

A publication of the  
National Wildfire  
Coordinating Group



# NWCG Standards for Airtanker Base Operations

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The *NWCG Standards for Airtanker Base Operations (SABO)* standardizes operations and procedures at interagency airtanker bases to ensure safe, efficient, and effective operations in support of interagency goals and objectives. Further objectives include:

- Support wildland fire and aviation policy through interagency coordination and cooperation.
- Provide common, interagency standards when working with contractors and air operations management.
- Facilitate the interoperability of airtanker base personnel among all participating wildland fire agencies and organizations through standardization.
- Provide a reference for commonly accepted forms, checklists, etc.
- Provide a framework for developing local Airtanker Base Operations Plan (ABOP), which provide local, and agency-specific guidance.
- Provide a standard interagency guide to airtanker base management, operations, responsibilities, and administration, available to all members of the airtanker base community.

**The appendices for the *SABO* are available as a separate PDF document, <https://www.nwcg.gov/publications/pms508>.**

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The National Wildfire Coordinating Group (NWCG) provides national leadership to enable interoperable wildland fire operations among federal, state, Tribal, territorial, and local partners. NWCG operations standards are interagency by design; they are developed with the intent of universal adoption by the member agencies. However, the decision to adopt and utilize them is made independently by the individual member agencies and communicated through their respective directives systems.

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## Chapter 01 – Introduction

This publication is intended to be used in conjunction with other guides or references, such as applicable contracts, local Airtanker Base Operations Plan (ABOP), the *Interagency Standards for Fire and Fire Aviation Operations* (Red Book), <https://nifc.gov/standards/guides/red-book>, and other state, or local aviation plans or guides. These references together assist in the standardization of common procedures and best practices throughout airtanker base operations.

Incorporated into this document is the former *NWCG Standards for Single Engine Airtanker (SEAT) Operations Guide*, PMS 506. Any reference to airtanker bases includes SEAT bases, Large Airtanker (LAT) bases, and Very Large Airtanker (VLAT) bases.

This publication identifies the minimum interagency standards for airtanker base operations. Agencies may create or have more restrictive standards. Refer to agency policy and the policy of the agency that contracts the aircraft working from the base.

### Airtanker Bases

Airtanker bases are generally managed at the local unit level of the host agency. The local host unit is responsible for ensuring all established facilities are maintained and operated per the agency's policy and this document.

All airtanker bases (permanent or temporary) shall develop and annually update a local ABOP as outlined in the *SABO*.

Airtanker types and models vary in specification, and ground-handling characteristics. Similarly, airtanker bases, and airports vary as well. Each airtanker base or host agency must identify and approve the aircraft and operations they support.

Approval of the actual airport in terms of airtanker performance shall be by the host agency's Airtanker Program Manager or other identified aviation management. Such approvals, when applied to cooperator airtankers will require coordination with the cooperator's Airtanker Program Manager.

All airtanker bases (permanent and temporary) will have current overweight authorizations or waivers for airtankers that exceed the airport's published weight-bearing capacity. The written authorization or waiver shall come from the airport authority and be in place before airtanker operations commence. Overweight authorizations and waivers must address runways, taxiways, and ramps, and be specific to airtanker Max Gross Landing Weight and Max Gross Taxi Weight. Copies should be provided to appropriate aviation management personnel.

When any specific agency's owned or contracted airtankers operate from airtanker bases owned or managed by other cooperators, agencies, or jurisdictions, the agency with the airtanker should make available a liaison to the other agency's airtanker base. The liaison will assist and provide administration and technical oversight of the agency's airtanker, policies, and operational procedures.

### Airtanker Base Types

There are two basic types of airtanker bases: permanent and temporary.

## **Permanent**

An airtanker base that has permanent infrastructure installed in an identified area to service airtankers and support aircraft. Retardant and/or wildland fire chemicals may be stored on this site year-round.

The airtanker base can have permanent personnel whose main role is to act as management and support for the airtanker base and its facilities or may be staffed as needed.

## **Temporary**

An identified and approved airport that could serve the need of loading airtankers. The airport would have little if any infrastructure to support the loading of airtankers and the additional equipment would have to be delivered and set up. Retardant and/or wildland fire chemicals are stored on-site temporarily to support operations as needed. This term would be used regardless of the ownership of the mixing and loading equipment. Personnel could be identified at the local unit to facilitate the management in support of the temporary airtanker base or personnel from outside of the area may be utilized in the management and support of the airtanker base.

In coordination with appropriate local and regional agency aviation management, the United States Forest Service (USFS) Airtanker Program Manager must pre-approve any proposed temporary base before any USFS contracted airtankers operate from that location.

## **Base Considerations**

The following items must be addressed before commencing operations:

- Overweight waivers/authorizations from the airport authority (if applicable).
- Agreement(s).
  - Land use
  - Water use
  - Facilities
  - Washdown Procedures
- Approval of airport in terms of large airtanker performance.
- Local ABOP/Temporary Base Operating Plan.
- Ingress and egress to and from the loading pit(s).
- The hosting agency must ensure the appropriate arrangements have been made for using the ramp space and any facilities for the base.
- The base manager must be provided with a complete briefing about the base location and operational procedures by the hosting agency.
- An emergency response plan must be identified or developed for the base.
- The base manager must be briefed on and follow the agency's procedures established for hazardous materials and retardant spills for the base. The briefing must be conducted by the aviation manager responsible for the base or a knowledgeable designee.

- The base manager must be briefed on and follow the requirements of the Storm Water Pollution Prevention Plan (SWPPP) if in place. The briefing must be conducted by the aviation manager responsible for the base or knowledgeable designee.
- A Risk Management Worksheet (RMW) or Job Hazard Analysis (JHA) must be developed by the base manager to use at the site.
- Adequate facilities and logistical support must be in place to ensure the safety and welfare of all personnel assigned to the base.
- An assessment of security concerns must be made by the hosting agency.
- A jettison area must be designated for the base.

For more specific airtanker base layout guidance, see Airtanker Ground Maneuvering and Parking Considerations at <https://www.nwcg.gov/committee/airtanker-base-operations-unit>.

There are two types of retardant contract bases: Type A (Full Service) and Type B (Bulk). Refer to agency retardant contract for more specific information.

### **Supplemental Airtanker Base Equipment: Portable and Mobile**

The two types of equipment listed below can be ordered for a temporary airtanker base or used as supplemental equipment at a permanent base.

Neither of these terms is descriptive of an airtanker base type. These terms are only descriptive of the types of equipment and facilities that may be in use at a temporary airtanker base or used as supplemental equipment at permanent airtanker bases. An airtanker base type is not identified by the method through which equipment and facilities are procured or obtained.

#### **Portable Airtanker Base (PAB)**

The unit is an enclosed semi-trailer with the equipment and supplies required for temporary airtanker base operations. The current PABs are U.S. Forest Service owned and requests for them must be coordinated through Region 8's Regional Aviation Officer (RAO).

#### **Mobile Retardant Base (MRB)**

An MRB is a portable retardant mixing plant typically provided through the agency retardant contract (see Appendix B, Mobile Retardant Bases).

### **Airtanker Base Operations Plan (ABOP)**

Each airtanker base shall develop and annually update a local ABOP. The plan should not repeat policy and procedures contained in the *SABO*, agency manuals, or handbooks, but should provide local operational procedures and information. Appendix C, Recommended Outline for a local Airtanker Base Operations Plan, is the national standard for an ABOP. All SEAT and/or Temporary airtanker bases will utilize the standard template in Appendix A, ABOP (SEAT or Temporary Base).

### **Aircrew Briefing and Orientation**

Each airtanker base shall develop an aircrew briefing and orientation to be given either orally or in checklist or packet form to each aircrew that arrives at the airtanker base as soon as reasonably

practicable. An example of what should be included in an aircrew briefing and orientation is in Appendix D, Aircrew Briefing and Orientation Outline.

## **Hot Loading Plan**

Each airtanker base that intends to conduct hot loading operations will develop a plan to describe the training and procedures. Appropriate agency aviation management personnel must review and approve the plan prior to hot loading an airtanker.

