns must be made by the using agency.
- ✓ A jettison area must be designated for the base.
- ✓ A VHF-AM radio must be available for monitoring the ramp frequency.
- ✓ An adequate method must be established for providing the SEMG with daily intelligence used for briefing pilots.
- ✓ Prior to a SEAT base becoming operational; a current and up to date SEAT Base Operating Plan must be completed.

VII. SEAT Base Operating Plan.

A *SEAT Base Operating Plan* (SEAT-Plan-001) is required for Category I/II SEAT bases. The plan must be updated annually and made available to all personnel at the base. The SEMG will ensure the operating plan is current during the time frame they are assigned to the base. A blank *SEAT-Plan-001* form can be found on the BLM National SEAT Web Site at: <http://www.blm.gov/nifc/st/en/prog/fire/Aviation/Airops/seat.html>

VIII. SEAT Base Security.

A. Aircraft Security.

The SEAT pilot is responsible for the security of their aircraft, vehicles and associated equipment used in SEAT operations. SEATs are required by contract to be physically secured via a dual-lock method whenever the aircraft is unattended. The contract outlines the type of acceptable locking devices and methods that can be utilized by the contractor.

SEMGs should remind the contractor to engage their security devices when the SEAT is unattended.

B. SEAT Base Facilities.

The using agency is responsible for ensuring the proper level of risk assessment has been made for utilizing the facilities as a SEAT base. The SEMG is responsible for report any acts or situations that they perceive as a possible security threat to the base.

CHAPTER 7 – PERSONAL PROTECTIVE EQUIPMENT REQUIREMENTS

Contractor personnel are required to have Personal Protective Equipment during fire operations. Refer to the procurement document for specifications.

I. Ramp Operations Personal Protective Equipment

- ✓ *Shoes may not be open toed and should have a non slip sole. No flip flops or sandals. Recommend tennis shoes or hiking type boots.*
- ✓ *Appropriate hearing and eye protection must be worn when working around aircraft with engine or propeller running.*
- ✓ *It is recommended that eye and ear protection be worn when in proximity of running pumps or other loud noise-making equipment.*
- ✓ *Personnel working on the ramp should wear high visibility clothing or vests.*

CHAPTER 8 – SEAT LOADING AND REFUELING

I. Introduction.

Unless otherwise specified by contractual agreement, all loading and refueling operations are the sole responsibility of the contractor. However, there may be times when the SEAT is to be loaded with fire retardants or suppressants at an established air tanker base or SEAT base. (*Units utilizing agency personnel as RTCM/MXMS must be approved by the local Aviation Officer and State Aviation or Regional Officer prior to operations*). All personnel authorized for loading operations, shall be fully trained and qualified in the procedures established at each base prior to operations. (*See Appendix A for training curriculum for SEAT base support positions found on the BLM SEAT website at: <http://www.blm.gov/nifc/st/en/prog/fire/Aviation/Airops/seat.html>.*)

All SEATs are approved for "Hot" reloading, however, the SEAT Contractor must comply with the procedures established at all bases. These procedures may or may not allow "hot" reloading.

The contractor *or qualified agency personnel are* required to verify compliance with retardant manufacturer's specification prior to induction into the aircraft. The SEMG will be supplied with the results of the refractometer readings for their records. SEMGs will conduct periodical quality assurance checks. When operating from a Large Air Tanker Base, the ATBM is responsible for ensuring that the loading personnel meet this requirement. The *ATBM (or SEMG if assigned)* will be responsible for ensuring this documentation is given to the SEAT contractor for their records.

The pilot will supervise the retardant contractor or other *qualified* personnel during the entire loading operation.

II. Single Engine Air Tanker Hot Loading/Fueling.

A. Purpose.

Reduce loading times, establish safe and efficient refueling procedures and to prevent adverse impacts on the aircraft systems.

B. Objectives.

The objective of this section is to provide safe and efficient procedures for loading SEATs with fire retardant or suppressant without shutting down the aircraft engine.

C. Definition.

Hot loading is loading an aircraft with fire retardant or suppressant while the engine is running. Hot refueling is fueling the aircraft while

the engine is running. An aircraft shall not be refueled while the engine is running or propellers turning unless the aircraft is equipped with an appropriate dry-break refueling system.

D. Responsibility.

Unless otherwise specified by contract, the fueling operations are the sole responsibility of the contractor and will not be performed by government personnel. Each SEMG or ATBM is responsible for overseeing compliance with established procedures, ensuring safe and efficient fueling and loading operations.

E. Site Specific Loading/Fueling Procedures.

Some air tanker bases and other localities have policies prohibiting one or more of these procedures. In those cases, comply with the local agency policy.

THERE SHALL BE NO SIMULTANEOUS HOT LOADING AND FUELING

III. Hot Loading Procedures.

A. Initial Arrival Procedures.

For the purposes of hot loading, when a SEAT first arrives at a base for an incident, the SEAT pilot shall receive a briefing which covers the following procedures with the base manager:

- ✓ Ramp traffic flow procedures
- ✓ Hot loading/fueling procedures (*including hand signals, aircraft valve operation*)
- ✓ *Verify how much retardant should be loaded*
- ✓ *Pump speed (GPM)*
- ✓ Base communication procedures
- ✓ Emergency procedures
- ✓ Basic safety procedures
- ✓ *Jettison area(s)*

This briefing can occur either over the radio with engine in idle or in person after the aircraft has been shutdown. This should be outlined in the local base operating plan.

If the SEAT has just been hired, initial inspection and briefing procedures must occur prior to operations being conducted.

B. Ramp Procedures.

- ✓ Prior to entering the loading area the pilot will contact the *SEMG (or RAMP when available)* on the designated base frequency to ensure that the loading area is clear before the aircraft is directed to approach the assigned loading pit.

- ✓ Once in the loading pit the pilot will stop the aircraft and put the engine at idle and lock the brakes
- ✓ When the pilot has secured the aircraft, he will inform the base by radio or use the air tanker operations hand signal.
- ✓ ***The retardant loaders and fuelers will remain clear of the loading area until signaled by the pilot (or SEMG/RAMP/FWPT) that it is safe to approach the aircraft.***
- ✓ The ***SEMG/RAMP/FWPT*** will position himself at all times to allow a clear view of the pilot, aircraft propeller, loaders and fuelers. The ***SEMG/RAMP/FWPT*** shall remain in communication with the pilot at all times through radio contact or hand signals.
- ✓ If ***any hazardous situation is developing***, the ***SEMG/RAMP/FWPT*** shall ***communicate to*** the pilot to shut down the aircraft engine immediately.

C. **Retardant/Suppressant Loading Procedures.**

- ✓ **ALL HOT LOADING OPERATIONS MUST COMPLY WITH THE FOLLOWING:**
- ✓ The ***SEMG/RAMP/FWPT*** and the pilot shall remain in contact with each other by radio or hand signals throughout the loading and refueling operations.
- ✓ Loaders will approach and depart the aircraft only in the safety area behind the trailing edge of the front wing. All loading and refueling operations must be conducted in this safety area.
- ✓ The ***SEMG/RAMP/FWPT*** shall keep the loading area secure from any unauthorized personnel.
- ✓ The pilot will signal the loader to shut off the pump when the aircraft has been loaded to the desired level. The loader will then disconnect the hose and pull it back away from the loading area.

IV. **Refueling SEAT Aircraft.**

A. ***Refueling operations are the sole responsibility of the contractor and will not be performed by government personnel.***

- ✓ ***Some SEATs are approved for "Hot" refueling provided the appropriate dry-break equipment is installed and approved fueling procedures are followed. All fueling operations are to be conducted in a secure area, and without presenting any undue hazard to other aircraft or personnel.***
- ✓ ***"Hot" refueling is only allowed to be performed if the base operation plans approve the operation. The SEAT Contractor must comply with the base operational plans.***
- ✓ ***"Hot" refueling, if allowed, can only be performed by the SEAT Contractor's personnel and equipment.***
- ✓ The pilot shall remain at the controls of the aircraft during all hot fueling and hot loading operations.
- ✓ Bonding procedures shall be followed by all fueling personnel.

- ✓ When the loading and fueling operations are complete, the **SEMG/RAMP/FWPT** shall notify the pilot by radio or hand signals that the loading and refueling crew and their equipment are clear of the aircraft. The pilot will then be cleared and directed from the pit area by the **SEMG/RAMP/FWPT**.

A. Emergency Procedures

In case of any type of emergency situation, the **SEMG/RAMP/FWPT** will notify the pilot by radio or hand signals of the type of emergency.

- ✓ Fire. In the event of a fire, the **SEMG/RAMP/FWPT** will immediately notify the pilot, loaders and fuelers by radio or using hand signals. Fire extinguisher will be manned for pilot protection and appropriate base procedures will be followed.
- ✓ Communication Loss. If radio communications are lost, the **SEMG/RAMP/FWPT** will establish eye contact with the pilot and pat the ear phones followed by a thumbs-down signal. Loading and/or fueling operations may continue, using hand signals, until the radio problem has been identified and corrected.
- ✓ Engine Shutdown. In the event that any situation requiring engine shut down occurs, the **SEMG/RAMP/FWPT** will notify the pilot by radio or hand signal drawing the index finger across the throat. The pilot will immediately shut down the engine.

B. General Precautions.

- ✓ Always maintain communication with the pilot by radio or hand signals.
- ✓ Only authorized personnel shall perform aircraft fueling and loading operations.
- ✓ Only essential personnel shall be allowed in the loading and fueling area during these procedures
- ✓ All personnel must obtain permission from the pilot prior to approaching the aircraft while it is running.
- ✓ All operations shall remain within the safety area.
- ✓ Review and update all base fire emergency procedures.

GLOSSARY

- A -

Abort: To terminate a preplanned aircraft maneuver.

Adapter: A hose-coupling device for connecting hose threads of the same size.

After Action Review (AAR): A review process that looks at the planning, execution, and closeout of an incident. The AAR helps identify the strengths and weakness of the incident to provide lessons learned for future planning and execution.

Agency dispatcher: Dispatch organization for the agency with primary jurisdictional responsibility.

AGL: Above ground level.

Air Attack: The ICS identifier for the Air Tactical Group Supervisor (ATGS).

AIR TAC: This term also refers to the Air to Air Frequency used by Air Resources on the incident to talk to each other.

Air tanker: Any of four ICS size classes of fixed-wing aircraft capable of transport and delivery of fire suppressant or retardant materials.

Allocated resources: Resources which are dispatched to an incident but have not yet checked in.

Ambient air: The air of the surrounding environment.

Anchor point: An advantageous location, usually a barrier to fire spread, from which to start constructing fireline. This is used to minimize the chance of being flanked by the fire while the line is being constructed.

Application rate: The total volume of liquid or mass of material applied per unit area based on the output rate of the applicator and the area covered per unit time.

Area ignition: The ignition of individual fires either simultaneously or in quick succession, spaced to influence and support each other to produce a fast, hot fire spread.

ASD: Acquisition Services Directorate

Aspect: The direction a slope faces the sun, expressed in cardinal direction. Same as exposure.

Assigned resources: Resources checked in and assigned work tasks on an incident.

ATBM: (*Air Tanker Base Manger*) is a technical specialist functioning under coordination and support. See IABOG for list of duties.

ATIM: (*Aircraft Timekeeper*) is a technical specialist position. The ATIM may report to the ATBM or FWBM or SEMG at a Seat Base. See IABOG for list of duties.

Automated Flight Following (AFF)—an electronic satellite tracking service used by many aircraft to show current position. Required in all Federal government aviation contracts.