Airtanker base personnel who will participate in this operation will be trained using the base Hot Loading Plan and a record of this training will be maintained at the airtanker base. Refer to Appendix E, Hot Loading Plan Template, for the national standard for hot loading.

## **Simultaneous Fueling and Loading Plan**

Each airtanker base that intends to conduct simultaneous fueling and loading operations will develop a plan to describe the training and procedures. Appropriate agency aviation management personnel must review and approve the plan prior to simultaneous fueling and loading operations. Airtanker base personnel who will participate in this operation will be trained using the base's Simultaneous Fueling and Loading Plan and a record of this training will be maintained at the airtanker base. Refer to Appendix F, Simultaneous Fueling and Loading Plan Template, for the national standard.

Note: If an airtanker base intends to conduct both hot loading and simultaneous fueling and loading, the base must have an approved plan for each operation.

## **Security Plan**

Each airtanker base shall develop a security plan as required. Refer to agency-specific templates or requirements.

# **Chapter 02 – Personnel**

## **Introduction**

Airtanker base positions function to support the objectives of wildland fire incidents. An individual must be trained, experienced, current, and certified before planning or participating in airtanker base operations. Training, experience, and currency requirements for the various airtanker base positions are found in a variety of documents and not entirely herein.

## **Qualifications**

Training, qualification, and currency requirements for airtanker base positions are established in the *NWCG Standards for Wildland Fire Position Qualifications*, PMS 310-1, <https://www.nwcg.gov/publications/pms310-1/nwcg-standards-for-wildland-fire-position-qualifications-pms-310-1>.

Other agencies may have specific training and qualification requirements outside of the PMS 310-1. Follow state or local agency policy and direction as required.



## Certification

The completion of a Position Task Book is the primary criterion for evaluation for most airtanker base positions. Some agencies may provide and require agency-specific task books for some airtanker base positions. Where they exist, follow agency policy on their use.

Position task books can be found on the NWCG website, <https://www.nwcg.gov/training/nwcg-position-task-books>. Evaluations of airtanker base personnel must be conducted and documented based on the roles and responsibilities and other criteria within the *SABO* and listed in the position's Incident Position Description at <https://www.nwcg.gov/positions/position-catalog>.

Qualified airtanker base personnel are expected to train, mentor, and evaluate new, and less experienced personnel.

## Position Roles and Responsibilities

### General

Personnel working at an airtanker base shall receive training in airtanker base operations and specific training for the position(s) to which they are assigned. Exhibit 1 depicts the various positions within the airtanker base organization. This organization should be expanded or contracted as needed to meet the current or expected activity level.

### Incident Position Descriptions

For the following positions, position standards (including position descriptions and minimum position requirements for training, experience, physical fitness, and position currency) visit the NWCG Position Catalog, <https://www.nwcg.gov/positions/position-catalog>:

Airtanker Base Manager (ATBM), <https://www.nwcg.gov/positions/airtanker-base-manager>

Fixed Wing Base Manager (FWBM), <https://www.nwcg.gov/positions/fixed-wing-base-manager>

Single Engine Airtanker Manager (SEMG), <https://www.nwcg.gov/positions/single-engine-airtanker-manager>

Ramp Manager (RAMP), <https://www.nwcg.gov/positions/ramp>

Fixed Wing Parking Tender (FWPT), <https://www.nwcg.gov/positions/fixed-wing-parking-tender>

Aircraft Timekeeper (ATIM), <https://www.nwcg.gov/positions/aircraft-timekeeper>

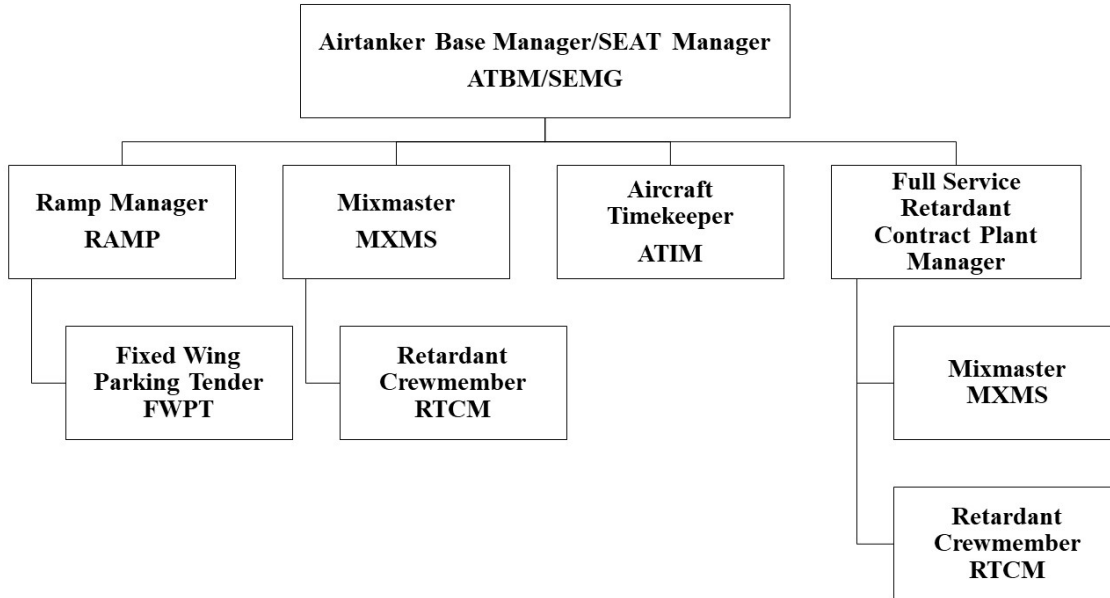
Mixmaster (MXMS), <https://www.nwcg.gov/positions/mixmaster>

Retardant Crew Member (RTCM), <https://www.nwcg.gov/positions/retardant-crewmember>

For the duration of this publication, any references to “base manager” refers to ATBMs and/or SEMGs.

### Exhibit 1: Basic Airtanker Base Organization Chart

When working at a large airtanker base, FWBM/SEAT Manager (SEMG)/Modular Airborne Firefighting Systems (MAFFS) Airtanker Base Manager (MABM)/MAFFS Airtanker Base Specialist (MABS) report to the ATBM.



### Airtanker Base Staffing

Generally, on a day-to-day basis, the positions listed at an airtanker base are not all individually filled unless it is warranted by the amount of activity or anticipated activity. The ATBM maintains proficiency in and performs the duties of multiple positions when activity permits.

At both permanent and temporary bases, a qualified base manager will be on-site during airtanker operations.

A qualified base manager will be assigned during the retardant contract Mandatory Availability Period (MAP).

A qualified ATBM/SEMG may administratively manage up to four Single Engine Airtankers (SEATs) but may operationally manage more as necessary (e.g., multiple SEATs operating out of a base during the day while being administered by their assigned manager).

An ATBM may manage SEATs without a SEMG present while operating at a large airtanker base. The ATBM will be responsible for all SEMG duties.

Some considerations to identify the number and roles of personnel needed during airtanker operations include:

- Number and types of aircraft at the airtanker base.
- Number of loadings pits and simultaneous loading capability.
- Current or anticipated activity within the base’s response area.

- Number, type, and location of aircraft within the Geographic Area Coordination Center (GACC), or nearby GACCs.
- Ground maneuvering challenges around other aircraft and/or objects.
- Current and expected fire activity.
- Ratio of trainees to qualified personnel.
- Span of control.
- If there is no base risk assessment available, use the approved risk assessments located under Useful Resources at <https://www.nwcg.gov/committee/airtanker-base-operations-unit>.

Personnel may be assigned to more than one position in the airtanker base organization depending on the level of activity. This does not relieve the managing agency from ensuring that the individual is both trained and qualified to fill the position(s) to which they are assigned. Base managers must anticipate the need for and request additional personnel during periods of high activity and/or complexity.