Avoidance Area: an area where the use of fire chemicals (retardant, foam, gel) is restricted due to the presence of waterways (aquatic avoidance area) or species of environmental concern (terrestrial avoidance area).

- B -

Back-burn: Used in some localities to specify fire set to spread against the wind in prescribed burning. Also called a **backing fire**.

Backfire: (1) Fire set along the inner edge of a fire control line to stop a spreading wildfire by reducing the fuel or changing the direction of force of the fire's convection column. The term applies best where skilled techniques are required for successful execution. Using such fire to consume unburned fuel inside the fireline to speed up line holding and mop-up is usually called burning out or clean burning. (2) A prescribed fire set to burn against the wind.

Barrier: Any obstruction to the spread of fire. Typically, an area or strip devoid of flammable fuel.

Base (flight pattern): A flight path at right angles to the landing runway or target off its approach end.

Black line: Fuel between the fireline and the fire that has been burned out. Line is not complete until fuel is burned out between fireline and fire or no unburned fuels (vegetation) between the fireline and the fires edge.

Blowup: Sudden increase in fire intensity or rate of spread sufficient to preclude direct control or to upset existing control plans. Often accompanied by violent convection and may have other characteristics of a firestorm.

Branch: The organizational level directing two or more divisions; organizationally between the Operations Section Chief and the Division/Group Supervisors.

Break left/right: Turn left/right. Applies to aircraft in flight, usually on the drop run and when given as a command to the pilot; implies immediate compliance, e.g., “Tanker 75, break right; a small plane is crossing the target.”

Burning conditions: The state of the combined factors of environment that affect fire in a given fuel association.

Burning index: A number related to the contribution that fire behavior makes to the amount of effort needed to contain a fire in a particular fuel type within a rating area. This is an index for describing fire danger.

Burning out: Setting fire inside a control line to consume fuel between the edge of the fire and the control line (see backfire).

Burning period: That part of each 24-hour period when fires will spread most rapidly, normally between 10 a.m. and 6 p.m.

- C -

Canopy: The stratum containing the crowns of the tallest vegetation present (living and dead), usually above 20 feet.

Cardinal points: The four chief points of the compass -- north, south, east and west.

Clock method: A means of establishing a target or point by reference to clock directions where the nose of the aircraft is 12 o'clock, moving clockwise to the tail at 6 o'clock, e.g., “The target is at your 9 o'clock position.”

Concentration: The amount of the substance contained per unit volume of a liquid.

Congested area: An FAA term for an area where aviation operations conducted at low-level altitudes may result in damage to property or injury to ground personnel, e.g., buildings or dwellings, recreational sites, transportation corridors, industrial properties, assemblies of persons, communications facilities, transmission lines, water resources, etc.

Coverage level: A figure representing the number of gallons of retardant mixture dropped, or prescribed, to cover fuels in a 100-square-foot area.

Crosswind (flight pattern): A flight path at right angles to the landing runway or target off its upwind or departure end.

Cup trench: A ditch dug on a slope below a fire, designed to catch rolling burning material.

- D -

Delayed attack fire: A fire which due to its lower priority and/or unavailability of resources will not be staffed for several hours or possibly several days.

Direct attack: Any treatment applied directly to a burning fuel such as wetting, cooling, smothering or chemically quenching the fire or by physically separating the fire from the unburned fuel.

Discovery: Determination that a fire exists; the location may or may not be verified.

Dispatch center: A facility from which resources are directly assigned to an incident.

Dispatcher: A person, who receives reports of discovery and status of fires, confirms their location, takes action promptly to provide the people and equipment likely to be needed for control in the first attack and sends them to the proper place.

Divert: Change in aircraft assignment from one target to another or to a new incident.

Division: A unit established to divide an incident into geographical areas of operations.

Downwind (flight pattern): A flight path parallel to the landing runway or target in a direction opposite to the landing or drop area.

Dozer line: Fireline constructed by a bulldozer.

Drop: That which is dropped in a cargo dropping, or retardant, water/foam dropping operation.

Drop configuration: The type air tanker/helitanker drop selected to cover the target, based on door/tank system and how the doors and compartments are sequenced to open/close (see salvo, split load and trail).

Drop zone: The area around and immediately above the target to be dropped on.

Drought index: A number representing net effect of evaporation, transpiration and precipitation in producing cumulative moisture depletion in deep duff or upper soil layers. The Palmer Drought Index is the most widely used.

Dry lightning storm: A lightning storm with negligible precipitation reaching the ground.

Dry run: A flight made on the flight route above the “live drop” altitude but without making a drop.

Duff: The partly decomposed organic material of the forest floor beneath the litter of freshly fallen twigs, needles and leaves.

- E -

Early: A drop that was early or short of the target, e.g., “You were early on the last drop.”

Edge firing: A technique of broadcast burning in which fires are set along the edges of an area and allowed to spread to the center.

Engine: Any ground vehicle providing specified levels of pumping, water and hose capacity.

Escape route: A route of travel known to all that leads away from the point of danger, generally to a safety zone. It should be preplanned.

Escaped fire: A fire which has exceeded initial attack capabilities.

Exit: Flight route away from an operations area or a command used to indicate the direction the Air Tanker Coordinator wants the pilot to fly after a given maneuver, e.g., “Exit southbound over the lake.”

Exposure: Property that may be endangered by a fire in another structure or by a wildfire.

Extend: To drop retardant in such a way that the load slightly overlaps and lengthens a previous drop, e.g., “Extend the last drop.”

Extra-period fire: A fire not controlled by 10 a.m. of the day following discovery.

- F -

False alarm: A reported smoke or fire requiring no suppression; e.g., brush burning under control, mill smoke, false smoke, etc.

Final (flight pattern): A flight path in the direction of a landing or drop (short for final approach).

Fire behavior: The manner in which a fire reacts to the variables of fuel, weather and topography.