Base managers have the ultimate responsibility to identify the number and positions needed daily to staff the airtanker base based on current and expected activity. In the local ABOP, identify activity levels, predicted fire weather, and/or additional risks or hazards to develop trigger points to increase or decrease staffing and discuss the specific procedures for ordering additional personnel.

The chart in Appendix I, Staffing Matrix, can assist with determining proper staffing levels to meet operational requirements.

## **Training**

The ATBM position qualification requires triennial attendance at an Airtanker Base Manager Workshop (N9057).

The SEMG position qualification requires triennial attendance at a SEAT Manager Workshop (RT-273).

If possible, each N9057 delivered should also encompass RT-273. N9057 can cover both the SEMG and ATBM Workshop requirements but two certificates may be necessary to meet IQCS/IQS currency requirements.

Refer to Appendix for additional training topics with documentation template. Retain records of completed trainings per your agency record-keeping requirements.

## **Airtanker Base Manager Workshop**

### **N9057 – Airtanker Base Manager Workshop Requirements (16-24 hrs. – Triennial)**

#### **Course Description**

The ATBM/SEMG workshop is designed to provide the attendee with current policy revisions, technical updates, changes in reference materials and operational procedures as well as an overall review of safety and security issues associated with the airtanker programs.

#### **Objectives**

- Review the roles and responsibilities of the ATBM/SEMG.
- Review risk management techniques to perform tasks safely.

- Update and maintain ATBM/SEMG skills.
- Understand changes in aviation policy and how they relate to airtanker base management.
- Review changes in airtanker and retardant contracts.

### **Target Group**

Qualified and trainee ATBMs/SEMGs.

### **Minimum Instructor Qualifications**

You must have a qualified ATBM and SEMG to fulfill both the N9057 and RT-273 instructor requirements.

### **Course Prerequisites**

Qualified or trainee as an ATBM/SEMG.

### **Course Level**

Local, geographic, or national.

### **Core Elements of an ATBM/SEMG Workshop Will Include the Following:**

#### **Season Review:**

This section generally covers year-end statistical information like total flight hours, gallons delivered, contract activity, highlights of what went well during the season and lessons learned.

#### **Season Outlook:**

This section generally covers any new technical updates, new contract information, and new long-, and short-term program changes.

#### **Updates of National Contracts:**

This section goes over changes to the national airtanker contracts, Department of the Interior (DOI) National SEAT Services Contracts and Wildland Fire Chemicals (WFC) contracts.

#### **Wildland Fire Chemicals (WFC) Review:**

This section covers information about new technology or developments within the WFC industry, reviews the approved products list and provides updates about the Lot Acceptance and Quality Assurance (LAQA) program.

#### **SABO Updates:**

This section covers revisions to the *SABO*, found under Useful Resources at <https://www.nwcg.gov/committee/standards-for-airtanker-base-operations-unit>.

#### **Updates of Reference Materials:**

This section covers any new updates and changes or additions to any of the reference materials designed for or related to the airtanker programs.

**Safety Review:**

This section covers a summary of the Aviation Safety Communique' (SAFECOMs) submitted on airtanker base operations. Discuss safety alerts or bulletins issued related to the program and highlights safety concerns and ramp operations lessons learned that surfaced throughout the season.

**Security Review:**

Discuss lessons learned from any security issues that occurred at airtanker bases, with aircraft, facilities, or personnel from the preceding seasons.

**Additional Suggested Topics:**

- Risk Management
- Dispatch/GACC input
- Standardized forms
- Communications
- Maintenance notification procedures
- Airtanker base readiness review summary

Flexibility should be encouraged within these topics to meet geographic, and audience needs. This workshop shall be designed to provide discussion and information sharing based on the identified topics. The agenda should be revisited annually and be dynamic. For the national workshop, the cadre will consist of all Airtanker Base Operations Unit (ABOU) members and delegated ABOU Working Group members. Subject Matter Experts (SMEs) to be involved in the workshop should be contracting and program management representatives. Depending on the audience, additional SMEs can be brought in as needed.

# Chapter 03 – Airtanker Base Equipment and Facilities

## Equipment

Equipment needed at an airtanker base can vary greatly depending on the complexity of the operation. Appendix J, Suggested Minimum Equipment at an Airtanker Base, contains a list of common equipment and parts for airtanker bases. Agency policy or other regulatory requirements may specify or require additional or specific equipment [i.e., Occupational Safety and Health Administration (OSHA), Environmental Protection Agency (EPA), National Fire Protection Association (NFPA), etc.]

Equipment must be kept in good condition and maintained, as necessary. Damaged or inoperable equipment shall not be used and will be repaired or replaced as soon as possible.

## Lighting

Adequate lighting should be provided as necessary for security, movement of aircraft, aircraft maintenance, personnel safety, etc. In cases where lighting is not enough for night aircraft maintenance, the contractors are responsible to provide their lighting.

## Electrical System

The airtanker base electrical system must meet local electrical codes and provide adequate electrical power to meet facilities, equipment, and operational requirements. In the case of a loss of power, battery-powered radios, gas pumps, or generators should be available to maintain operational capabilities. Electrical outlets or portable generator capability should be provided on the ramp/pit area.

## Audio System

A public address system should be provided at each airtanker base to alert personnel of pertinent information in a timely manner.

## Telephones

Telephones shall be in service at each airtanker base. It is recommended that permanent airtanker bases have a minimum of two telephone lines. Temporary airtanker bases must have a minimum of cell phone service; however, local management should have a contingency plan for the appropriate expansion of phone capability during periods of heavy use.

## Radios and Headsets

Permanent airtanker bases shall have VHF-AM and VHF-FM base station radio capability. For temporary airtanker bases, handheld AM, and FM radios are acceptable. Temporary bases shall ensure the proper frequencies have been authorized before use.

All airtanker bases will have handheld AM radios with aviation headsets capable of connecting to the AM handhelds that will be used while operating on the ramp. The ramp radios and headsets should be inspected daily to ensure operability.

Ramp headsets should have the noise cancelling feature to ensure optimal hearing protection for all personnel.

## Standby Facilities

Adequate standby facilities for aircrews and airtanker base personnel must be provided. The use of fixed-base operator (FBO) facilities/lounges for this purpose is not considered adequate. Base managers should have a contingency plan that allows for expansion of the standby area during periods of high fire activity (i.e., mobile trailer).

Permanent airtanker bases require non-agency-specific Wi-Fi to enable all personnel to perform their basic administrative duties in a cooperative environment, to limit interruption of work, to reduce data costs, and to support the interagency efforts of the base.

## Chapter 04 – Communications

It is crucial for base operations to be able to communicate effectively by radio. Use brief, clear, and concise messages while transmitting on the radio. Limit transmissions to important messages to minimize congestion and confusion. Acknowledge all messages. Refer to the ABOP for base-specific radio protocols.

### Plan

A Communication Plan shall be readily available at each airtanker base. All aircrews shall be briefed on communications procedures as contained in the local ABOP. Base managers are responsible for assuring that the information is current. This plan should include important phone numbers for the airtanker base and local agencies as well as commonly used frequencies.

### Frequencies

#### Airtanker Base/Ramp Frequency

A dedicated authorized frequency has been established for each permanent airtanker base. The frequency will be published in the *NWCG Airtanker Base Directory*, PMS 507, which is available by logging in at <https://egp.nwcg.gov/egp/>. An account is required.

Base managers are responsible for ensuring that all directory information is correct and provide updates as needed or at a minimum annually. Visit <https://www.nwcg.gov/committee/airtanker-base-operations-unit> for specific information on how to request changes to the directory.

Airtanker bases that do not have assigned frequencies when activated will order frequencies through the local dispatch center. Do not use a ramp frequency without approval. These frequencies are coordinated through the National Interagency Fire Center (NIFC) Communications Duty Officer (CDO) and the Federal Aviation Administration (FAA).

Frequencies are further discussed in Chapter 06 – Dispatch Procedures.