Fire cooperator: A fire-trained local person or agency who has agreed in advance to perform specified fire control services.

Fire danger: Resultant of both constant and variable fire danger factors which affect ignition spread, difficulty of control of fires and the damage they cause.

Fire danger rating: A fire management system that integrates the effects of selected fire danger factors into one or more qualitative or numerical indices of current protection needs.

Fire effects: The physical, biological and ecological impact of fire on the environment. **Fine fuel moisture:** The probable moisture content of fast-drying fuels which have a time lag constant of one hour or less, i.e., grass, leaves and small twigs.

Fireline: The part of a control line that is scraped or dug to mineral soil; sometimes called **fire trail**.

Fire management: All activities required for the protection of burnable forest values from fire, and the use of fire to meet land management goals and objectives.

Fire perimeter: The fire boundary at a given moment.

Fire progress map: A map maintained to show at given times the location of the fire, deployment of suppression forces and progress of suppression.

Fire retardant: Any substance except plain water that by chemical or physical action reduces flammability of fuels or slows their rate of combustion.

Fire review: Process of analyzing the fire management action on a given unit or the specific action taken on a given fire to identify reasons for both good and poor results and recommend ways of doing a more effective job.

Fire scar: (1) A healing or healed injury or wound caused or accentuated by fire on a woody plant. (2) The scar made on a landscape by fire.

Fire season: The period(s) of the year during which fires are likely to occur, spread and do sufficient damage to warrant organized fire control.

Fire shelter: An aluminized, heat reflective, firefighters personal protective pup tent used in fire entrapment situations.

Firestorm: Violent convection caused by a large continuous area of intense fire. Often characterized by destructively violent surface in-drafts beyond the perimeter and sometimes by tornado-like whirlwinds.

Fire suppression organization: (1) The management structure designed to enable carrying out line and staff duties of the incident commander with increases in size and complexity of the suppression. (2) All supervisory and facilitating personnel assigned to fire suppression duty under the direction of an incident commander.

Fire tool cache: A supply of tools and equipment assembled in planned quantities or standard units at a strategic point for fire suppression use.

Fire Traffic Area (FTA): The FTA was developed by aerial firefighting personnel to provide a standardized initial attack airspace structure to enhance safety, and air traffic separation over wildland fire incidents.**Fire weather forecast:** A weather prediction specially prepared for wildland fire control.

Fire weather station: A meteorological station specially equipped to measure weather elements that have an important effect on fire control.

Firing out: The act of setting fire to fuels between the control line and the main fire in burning out operations; also called **burning out**.

Fixed tank: A tank mounted inside or directly under an aircraft which contains water or retardant for dropping on a fire.

Flammability: The relative ease with which fuels ignite and burn, regardless of fuel quantity.

Flank fire: A fire set along a control line parallel to the wind and allowed to spread at right angles.

Flare up: Any sudden acceleration of fire spread or intensification of the fire. Unlike blowup, a flare up is of relatively short duration and does not radically change existing control plans.

Flash fuels: Fuels such as grass, leaves, dropped pine needles, fern, tree moss and some kinds of slash which ignite readily and are consumed rapidly when dry; also called fine fuels.

Flash over: Rapid combustion and/or explosion of unburned gasses trapped at some distance from the main fire front; usually occurs in poorly ventilated topography.

Flow rate: The rate of dispensing liquid, measured in gallons or liters per minute, or similar terms.

FM (Fox-Mike): See VHF-FM.

Foam: A fire-extinguishing chemical that forms bubbles when mixed with water, it adheres to the fuel and reduces combustion by cooling, moistening and excluding oxygen.

Free-burning: The condition of a fire or part of a fire unchecked by natural barriers or control measures.

Friction loss: Resistance to flow of liquids (usually water) through hose and appliance.

FTA: Fire Traffic Area developed by aerial firefighting personnel to provide a standardized airspace structure to enhance air traffic separation over wildland fire (or other) incidents.

Fuel break system: A series of modified strips or blocks tied together to form strategically located fuel breaks around land units.

Fuel moisture content: The quantity of moisture in fuel; expressed as a percentage of the weight when thoroughly dried at 212 degrees F.

Fuel-moisture-indicator stick: A specially prepared stick or set of sticks of known dry weight continuously exposed to the weather and periodically weighed to determine changes in moisture content as an indication of moisture changes in forest fuels.

Fuel tender: Any vehicle capable of supplying fuel to ground or airborne equipment.

Fuel type: An identifiable association of fuel elements of distinctive species, form, size, arrangement or other characteristics that will cause a predictable rate of fire spread or difficulty of control under specified weather conditions.

Fuel type classifications: The division of wildland areas into fire hazard classes.

Fugitive retardant: A clear retardant without iron oxide (red color agent) or a retardant with a red color agent that fades or becomes invisible after several days of exposure to ultraviolet sun rays.

FWBM: (Fixed Wing Base Manager) is a technical specialist functioning under Air Operations. The FWBM reports to the ATBM, Aviation Officer, Dispatch Center, or Incident Air Operations as appropriate. See IABOG for list of duties.

FWPT: (Fixed Wing Parking Tender) is a technical specialist functioning under air operations. The FWPT reports to the RAMP or SEMG at a Seat Base. See IABOG for list of duties.

- G -

General staff: The group of incident management personnel composed of an Operations Section Chief, a Planning Section Chief, a Logistics Section Chief and a Finance Chief.

GPS: Global Positioning System.

Ground fire: Fire that consumes the organic material beneath the surface ground litter, e.g., a peat fire.

- H -

Hand crew: Individuals organized, trained and supervised principally for operational assignments on an incident.

Hand line: Line constructed using hand tools.

Hazard: A fuel complex defined by kind, arrangement, volume, condition and location that forms a special threat of ignition or of suppression difficulty.

Hazard reduction: Any treatment of a hazard that reduces the threat of ignition and spread of fire.

Head: Pressure due to elevation of water, it equals 0.433 pounds per square inch (PSI) of elevation; also called back pressure.

Head fire: A fire spreading or set to spread with the wind.

Head of the fire: A “running edge” of the fire, usually spreading with the greatest speed, driven by the wind or topography. It is not uncommon to have two or more heads on a fire.

Heavy fuels: Fuels of large diameter, e.g., snags, logs and large limbs, which ignite and are consumed more slowly than flash fuels; also called **coarse fuels**.

Heel (of a fire): The part of the fire perimeter opposite the head (see origin).

HLCO (“hel-co”): Call sign identifier of the Helicopter Coordinator.

Held line: All worked control line that still contains the fire when mop-up is completed; excludes lost line, natural barriers not backfired and unused secondary lines.

Helibase: The main location within the general incident area for parking, fueling, maintenance and loading of helicopters; usually at or near the incident base.

Helibase crew: A crew of individuals who may be assigned to support helicopter operations.

Helicopter tender: A ground service vehicle capable of supplying fuel and support equipment to helicopters.

Helispot: A temporary landing spot for helicopters.

Helitack foreman: A supervisory firefighter trained in the tactical and logistical use of helicopters for fire suppression.

Helitanker: A helicopter equipped with a fixed tank or a suspended bucket-type container used for aerial delivery of water or retardants.

Hold (holding area): A predetermined maneuver (race track pattern) which keeps aircraft within a specified airspace while awaiting further directions from the air traffic controller.

Holding action: Use of an aerial application to reduce fire intensity and fire spread until ground resources arrive; common with delayed attack fires.

Holdover fire: A fire that remains dormant for a considerable time; also **sleepers**.

Hopper capacity: Usable full capacity of the hopper in U.S. gallons.

Hose lay: Arrangement of connected lengths of fire hose and accessories on the ground beginning at the first pumping unit and ending at the point of water delivery.

Hot line: Line with active fire along it.

Hotshot crew: A highly trained firefighting crew used primarily in hand line construction.

Hot spotting: Checking the spread of fire at points of rapid spread or special threat; usually the initial step in prompt control with emphasis on first priorities.

- I -

IABOG: Interagency Air Tanker Base Operations Guide. This term is also referred to as IATBOG.

Incendiary fire: A fire willfully set by anyone to burn vegetation or property not owned or controlled by that person and without consent of the owner.

Incident: An occurrence or event, either human-caused or a natural phenomenon, that requires action by emergency service personnel to prevent or minimize loss of life or damage to property and/or natural resources.

Incident action plan: Objectives reflecting the overall incident strategy and specific control actions for the next operational period.

Incident base: Where the primary logistics functions are coordinated and administered; there is only one base per incident.

Incident command post (ICP): Where the primary command functions are executed; usually collocated with the incident base.

Incident command system (ICS): The combination of facilities, equipment, personnel, procedures, and communications operating with a common organizational structure, with responsibility for the management of assigned resources to effectively accomplish stated objectives pertaining to an incident.

Independent action: Suppression action by other than the regular fire control organization or cooperators.

Indirect attack: Control line along natural or human-made firebreaks, favorable breaks in topography or at a considerable distance from the fire perimeter.

Indirect line: A method of suppression in which the control line is a considerable distance from the fire and intervening fuel is burned out.

Infrared (IR): A heat detection system used for fire detection, mapping and hot spot identification.

Initial attack (initial action): Control efforts taken by the first resources to arrive at the incident.

- J -

Jurisdictional agency: The agency having jurisdiction and responsibility for a specific geographical area.

- L -

Late: Indicating that a drop was late or overshot the target, e.g., “You were late on the last drop.”

Lead plane: Aircraft which flies trial runs over the fire and directs the tactical deployment of air tankers.

Leapfrog method: A system of organizing workers in fire suppression in which each crewmember is assigned a specific task, e.g., clearing or digging fireline on a specific section of the control line, and when that task is completed, passes other workers in moving to a new assignment.

Light burning: Periodic broadcast burning to prevent fuel accumulation in quantities that would cause excessive damage or difficult suppression in case of accidental fires.

Lightning fire: A fire caused directly or indirectly by lightning.

Litter: The top layer of the forest floor, composed of loose debris of dead sticks, branches, twigs and recently fallen leaves or needles; it is little altered in structure by decomposition.

Live burning: Progressive burning of green slash as it is cut.

Live run: A flight over the drop area in which a discharge of cargo or retardant/water, etc. will be made.

Lookout: (1) A person designated to detect and report fires from a vantage point. (2) A location from which fires can be detected and reported. (3) A fire crewmember assigned to observe the fire and warn the crew when there is danger of becoming trapped.

Low pass: Low-altitude run over the target area; may be used by the Air Tanker Coordinator to get a closer look at the target or to show an air tanker pilot a target that is difficult to describe or by a tanker pilot to get a better look at the target or to warn ground personnel of an impending drop.

- M -

Main ridge: Prominent ridge line separating river or creek drainage. Usually has numerous smaller ridges (spur ridges) extending outward from both sides. Can be confusing if not covered in orientation.

May Day: International distress signal/call; when repeated three times, it indicates imminent and grave danger and that immediate assistance is required.

Maximum ferry range: Greatest distance that an airplane can travel in air speed miles under unloaded optimal working speed and working radius flight conditions.

Message center: Part of the Incident Communications Center and collocated or placed adjacent to it. It receives, records and routes

information about resources pertaining to the incident, resource status and administration and tactical traffic.

MOA: A military operations area (special use area) found on aeronautical sectional charts.

Mobilization center: An off-incident location at which emergency service personnel and equipment are temporarily located pending assignment, release, or reassignment.

Modular airborne firefighting system (MAFFS): A pressurized self-contained retardant system for use in Lockheed C-130 military aircraft.

Mop-up, dry: A method in which burning materials are extinguished without water.