# Chapter 05 – Logistics

## Aircrew Accommodations

### Transportation and Lodging

It is the responsibility of the aircrew to arrange their ground transportation and lodging at the Assigned Work Location (AWL). The base manager may assist with providing contact information or checking on availability. If lodging or transportation is not available at AWL, it may be necessary to relocate the aircraft to another location where such resources are available. Coordinate the relocation through the proper dispatch channels.

### Food and Drink

In certain instances, base managers may need to provide food and drink for aircrews and other contractor personnel. Reference agency policy, applicable contract, and base operating plan for further direction.

# Chapter 06 – Dispatch Procedures

## Briefings

Each local ABOP should address the areas outlined in Appendix D, Aircrew Briefing Orientation Outline. Each aircrew that remains at the airtanker base beyond the first operational period should receive a thorough briefing about airtanker base procedures and a review of the local ABOP.

## Dispatch/Reaction Times

Fifteen minutes is the standard reaction time as specified in the federal airtanker contracts. The 15-minute standard is not applicable for delays caused by the agency, local air traffic, weather, planning for extended dispatches, flights to be made under Instrument Flight Rules (IFR), crews released for lunch by base managers, proficiency/mission currency flights and other causes beyond the pilot's control. Local, state, and regional procedures may further influence reaction times. Non-federal airtanker contracts may have different dispatch/reaction time procedures that must be followed per their respective contracts.

## Airtanker Rotation

To ensure consistent utilization, rotation, and management of the national airtanker fleet, please refer to *Interagency Standards for Fire and Fire Aviation Operations* (Red Book), Chapter 16, Aviation Operations/Resources, <https://www.nifc.gov/standards/guides/red-book>, for the most current National Rotation Policy.

## Aircraft Dispatch Information

Aircrews shall be provided with the following minimum information before a tactical/mission flight:

- Incident name (if available) and number.
- Latitude and longitude.
- Bearing and distance.



- Descriptive location.
- Elevation (if available).
- Assigned frequencies and contacts.
- Aircraft hazards.
- Other aircraft on scene or ordered.

This information will be verified by the base manager and a copy of the dispatch form should be given to the aircrews. A digital form of delivery may be utilized however a hard copy must be available if requested. Airtanker bases in California are required to use the FC-106 (California Interagency Aircraft Dispatch-Tactical Air Operations) but all other airtanker bases should use one of the standard dispatch forms located under Useful Resources at <https://www.nwcg.gov/committee/airtanker-base-operations-unit>. A copy of the resource order is unacceptable as a dispatch form for tactical missions but can accompany the dispatch form as needed.

In the event a copy of the dispatch form is not immediately available, the minimum dispatch information can be relayed via the radio. However, the aircrew must have the minimum information before takeoff. The dispatch office will provide this information to the airtanker bases. Local dispatch procedures should be reviewed with dispatch before the start of each fire season.

In the event of a divert, the aircraft dispatch information can be transmitted in flight.

Aircraft dispatched on pre-position or relocation point-to-point flights may do so with the information contained on aircraft resource order form generated from the official resource ordering system.

## **Pilot Duties Relative to Dispatching and Flight Following**

The pilot-in-command is responsible for flight safety and has authority to alter or terminate the flight when the flight cannot be conducted safely or efficiently.

The pilot-in-command is responsible for all preflight planning and flight operations in accordance with 14 CFR, agency policy, and the aircraft pilots operating handbook.

Once airborne, and out of sterile cockpit range, the pilot will contact dispatch with the following information:

- Aircraft call sign.
- Departure location.
- Number of people on board.
- Fuel on board (hours).
- Estimated Time En Route (ETE).
- Destination.
- Confirmation of automated flight following (AFF) “Confirm positive AFF.”
- There may be times where the incident the aircraft are responding to is within close proximity to an airbase. If this is the case, the pilot-in-command (PIC) may elect to flight follow with the airtanker base and the aerial supervisor over the incident. Notify dispatch if there are any changes to the normal flight following procedures.

- Some agencies may not require contact with dispatch after takeoff. Refer to agency policy and the policy of the agency that contracts the aircraft working from the base.

Point-to-point flights will be conducted either under an FAA flight plan or an agency flight plan. The method of flight planning and flight following must be established prior to departure.

## **Communications**

Frequency changes shall be relayed immediately to aircrews.

AFF shall be used according to approved procedures provided in the *National Interagency Standards for Resource Mobilization*, <https://www.nifc.gov/nicc/logistics/reference-documents>, Geographic Mobilization Guides and the *Interagency Standards for Fire and Fire Aviation Operations* (Red Book), <https://www.nifc.gov/standards/guides/red-book> or agency policy.

Provide aircraft responding from alternate airtanker bases the correct incident contact information and frequencies.

## **Frequencies**

### Ramp

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

### Air-to-Air (A/A) Tactical

A/A frequencies, as assigned by dispatch, are used by all tactical aircraft over the fire to coordinate aerial activities.

### Air-to-Ground (A/G) Tactical

A/G frequencies, as assigned by dispatch, are used to coordinate aerial activities with the ground activities.

### Command

Command frequencies are used to link the Incident Commander with the air operations staff and Air Tactical Group Supervisor (ATGS). These should be limited to overhead communications and should not be used for other traffic unless during an emergency.

### Air Guard (168.625 TX tone 110.9)

Air Guard is a national frequency with specific designated uses, such as emergencies, initial contact at an incident by inbound aircraft when incident frequencies are not known, 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. All aircraft and dispatch centers/offices will always monitor the Air Guard frequency.

### Local Flight Following

Some dispatch centers have a discrete frequency used for flight following in their local area. The dispatch center will provide the pilot with FM frequencies and tones that will be utilized for the duration

of the flight. This frequency will be used for initial check-in/status information, closeout information, and for 15-minute radio check-in if AFF cannot be utilized.

### National Flight Following (168.6500 RX/TX Tone 110.9)

The National Flight Following Frequency is used to monitor interagency and contract aircraft. All aircraft on point-to-point or mission flights should establish/terminate flight following and confirm AFF on the National Flight Following Frequency. All dispatch centers/offices will monitor the National Flight Following frequency at all times. A tone of 110.9 must be placed on the transmitter and receiver of the National Flight Following Frequency. The National Flight Following Frequency is to be used for flight following, dispatch, or redirection of aircraft. No other use is authorized.

### **Sterile Cockpit Procedures**

Sterile cockpit rules apply within a five-mile radius of the airport. The aircrew will not perform radio or cockpit communication that is not directly related to the safe flight of the aircraft from taxi to 5 miles out upon takeoff and from 5 miles out until clearing the active runway upon landing.

Sterile Cockpit Procedures means no communications between an aircraft and the airtanker base, dispatch office, or ramp personnel while the aircraft is in critical phases of flight (taxiing, takeoff, climb and approach, and landing) unless it involves the safety of flight. Fire dispatching, cancelled orders, or reload instructions are not related to the safe flight of the aircraft.

Exception: When conducting firefighting missions within 5 miles of an uncontrolled airport, maintain a sterile cockpit until departing the traffic pattern and reaching final altitude. Monitor the Common Traffic Advisory Frequency (CTAF) if feasible while engaged in firefighting activities. Monitor CTAF as soon as practical upon leaving the fire and returning to the uncontrolled airport. When conducting firefighting missions within Class B, C, or D airspace, notify dispatch that Air Traffic Control (ATC) communications will have priority over dispatch communications.

## **Chapter 07 – Operations**

### **Introduction**

Good communications, daily briefings, on-the-job training, and regard for safety are key factors in ensuring the safety and efficiency of airtanker base operations. The following standards will be followed at all airtanker bases.

### **Responsibility**

The base manager has overall authority for the base operations and base personnel. Some tasks and authorities may be delegated; however, the responsibility remains with the base manager.

The base manager ensures that there are adequate facilities, services, space, supplies, equipment, WFC, personnel, logistical needs, and support for expected operations.