Mop-up, wet: A method in which burning materials are extinguished with water, or in combination with water and soil.

MSL: Mean sea level.

MTR: A military training route found on aeronautical sectional maps and AP/18 maps; routes accommodate low-altitude training operations -- below 10,000 feet MSL -- in excess of 250 KIAS.

Multi-agency coordination (MAC): A generalized term which describes the functions and activities of representatives of involved agencies in a geographic area who come together to make key decisions regarding the prioritizing of incidents and to share the use of critical resources. A MAC organization is not part of the ICS and is not involved in incident strategy or tactics.

MXMS: (Mixmaster) is a technical position providing coordination and support of the retardant operation. The MXMS reports to the ATBM or SEMG at a Seat Base. See IABOG for list of duties.

- N -

National interagency management system (NIMS): Five major subsystems which collectively provide a total system approach to all-risk incident management -- the Incident Command System; Training; Qualifications and Certification; Supporting Technologies and Publications Management.

National Wildfire Coordinating Group (NWCG): A group of people formed under the direction of the Secretaries of the Interior and Agriculture and composed of representatives of the U.S. Forest Service, BLM, National Park Service, U.S. Fish and Wildlife Service and the Association of State Foresters. The group's purpose is to improve the coordination and

effectiveness of wildland fire activities and provide a forum to discuss, recommend appropriate action and resolve issues and problems of substantive nature. It is the certifying body for all courses in the National Fire Curriculum.

Normal fire season: (1) A season when weather, fire danger and number and distribution of fires are about average. (2) A period of the year that normally comprises the fire season.

Normal operating speed: Air speed under fully loaded configuration normally used by pilots in the field; may be a range or average speed.

NTSB: National Transportation Safety Board.

- O -

OAS: *Office of Aircraft Services*

On target: Acknowledgment to the pilot that the drop was well placed.

One foot in the black: Constructing fireline next to the fire; usually the safest method of attacking a fire of low or moderate intensity in light fuels.

Open line: Refers to open fire front where no line has been constructed.

Operational period: The time frame scheduled for execution of a given set of operation actions as specified in the Incident Action Plan.

Orbit: See **hold**.

Out-of-service resources: Resources assigned to an incident but unable to respond for mechanical, rest or personnel reasons.

- P -

Patrol: (1) To travel a given route to prevent, detect and suppress fires. (2) To go back and forth watchfully over a length of fireline during or after its construction to prevent slop-overs and to control spot fires. (3) A person or group carrying out patrol actions.

Perimeter: The total length of the outside edge of the burning or burned area.

Planning meeting: A meeting, held as needed throughout the duration of an incident, to select strategies and tactics for incident control operations and for service and support planning.

Pockets: Deep indentations of unburned fuel along the fire perimeter; normally, fireline will be constructed across pockets and they are then burned out.

Prescribed burning: Controlled application of fire to wildland fuels in either their natural or modified state. Done under specified environmental conditions which allow the fire to be confined to a predetermined area and at the same time to produce the intensity of heat and rate of spread required to attain planned resource management objectives.

Pre-suppression: Activities in advance of fire occurrence to ensure effective suppression action; includes recruiting and training, planning the organization, maintaining fire equipment and fire control improvements and procuring equipment and supplies.

Pre-treat: Laying retardant line in advance of the fire where groundcover or terrain is best for fire control actions, or to reinforce a control line; often used in indirect attack.

Progressive hose lay: Hose laid as it is used to suppress the fire. Lateral hose lines are connected to the main hose line at regular intervals to assist in the fire suppression effort and mop-up.

Protection boundary: The exterior boundary of an area within which a given agency has assumed a degree of responsibility for emergency operations. It may include lands protected under agreement or contract.

PSI, PSIG: Pounds per square inch of mercury; a measure of pressure.

- R -

Radio cache: May consist of a number of portable radios, a base station and in some cases a mobile repeater, all stored in a predetermined location for dispatch to an incident.

RADO: *(Radio Operator) is a logistics position. The RADO may report to the ATBM or FWBM or SEMG at a Seat Base. See IABOG for list of duties.*

RAMP: *(Ramp Manager) is a technical specialist functioning under Air Operations. The RAMP may report to the ATBM or FWBM or SEMG at a Seat Base. See IABOG for list of duties.*

Rate of spread: The relative activity of a fire in extending its size, expressed as rate of increase of the total perimeter of the fire, as rate of forward spread of the fire front or as rate of increase in area, depending on the intended use of the information.

Reburn: (1) Subsequent burning of an area in which fire has previously burned but has left flammable fuel that ignites when burning conditions are more favorable. (2) An area that has reburned.

Reciprocating: Internal combustion, as opposed to turbine, engine.

Red Flag Warning: Used to warn of impending, or actually occurring critical weather conditions that could result in extensive wildland fire activity. Its issuance denotes a high degree of confidence that weather and fuel conditions consistent with local Red Flag Event criteria will occur in 24 hours or less.

Relative humidity: The ratio of the amount of moisture in a given volume of space to the amount that volume would contain if it were saturated. The ratio of the actual vapor pressure to the saturated vapor pressure.

Resistance to control: The relative difficulty of constructing and holding a fireline as affected by resistance to line construction and by fire behavior; also called difficulty of control.

Resources: All personnel and major items of equipment available, or potentially available, for assignment to emergencies; described by kind and type.

Retardant (long-term): Contains a chemical which alters the combustion process and causes cooling, smothering/insulating of fuels; remains effective until diluted or rinsed off by precipitation.

Retardant (short-term): Chemical mixture whose effectiveness relies mostly on its ability to retain moisture, thereby cooling the fire; common short-term retardants are water and foam.

Retardant line: Usually constructed by an air tanker or helicopter; treated like wet line and followed up with ground action.

Risk: (1) The chance of fire starting as determined by the presence and activity of causative agents. (2) A causative agent. (3) A number related to the potential number of firebrands to which a given area will be exposed during the rating day.