## Briefings

Briefings are the responsibility of the base manager but may be delegated, shall be held daily, and are conducted for the following reasons:

- To address specific issues, such as the previous day's activities or convey or exchange pertinent information.
- To provide tactical information, before, or during mission, as incident needs change.
- To conduct an After Action Review (AAR) following any operational activity at the airtanker base.
- To address and discuss safety concerns.

Any briefing must be documented. Documentation should include the facilitator's name, printed name, and signature of all attendees, date, and list of topics discussed.

Refer to Appendix K, Daily Operational Briefing Materials, for topics, and websites for materials to use for the daily operational briefings.

Risk assessments should be done daily. Refer to Appendix L, Daily Risk Assessment, for a standard template.

## Operations Administration

The base manager has ultimate responsibility for administration oversight; however, the ATIM, if filled, may be delegated some if not all the tasks below. Refer to the ABOP for base-specific delegations and guidance.

- Receive, validate, and relay dispatch information.
- Answer the radios and phones and relay messages.
- Monitor retardant loads.
  - Check every load to ensure retardant load's refractometer reading is within contract specifications.
  - Calculate the pounds loaded into the airtanker by the contract specific weight of mixed retardant into gallons and document per ABOP.
  - If the load is not at contract or requested amount or there is a discrepancy between the shown load and the PIC and/or MXMS, make required notifications immediately. The base manager and PIC will mitigate the issue.
  - Per the FAA the airtankers are not permitted to take any more retardant than what is on the Supplemental Type Certificate (STC) regardless of fuel or other weight factors. If the airtanker is loaded with more than what the STC allows, notify the PIC, and ATBM immediately.
- Relay all changes of aircraft status to the ATBM immediately (e.g., out of service, in service, on hold, released etc.)
- Accurately record all aircraft flight time, ramp moves, availability, unavailability, cancelled dispatches, etc. Refer to aircraft contracts for details on calculating each. Verify with the aircrew daily.

- Complete required daily paperwork per the ABOP.
- Monitor AFF for situational awareness. Communicate anomalies (e.g., red aircraft icon, unexpected aircraft heading towards the base, diverting aircraft, etc.) to the appropriate personnel.
- Maintain the radio and phone log, and the daily diary capturing all pertinent information.
- Communicate with other airtanker bases in a timely manner regarding aircraft movement as appropriate.
- All administrative documentation will be verified for accuracy by the base manager by the end of the day. Disseminate as required or requested.

## **Ramp Safety Awareness**

### **General Precautions**

- All personnel will perform only the duties for which they are responsible.
- Only essential personnel will be allowed in the loading area during hot loading operations.
- No ramp personnel or RTCMs are to be involved in activities on the side of the aircraft adjacent to operating engines; this might require preplanning at airtanker bases with wingtip-to-wingtip (parallel) loading pits.
- Never walk beneath, between, or near aircraft propellers or engines – operating or stopped.
- Do not approach aircraft until the appropriate engines have been shut down, and the FWPT has signaled the aircraft is clear to approach.
- When possible, avoid the area to the rear of the aircraft while the engines are running due to hazards such as propeller/jet blast, dust, debris, exhaust, and fumes, except for the S-2T and Single Engine Airtankers (SEATs).
- Be aware that fumes from raw fuel can ignite.
- No smoking or vaping.
- Provide initial firefighting services, as requested by the ATBM or PIC, commensurate with training and personal protective equipment (PPE).
- High noise levels, such as other aircraft, Auxiliary (APU) or Ground Power Units (GPU).
- Propeller/jet blast and flying debris when aircraft pulls out of the loading pit.
- Limit cell phone use while on the ramp. Refer to the local ABOP for specific direction on cell phone use during operations.

### **Foreign Object Debris (FOD)**

The FAA defines FOD as any object, live, or not, located in an inappropriate location in the airport environment that can injure ramp personnel and damage aircraft.

A plan to deal with FOD should be included in the ABOP. A FOD walk of the ramp, should be conducted on a regular schedule; however, during ramp operations, one shall be performed daily or

more often if necessary. FWPTs shall conduct periodic FOD inspections of their assigned areas before and after aircraft movement.

### **Equipment Foul Lines and Foul Boxes (LAT and VLAT Bases)**

Foul lines and foul boxes identify safe zones or areas where Ground Support Equipment (GSE) can be secured without impedance by aircraft. The aviation industry has recognized that foul lines and foul boxes have reduced ground-handling accidents.

The following recommendations come from the *Interagency Aviation Lessons Learned (IA LL) 17-06*, found under Useful Resources at <https://www.nwcg.gov/committee/airtanker-base-operations-unit>, and should be incorporated at airtanker bases.

- A foul line will be placed no less than 10 feet (30 feet is preferred) away from where the closest aircraft wingtip will taxi. All GSE or other equipment will be placed and secured on the “safe” side of the line before releasing the aircraft for taxi. Base managers must ensure that all base personnel are trained in identifying properly secured GSE.
- Foul boxes will fully encompass the piece of equipment with a minimum of 18 inches of clearance on all four sides. They will be clearly labeled to identify the equipment that is to be parked in the space. All foul boxes will be in an area that will maintain a 30-foot separation from all aircraft while parked or taxiing.
- Foul lines and/or foul boxes will be located and marked in accordance with the local airport authorities’ operating procedures or FAA Advisory Circular 150/5340 –1M, Standards for Airport Markings  
[https://www.faa.gov/airports/resources/advisory\\_circulars/index.cfm/go/document.current/documentNumber/150\\_5340-1](https://www.faa.gov/airports/resources/advisory_circulars/index.cfm/go/document.current/documentNumber/150_5340-1).
- At temporary airtanker bases, the lines may be marked with tape.

Airtanker bases can utilize either foul lines or foul boxes to meet the requirements of their operations. While both safety measures can be used, at minimum, one safety measure (lines or boxes) must be utilized and identified in the ABOP.

### **Aircraft Parking**

- Ensure all assigned equipment and PPE is available and functional daily. Check battery power throughout the day. Consider carrying extra batteries for the radio, headsets, and lighted wands.
- Airtanker bases have designated areas for loading, fueling, maintenance, light fixed-wing, and day-off parking. For temporary bases, the base manager in conjunction with the RAMP will designate appropriate areas. Suitable tie-downs and chocks should be provided for aircraft.
- Ensure that taxi lanes to parking areas are sized to provide required wingtip to Object Free Area (OFA) for largest aircraft wingspan to use the taxi lane and parking area.
  - The OFA is the area that extends from the taxi lane or taxiway centerline to enhance the safety of aircraft movement in remaining clear of objects.
- RAMP will identify the area of responsibility for each FWPT. The FWPT will utilize hand signals and/or radio communication to direct the safe movement of aircraft, vehicles, personnel, and GSE within the assigned area.

- Have a contingency plan for unforeseen events that affect ramp operations.
- Ensure adequate staffing per the ABOP. Make requests for additional personnel as needed.
- Nose wheel positions should be marked on the pits for each airtanker type to ensure proper loading position and clearance. Consult local airport management for specific marking guidance.
- RAMP will establish radio communication with aircraft taxiing to the base and coordinate parking based on status (e.g., load and return, hold, fuel, out of service, etc.).
- The FWPT shall use the nationally standardized hand signals for marshalling aircraft. Refer to the Fixed-Wing Hand Signals (A-117) training module at <https://www.iat.gov/>.
- To increase FWPT visibility, utilize industry standard day wands where available. Each airtanker base should have several sets of day wands available. When wands are not available, the standard hand signals still apply.
- Ensure the nose/tail wheel is straight when the aircraft comes to a full stop.
- When propellers and engines have come to a full stop, the parking tender should place the chock on the appropriate wheel. Depending on the size of the tire and the size of the chock, it may be preferable to place the chock at a 45-degree angle to allow easier removal should the aircraft roll onto the chock. Once chocks have been placed, the parking tender should radio the pilot or use the “Chocks Inserted” hand signal to indicate the aircraft is chocked. When chocks are removed, use the “Chocks Removed” hand signal or radio the pilot. Wheel chocks should only be placed or removed per pilot direction or procedures from ABOP.
- Provisions should be made with local authorities to obtain adequate parking space to accommodate additional aircraft during periods of high fire activity.
- The FWPT will ensure that propeller/jet blast hazards are mitigated. See: Airtanker Ground Maneuvering and Parking Considerations for Temporary Bases and New Designs, <https://www.nwcg.gov/committee/airtanker-base-operations-unit>.
- Aircrews may make requests for retardant loads, fuel, and other logistical support through the ramp personnel. Relay all requests to appropriate personnel promptly.

## Wing Walking

Wing Walking is critical to airtanker base safety when the FWPT cannot see or judge the distances between the aircraft being parked and any obstacle nearby. Wing walkers add assurance to pilots as they taxi into parking areas that they have proper wing clearance to advance. Wing walking is a duty, not a position, but should be performed by FWPTs or other ramp personnel involved in the movement of aircraft.

- Wing walkers should shall be used anytime any part of a LAT/VLAT taxis within 30 feet of an object over 3 feet in height. SEATs and light fixed-wing aircraft may have different restrictions, refer to the ABOP.
- Aircraft will not be taxied where any part of the aircraft comes within 10 feet of an object over 3 feet in height. Ensure ample vertical clearance of wing and obstacles is observed.
- Do not allow any part of the aircraft to pass over any part of another aircraft.

- Wing walkers should understand their roles and responsibilities before undertaking the assignment. RAMP, FWPTs, and wing walkers shall brief on roles and responsibilities before performing operations requiring wing walkers.
- Wing walkers can be stationed at a fixed object or could be asked to walk with an aircraft to ensure its clearance from potential hazards and need to remain within the eyesight of the FWPT marshalling the aircraft.
- Wing walkers should focus on their area of responsibility and not on the aircrew or FWPT.
- Maintain depth perception awareness and watch for wing growth and tail swing as aircraft turn.
- It is the wing walker's responsibility to inform the FWPT marshalling the aircraft or pilot and stop the operation by crossing their arms in an Emergency Stop Signal and/or utilizing the radio before any part of the aircraft comes within 10 feet of an object over three feet in height.
- Stop an aircraft if unsure of clearances and assess the situation.

## **Low Visibility Ramp Operations**

During periods of low visibility on the ramp due to smoke, weather, time of day, or other limiting factors, additional safety measures should be implemented.

- While performing hand signals, FWPTs shall utilize industry standard lighted wands or glow sticks.
- Utilize wing walkers and ensure they also have lighted wands or glow sticks.
- Ensure personnel involved in aircraft movement utilize clear eye protection, ramp radios, and headsets.

## **Retardant Loading**

- Only properly trained personnel are permitted to conduct retardant loading operations.
- The base manager is ultimately responsible for the oversight of retardant operations.
- The RTCMs shall wear appropriate PPE.
- A briefing from the aircrew shall occur the first time the specific type of aircraft is loading from the airtanker base, annually. The briefing should include a review of the loading hose hook-up and removal processes along with any specifics of loading the aircraft. The FWPTs, RAMP, RTCMs, MXMS, and base manager should be involved.
- Retardant loading with propulsion engines running shall not be permitted except when all personnel involved have been trained on hot loading procedures and the airtanker base has an approved Hot Loading Plan.
- The loading hose shall not be connected to the loading port on the aircraft until that specific airtanker is to be loaded.
- Always notify the PIC if the aircraft is overfilled. Overfilling is defined as anytime the load exceeds the requested amount or contract weight. Under no circumstance may the load exceed contract weight, or STC limits.



- It is critical to flight safety that airtankers are not overfilled with out-of-specification retardant that exceeds the per gallon weight limitations.
- Before taxi, an overall visual safety check is to be conducted by all ramp personnel to identify anything out of the ordinary.
- Airtanker bases shall not allow the mixing/comingling of dissimilar WFC products. Do not intermix products from same or different manufacturers, other than minimal residual product remaining in airtanker tanks after dropping.

Comingling of same or different manufacturers' products may create a product that is not on the Qualified Product List (QPL) and may first require cleaning or wash down of affected systems prior to mixing/loading. Refer to National Technology Development Program (NTDP), <https://www.fs.usda.gov/rm/fire/wfcs>, for more information.

## Retardant Metering

- Loading retardant through a mass flow meter is required for USFS contracted LATs, VLATs and Modular Airborne Firefighting System (MAFFS) aircraft to ensure safety and efficiency. Anytime a SEAT is being loaded using a blender system (on-demand) a mass flow meter should be used. Knowing the actual weight of the retardant load placed on an airtanker is critical. Mass flow metering equipment provides the actual weight of the retardant in pounds.
- Each airtanker load should be measured individually to determine the precise weight placed on the airtanker. The base managers should ensure that procedures are in place to track and document the actual pounds loaded onto each airtanker, as well as converting the pounds to gallons for payment and incident cost tracking.
- Mass flow meters are used to load each Forest Service contracted airtanker and give the exact weight in pounds. These airtankers shall be loaded by weight with WFC that are within the density range listed on the Long-Term Fire Retardant characteristics and Mix Factors Table at [https://www.fs.usda.gov/rm/fire/wfcs/laqa\\_2.php](https://www.fs.usda.gov/rm/fire/wfcs/laqa_2.php).
  - Forest Service contracted airtankers must be loaded by weight to not exceed the approved amount. It is unacceptable to document and make payment for contract loads unless the mass flow meter has malfunctioned.
- If the mass flow meter becomes inoperative, the airtanker can temporarily be loaded using the visual indicators on the retardant tank along with close attention to the quality control procedures outlined for the product for the remainder of the operational period. Notify the PIC and appropriate agency aviation management personnel that airtankers are being loaded without a mass flow meter. Every attempt should be made to repair the mass flow meter immediately or consider utilizing a different pit or base. In the event the meter is unable to be repaired in a timely manner, back-up meters may be available through the National Interagency Support Cache System.
- Never load more than one airtanker at a time through the same meter, it does not provide an accurate measurement of the weight for each aircraft's load.
- Mass flow meters at airtanker bases must be calibrated, at a minimum, every 24 calendar months. Airtankers shall not be loaded if the mass flow meter has not been calibrated within the previous 24 calendar months.

## Retardant Testing

Follow direction given in the LAQA program and retardant contracts. Each airtanker base is expected to participate in the LAQA program. LAQA results shall be available as hard copies or shared electronic access for each base. Visit the LAQA webpage for more information.

[https://www.fs.usda.gov/rm/fire/wfcs/laqa\\_2.php](https://www.fs.usda.gov/rm/fire/wfcs/laqa_2.php)

## Retardant Offloading and Reloading

- Airtanker bases should maintain the capability of offloading and reloading retardant.
- Airtankers may need to be offloaded before ferry flights, mission currency flights, or before any maintenance that would require removing the retardant from the airtanker.
- Retardant should be reloaded if it remains within specification.
- Reloading through a mass flow meter is preferred; however, if one is unavailable for reloading from the offload tank, utilize the aircraft's load indicators while paying close attention to the quality control procedures outlined for the product.
- Care should be taken when loading airtankers which exceed the base's offload capacity. If operating airtankers whose tanks are larger in capacity than the offload tank, consider alternatives or contingencies in the event the entire load needs to be offloaded.

Airtanker bases shall not offload an airtanker with a different product than the airtanker base provides, in order to prevent mixing of dissimilar WFC products within the offload tank.

## Suppressants and Water Enhancer Loading

Reference the QPL for direction on which aircraft are approved for WFC products. Refer to the QPL for specifications, mix ratios, and qualified applications. Consult individual agencies for specific policies. Water enhancers (gels) shall not be loaded into Forest Service contracted airtankers. Refer to the *Interagency Standards for Fire and Fire Aviation Operations* (Red Book), Chapter 16, <https://www.nifc.gov/standards/guides/red-book>, for additional direction.

## Fueling

### Obtaining Fuel Services

The base manager should coordinate between the aircrew and the FBO to order fuel. If a Defense Logistics Agency (DLA) contract is available on the airfield the vendor with that contract shall be used. Refer to the local ABOP for specific fueling options.