Rotor span: The length of a rotor diameter, it is used to make adjustments in the alignment of flight routes when dropping water/retardant, e.g., "Move the next drop two rotor spans to the left."

Route (flight): The path an aircraft takes from a departure pattern or point to an arrival point or pattern at destination.

RTCM: (Retardant Crewmember) is a technical specialist and may report to the MXMS or ATBM or SEMG at a Seat Base. See IABOG for list of duties.

- S -

Saddle: Depression or pass in a ridge line.

SAFECOM: A SAFECOM is an aviation communiqué that is used to report any condition, act, observation or maintenance problem that may have the potential to cause an aviation-related mishap. The SAFECOM web site can be accessed at: <https://www.safecom.gov/>

SAFENET: A SAFENET is a form that is used as a tool to report and resolve safety concerns encountered in fire operations. The SAFENET web site can be accessed at: <http://safenet.nifc.gov/>

Safety zone: A preplanned area void of burnable fuels used for escape if the fireline is overrun or outflanked, or if a spot fire causes fuels outside the control line to render the fireline unsafe. During an emergency, tankers may be asked to reinforce a safety zone using retardant drops.

Salvo: Dropping the entire load or compartment(s) at one time.

SEAT (single engine air tanker): Commonly, but not always, an agricultural aircraft modified for aerial fire retardant and suppressant delivery.

SEAT Base Categories: SEAT bases are designated as Category I and Category II depending upon the development of the facilities.

Segment: A geographical area in which a task force/strike team leader or single resource boss is assigned authority and responsibility for coordinating resources and implementing planning tactics. May be a portion of a division; an area inside or outside the perimeter of an incident or a fire or group of fires within a complex. Identified with Arabic numbers.

Simple hose lay: A hose lay consisting of consecutive coupled lengths of hose without laterals, extended from the water source or pump to the nozzle. It is filled with water only after it is put in place.

Slash: Debris left after logging, pruning, thinning or brush cutting; includes logs, chunks, bark, branches, stumps and broken under story trees and brush.

Slopovert: A fire edge that crosses a control line or natural barrier intended to confine the fire, and the resultant fire.

Smokejumper: A firefighter who travels to fires by aircraft and parachutes to the fire.

Smoldering: Behavior of a fire burning without flame and slowly spreading.

Snag: A standing dead tree or part of a dead tree from which at least the leaves and smaller branches have fallen; often called **stub**, if less than 20 feet tall.

Span of control: The supervisory ratio of from three to seven individuals with five being established as an optimum.

Split load: The dropping of a partial load .

Spur ridge: A small ridge which extends finger-like from a main ridge.

Staging area: A temporary on-incident location, managed by the Operations Section, where incident personnel and equipment are assigned on a three-minute availability status.

Sterile cockpit: The flight crew will perform no radio or cockpit communication that is not directly related to safe flight of the aircraft during the time from beginning taxi to 5 miles out and from 5 miles out until after landing and clearing the active taxiway. SEAT pilots have the right to a sterile cockpit environment when departing and landing at any base operating SEATs, including Large Airtanker Bases. Due to having only one pilot in the cockpit, it is critical that the SEAT pilot is allowed to remain on the airport Tower, Ground or Unicom frequency and continually monitor the airport advisory traffic as needed. Switching from Tower, Ground, or Unicom to the base frequency to provide a roll time can lead to the pilot missing critical airport advisory traffic.

Strike team: Specified combinations of the same kind and type of resources, with common communications and a leader.

Strip burning: (1) Burning by strip firing. (2) In hazard reduction, burning narrow strips of fuel and leaving the rest of an area untreated by fire.

Strip firing: Setting fire to more than one strip of fuel and providing for the strips to burn together; frequently done in burning out against a wind where inner strips are fired first to create drafts which pull flames and sparks away from the control line.

SUA (special use airspace): Includes military operations areas (MOAs), restricted areas, prohibited areas, alert areas, warning areas and controlled firing areas.

Swamper: A firefighter who leads a bulldozer. Additionally, the assistant to a saw operator.

- T -

Tactics: Deploying and directing resources on an incident to accomplish the objectives designated by the overall strategy.

Target: The area or object intended for a retardant/water drop to cover, e.g., “Your target is the right flank.”

Task force: Any combination of single resources, within the span of control, assembled for a particular tactical need, with common communications and a leader.

TFR (14 CFR 91.137): Temporary flight restriction; vertical and horizontal airspace in which non-incident aircraft are restricted from entry.

Tie in: To connect a retardant drop with a specified point, i.e., road, stream, previous drop, etc. “Tie in Tanker 62’s drop with the road.”

Tractor-plow: Any vehicle with a plow for exposing mineral soil, with transportation and personnel for its operation; used mainly in southern U.S.

Traffic pattern: The path or route aircraft traffic takes when landing or taking off or when performing tactical missions in the incident airspace or operations area.

Trail: To drop doors in sequence, resulting in a long, unbroken retardant line.

Trench: A small ditch often constructed below a fire on sloping ground (undercut or underslung line) to catch rolling material (see **cup trench**).

Turbine: Jet-propelled, as opposed to reciprocating, engine.

- U -

UHF (ultra high frequency): Common to military aircraft; incompatible with the VHF radio system. Operates in 300 to 3000 Mhz range.

Underslung line: Line constructed on a hillside when there is the possibility of burning materials rolling down and crossing the fireline; incorporates a trench into its construction.

Unified command: A command structure which provides for all agencies or individuals with jurisdictional responsibilities, geographical or functional, to jointly manage an incident through a common set of objects.

Upwind (flight pattern): A flight path parallel to the direction of the final before turning cross-wind.

- V -

VHF (very high frequency): The standard aircraft radio that all civil and most military aircraft use to communicate with Federal Aviation Administration facilities and other aircraft.