For aircraft not currently authorized for DLA use, work with the National Airtanker Program Manager to obtain permissions. (i.e., aircraft from Canada, Australia, and Alaska).

DOI contracted aircraft are not part of the DLA Program.

### RAMP/FWPT Responsibilities

- Refueling operations are the responsibility of the contractor. The RAMP/FWPT will not participate in the fueling operations but will provide safety oversight while on the airtanker base ramp such as:

- Ensure no smoking or vaping within the fueling area.
- Be present during fueling operations.
- No cell phone or radio use within 50 feet of fueling operations.
- Ensure fuel trucks use chocks and bond to the aircraft.
- Be aware of location and use of emergency fuel shutoff valve.
- Refer to the ABOP for base specific procedures and responsibilities.
- The RAMP should ensure that all fueling operations are conducted in a secure area, without presenting an undue hazard to other aircraft or personnel.
- Once fueling operations are complete, the FWPT will notify the pilot that the area is clear, and the pilot can start the engines.

Some non-federal agencies may require RAMP/FWPTs to participate in fueling operations. Refer to the local agency for guidance.

### **Bonding**

Before making any fueling connections to an aircraft and fuel servicing vehicle, fueling equipment shall be bonded to the aircraft and fuel servicing vehicles by use of a cable, thus providing a conductive path to equalize the static electricity potential between the fueling equipment and the aircraft. The electrical bond shall be maintained until fueling connections have been removed. Reference the NFPA 407 Standards for Aircraft Fuel Servicing for specific bonding procedures and requirements.

### **Hot Fueling**

Certain aircraft operations may allow for the fueling of aircraft while engines are running, also known as hot fueling.

Refer to agency policy, guidelines, contracts, and local ABOP before commencing such operations.

### **Starting the Aircraft Engines**

Under normal circumstances, aircrews will not start aircraft engines without the authorization and presence of a FWPT. With base manager approval, after operating hours, maintenance personnel can oversee the engine start.

### **Clearing the Aircraft from the Loading Pit**

- After the loading is complete and/or the pump is shut down, the RTCM will close the loading valve, disconnect the loading hose, and move it, and themselves to the designated safe area.
- Before clearing the aircraft, the FWPT shall ensure the RTCM has replaced the retardant loading valve cap and overflow plug (if removed) and has pulled the loading hose completely clear of ramp.
- The FWPT will notify the pilot by radio or hand signal when the chocks are removed and the hose and RTCM are clear of the aircraft.

- The FWPT will take up a position that will allow a view of both sides of the aircraft and be in clear view of the pilot. The FWPT will then either use hand signals or communicate by radio that the engines are clear to start.
- The airtanker will be cleared to exit the loading pit after the FWPT has determined that all obstructions and hazards are clear of the aircraft and the RTCM is in the designated safe area free from propeller/jet blast.
- The FWPT will visually inspect the aircraft for leaks, open doors, extended ladders, open hatches, smoke, etc. and notify the pilot immediately if any anomaly is observed.
- Allow for at least one complete nose/tail wheel rotation before signaling the aircraft to turn.

## **Hot Loading**

The RAO/SAM or equivalent aviation manager has the final authority to approve or deny hot loading.

### **Purpose**

Hot loading is the loading of an airtanker while one or more propulsion engines are running, to reduce loading times and prevent adverse impacts on aircraft systems.

### **Applicability**

Hot loading shall be requested by the agency (base manager) on a case-by-case basis. Situations may occur where the aircrew or base manager elects not to hot load, even if approved.

Cooperator airtankers will have been evaluated and approved by the appropriate RAO/SAM for this purpose.

The contractor or a cooperator will document a risk assessment and operating practices for their airtanker and comply with those policies during this activity.

- For contractors, the risk assessment and operating practices will be provided to the Contracting Officer and reviewed by the National Airtanker Program Manager and the Branch Chief, Aviation Safety Management System.
- For cooperators, the risk assessment and operating practices will be provided to the appropriate RAO and reviewed by the Regional Aviation Safety Manager (RASM).

The DOI has authorized SEATs for hot loading, provided that each base has local aviation management approval and is identified in the base plan.

The hot loading procedure requires an approved airtanker base Hot Loading Plan, trained personnel, and concurrence by both the aircrew and airtanker base personnel. If used, it must be done properly and safely and be addressed in the local ABOP.

The airtanker base Hot Loading Plan shall be reviewed and approved annually by the appropriate level of the agency's aviation management.

### **Responsibility**

Each agency remains responsible for implementing safe and effective hot loading procedures for each authorized airtanker. The base manager is responsible for compliance with the requirements and procedures outlined in the local ABOP Hot Loading Plan. Airtanker loading operations are hazardous

under normal conditions, hot loading intensifies the degree to which personnel must adhere to the safety procedures in the Hot Loading Plan.

Training must be accomplished, using the most recent training materials, and base-specific hot loading procedures must be addressed in the local ABOP before hot loading operations can occur.

## **Procedures**

The following procedures shall be used for all hot loading operations for approved airtankers.

The first specific type of airtanker arriving at the base each season shall shut down all engines before hot loading at an airtanker base. Aircrews, ATBMs, SEMGs, ramp personnel, and RTCMs will review the following procedures and equipment specific to each aircraft:

- Hot loading procedures
- Hand signals/communication during hot loading
- Safety considerations

At the discretion of the base manager, airtankers may be required to shut down at any time to train personnel unfamiliar with the aircraft or the hot loading procedure for that aircraft.

### Procedures Specific to Hot Loading for All Aircraft:

- LATs: With the airtanker positioned in the loading pit, the pilot places the engine(s) at ground idle, then shuts down the engine(s) on the side from which the aircraft will be loaded.
- DC-10s: With the airtanker positioned in the loading pit, the pilot places the number two engine at ground idle, then shuts down the remaining engines.
- SEATs: With the airtanker positioned in the loading pit, the pilot places the engine at ground idle.
- S-2Ts: With the airtanker positioned in the loading pit, the pilot places the engines at ground idle.
- Airtankers are not chocked during hot loading unless the pilot requests it or the local ABOP dictates the procedures along with a risk assessment.
- Once the aircraft is secured, the pilot will inform the FWPT by hand signal or radio, that loading may begin.
- The pilot shall remain at the controls of the aircraft during hot loading procedures.
- There may be hot loading situations where radio communications between the pilot and FWPT are lost. Hot loading may be accomplished by the FWPT establishing eye contact with the pilot and utilizing standardized hand signals (see Appendix G, Standard Hand Signals for Airtanker Base Operations).
- RTCMs will approach and depart the aircraft only in the safety area behind the trailing edge of the wings. All loading operations must be conducted in this safety area.
  - MD-87s and DC-10s are the only airtankers safe to approach and conduct loading operations in front of the leading edge of the wings.

### FWPT Actions:

- The FWPT will take up a position providing the maximum view of the running engine(s), RTCMs, and cockpit.
- The FWPT will not allow anyone to approach the aircraft until the engine(s) have been shut down on the loading side and the propellers of propped airtankers have stopped windmilling.
- The FWPT must establish that the area is clear and receive approval from the pilot to begin loading.
- RTCMs will remain clear of the aircraft until the FWPT has given the signal to approach.
- If unauthorized personnel or equipment is observed approaching the running engine(s), the FWPT will immediately instruct the pilot to shut down the engine(s).
- Eye-to-eye contact and hand signals or radio communications between the pilot and FWPT will be maintained throughout the hot loading operations.