VHF-AM (very high frequency/amplitude modulation): Aircraft radio range, 118 to 130 Mhz; used on wildland fire incidents for ground-to-air and air-to-air communications.

VHF-FM (very high frequency/frequency modulation): Multi-agency radio commonly used for dispatch, land-based mobile and airborne communications; operates in range of 150 Mhz to 174 Mhz.

Victor: Another way of referring to VHF-AM, e.g., “Come up on Victor.”

- W -

Water tender: Any ground vehicle capable of transporting specified quantities of water.

Waterway Environmental Guidance (300 Foot Buffer): When approaching a waterway (lakes, river, streams, and ponds) visible to the pilot, the pilot shall terminate the application of retardant, water, gel, or foam approximately 300 feet before reaching the waterway. When flying over the waterway, the pilot will not begin dropping until 300 feet after crossing the far bank or shore. The pilot shall make adjustments for airspeed and ambient conditions such as wind to avoid dropping within the 300 foot buffer zone. These guidelines do not require the pilot to fly in such a way as to endanger their aircraft, other aircraft, or compromise ground personnel safety.

Wet line: Line constructed using water or foam to extinguish the flame front or to be used to burn from; except in VERY light fuel, a wet line should not be considered the final control line (which should be cut through the fuel to mineral soil).

Wetting agent: A chemical that reduces the surface tension of water and causes it to spread and penetrate more effectively.

Wet water: Water with added chemicals (wetting agents) that increase its spreading and penetrating properties.

Wildfire: Any fire on wildland except a fire under prescription.

Wildland: An area in which development is essentially nonexistent, except for roads, railroads, power lines and similar transportation facilities.

Wingspan: The length of a wing span from tip to tip; used to make low-level flight route adjustments, e.g., “Move your drop one wingspan to the right.”

APPENDICES

The following appendices are reference material only and should not be considered as policy.

Appendix A: *SEAT Base Staffing Matrix and Training Elements*

Appendix B: SEAT Base Operations Plan

Appendix C: *SEAT Base Checklist*

Appendix D: *Hand Signals for Airtanker Base Ramp Operations*

Appendix E: Interagency Single Engine Air Tanker Board Contacts

Appendix F: Single Engine Airtanker Program Request for Revision

Appendix A: ***SEAT Base Staffing Matrix and Training Elements***

SEAT Base Staffing Matrix and Training Elements can be found on the BLM SEAT Web site at:

<http://www.blm.gov/nifc/st/en/prog/fire/Aviation/Airops/seat.html>

Appendix B: *SEAT Base Operations Plan*

The SEAT Base Operations Plan template with example can be found on the BLM SEAT Web site at:

<http://www.blm.gov/nifc/st/en/prog/fire/Aviation/Airops/seat.html>

Appendix C: ***SEAT Base Checklist***

The checklist can be found on the BLM website under SEAT Base Review:

http://www.blm.gov/nifc/st/en/prog/fire/fireops/preparedness/preparedness_review/checklists.html

Appendix D: *Hand Signals for Airtanker Base Ramp Operations*

Hand signal discussion and chart can be found in the *Interagency Air-tanker Base Operations Guide*, Appendix A, Exhibit A-1.

<http://www.nwcg.gov/pms/pubs/pms508.pdf>

Appendix E: Interagency Single Engine Air Tanker Board Contacts

Chairman Glen Claypool Bureau of Land Management
Office Phone: 208 - 387 - 5160

Member Scott Fisher U.S. Forest Service
Office Phone: 208 - 387 - 5968

Member Joel Kerley Bureau of Indian Affairs
Office Phone: 208 - 387 - 5371

Member Earl Palmer *Office of Aviation Services*
Office Phone: 208 - 433 - 5078

Member *Mark Eliot* Department of Idaho State Lands
Office Phone: 208 - 666 - *8709*

Appendix F: Single Engine Airtanker Program Request for Revision

Submission of Revisions/Suggestions Protocol

The National Single Engine Airtanker (SEAT) program has been consistently increasing in use and complexity over the last several years. SEATs are now being utilized in many different fuel types, elevations and a variety of aerial operations.

In order to maintain standards and develop a strong interagency program that focuses on safe, efficient and effective SEAT operations, it has become necessary to establish a protocol to incorporate and evaluate new ideas.

All suggestions, revisions or new ideas must be documented and submitted on the Single Engine Airtanker Program Request for Revision form.

The form must be submitted to the BLM National SEAT Program Manager through a state or regional level aviation officer, depending upon agency structure. Submitting the form through a state or regional level aviation officer provides the oversight to help ensure that the request benefits the entire SEAT program.

Request forms will be evaluated at the end of each year by a committee appointed by the BLM SEAT Program Manager and approved by the Interagency SEAT Board.

The appointed committee will provide their recommendations to the BLM SEAT Program Manager for incorporating the suggestion or changes into the SEAT program.

A summary report will be provided to the Interagency SEAT Board for review on an annual basis. The report will document all the requests submitted, the committees' recommendations to the BLM Program Manager, and final actions taken on the requests.

BLM National SEAT Program Manager--Glen Claypool

Note: The form on the following page can be found on the BLM National SEAT Web site at:

<http://www.blm.gov/nifc/st/en/prog/fire/Aviation/Airops/seat.html>

Single Engine Airtanker Program Request for Revision form

Date of Request:	Page: of Total Pages
Name of Person Submitting Request: Phone: ()	Agency: Home Unit Address:
Name of State or Regional Level Aviation Officer: Phone: ()	
Type of Request: <input type="checkbox"/> Revision to Policy <input type="checkbox"/> Revision to Contracts <input type="checkbox"/> Training <input type="checkbox"/> Other: _____	
Request Narrative: (Attach additional pages if needed)	
This form must be submitted <i>through</i> your state or regional aviation officer to: BLM National SEAT Program Manager at: gclaypoo@blm.gov	