### **S-2T Specific Retardant Hot Loading Procedures**

The following are general procedures for the S-2T aircraft; refer to section 8336 of the CAL FIRE 8300 Aviation Handbook under Useful Resources at <https://www.nwcg.gov/committee/airtanker-base-operations-unit> for more specific guidance:

- During loading, the FWPT will have a visual of the PIC, loading operations, and both running engines.
- The FWPT obtains permission from the pilot to load when the aircraft is ready.
- The FWPT signals the RTCM the requested amount and to approach.
- The RTCM must ensure the Flapper Valve light is illuminated before loading.
- The RTCM observes the loading lights at the tail of the aircraft and if a mass flow meter is present, monitors the total pounds.
- When the load reaches within 200 gallons of the pilot's requested load or the aircraft warning horn sounds, the RTCM reduces the flow.
- When the load weight is reached and/or the top light illuminates, the aircraft is full, and the RTCM stops the flow.

### **SEAT Specific Retardant Hot Loading Procedures**

The following are general procedures for SEAT aircraft.

- The raised nose of the SEAT makes visibility directly in front of the pilot difficult.
- The FWPT will remain in position to see the turning propeller, pilot, RTCMs, and any other aircraft or personnel in the loading area. The best position is in front of and to the side of the engine. Avoid taking a position adjacent to the turning propeller/engine as this is a potentially dangerous area in the event of turbine failure.
- The pilot will normally indicate the desired load amount and will indicate when the appropriate load has been reached, often by hand signal only.

- When the pilot indicates the number of needed gallons over the radio the FWPT may be required to ensure the MXMS/RTCM are aware of the requested load.
- SEATs generally require loading at a reduced pumping rate (refer to the contract), compared to large airtankers, to avoid overloading, and provide adequate time for retardant quality assurance testing. Pump speed should be part of the initial briefing for SEAT pilots.

Specific planning documents for SEAT operations are available on the National SEAT website at <https://www.nifc.gov/about-us/our-partners/blm/aviation/seats>.

## **Simultaneous Fueling and Loading**

SEATs and S-2Ts are not authorized to simultaneously fuel and load.

The RAO/SAM or equivalent aviation manager has the final authority to approve or deny simultaneous fueling and loading.

### **Purpose**

Simultaneous fueling and loading is the process of fueling and loading retardant on an airtanker at the same time to reduce time on the ground.

### **Applicability**

Simultaneous fueling and loading shall be requested by the agency (ATBM) on a case-by-case basis. Situations may occur where the aircrew or ATBM elect not to simultaneously fuel and load, even if approved.

The simultaneous fueling and loading procedure requires an approved airtanker base Simultaneous Fueling and Loading Plan, trained personnel, and concurrence by both the aircrew and airtanker base personnel. If used, it must be done properly and safely and be addressed in the local ABOP.

The airtanker base Simultaneous Fueling and Loading Plan shall be reviewed and approved annually by the appropriate level of the agency's aviation management.

Cooperator airtankers will have been evaluated and approved by the appropriate RAO/SAM for this purpose.

The contractor or a cooperator will document a risk assessment and operating practices for their airtanker and comply with those policies during this activity.

- For contractors, the risk assessment and operating practices will be provided to the Contracting Officer and reviewed by the National Airtanker Program Manager and the Branch Chief, Aviation Safety Management System.
- For cooperators, the risk assessment, and operating practices will be provided to the appropriate RAO and reviewed by the RASM.
- Review the contractors risk assessments under Useful Resources, Airtanker Base Operations Unit, <https://www.nwcg.gov/committee/airtanker-base-operations-unit>.

## **Responsibility**

Each agency remains responsible for implementing a safe and effective simultaneous fueling and loading procedure for each authorized airtanker. The ATBM is responsible for compliance with the requirements and procedures outlined in the local ABOP's Simultaneous Fueling and Loading Plan.

Training must be accomplished, using the most recent training materials, and must be addressed in the local ABOP.

## **Procedures**

The following procedures shall be used for all approved airtankers.

Aircrews, ATBMs, ramp personnel, fuelers, and RTCMs will review the following procedures and equipment specific to each aircraft:

- Simultaneous fueling and loading procedures.
- Hand signals/communication during simultaneous fueling and loading.
- Fuel truck placement.

One shut down and one briefing per year per aircraft type can cover both hot loading and simultaneous fueling and loading procedures for each airtanker.

### Procedures Specific to Simultaneous Fueling and Loading for All Aircraft:

- The pilot shuts down all engines once parked in the loading pit. An onboard Auxiliary Power Unit (APU) may be in operation.
- Once the aircraft is secured, the pilot will inform the FWPT by hand signal or radio, that loading, and fueling may begin.
- A member of the aircrew/ground crew shall remain with the aircraft during simultaneous fueling and loading procedures to observe/supervise operations.

### FWPT Actions:

- The FWPT will take up a position providing the maximum view of the fueling and loading operations.
- The FWPT will not allow anyone to approach the aircraft until the engines have been shut down and the propellers have stopped windmilling.
- The FWPT must receive approval from the pilot or responsible crew member to begin fueling and loading.
- RTCMs and fuelers will remain clear of the aircraft until the FWPT has given the signal to approach.

### Fueler Actions:

Fuelers are responsible for observing and following the FWPT hand signals and fueling the airtanker safely and efficiently while avoiding the loading operations.



## Airtanker Specifics

In general, the procedures for handling all airtankers are similar regardless of size and number of engines. Airtankers shall not operate from airtanker bases unless the base has been approved.

### LATs

LATs refers to airtankers with a retardant capacity of 1,800 to 5,999 gallons.

Considerations for LATs:

- Propeller/jet blast can cause issues for anything that is behind the LAT.
- Increase spacing behind the LAT to allow for propeller/jet blast dispersion.
- Turning radius varies with each aircraft.

### VLATs

VLAT refers to airtankers with a retardant capacity of greater than 6,000 gallons.

Considerations for VLATs:

- Before a VLAT arrives, communicate with the airport and FBO to ensure there is an overweight authorization if needed, and to confirm the availability of GSE. Agency employees should not procure, operate, or maneuver GSE (refer to agency policy).
- Identify safe zones for staging GSE when not in use.
- VLATs using existing airtanker bases should not impact the LAT access to the pits or loading to include mixing and loading capacity.
- Increase spacing behind a VLAT to allow for jet blast dispersion.

### MAFFS

MAFFS are military C-130s on state and/or federal agreements to supplement the national airtanker fleet.

- Each MAFFS aircraft has a slip in unit that has a 3,000-gallon capacity and is a pressurized system.
- Refer to the MAFFS Operations Plan at <https://www.nifc.gov/nicc/logistics/reference-documents> for specifics on MAFFS operations.
- Site visits and preapprovals are required before operating MAFFS at an airtanker base. MAFFS must be addressed in the ABOP.
- Refer to the *NWCG Airtanker Base Directory*, PMS 507, <https://egp.nwcg.gov/egp/>, for additional information on MAFFS.

### Amphibious Water Scooper Aircraft (AWSA)

Amphibious Water Scooper Aircraft refers to both Single Engine Scoopers (SEATs with amphibious floats installed) and Multi-Engine Scoopers.

- The capacity for the multi-engine scooper (CL-215T/415) is 1,400/1,600 gallons and the single engine scooper is 799 gallons.

- Scoopers can be very effective when a suitable water source is near the fire.
- They can remain over the fire for up to 4 hours.
- The single engine scooper is authorized to deliver approved WFCs, however, the multi-engine scoopers are not.
- All scoopers will have a manager assigned, although they may be temporarily located at an alternate location. Single engine scoopers are managed by a SEMG that will remain on-site with the aircraft unless in travel status to their location.
- Single engine scoopers may need assistance with a parking location and minimal logistical support, prior to manager arrival.
- When using scoopers, care must be taken to minimize the potential spread of invasive species. Refer to the *Interagency Standards for Fire and Fire Aviation Operations* (Red Book), Chapter 11, <https://www.nifc.gov/standards/guides/red-book>, and the *Guide to Preventing Aquatic Invasive Species Transport by Wildland Fire Operations*, PMS 444, <https://www.nwcg.gov/publications/pms444>.
- Refer to agency policy for onboard mixing system use.
- Refer to the *NWCG Standards for Water Scooping Operations*, PMS 518, and local agency policies for further information.

## SEATs

SEATs refer to Single Engine Airtankers with a retardant capacity of 800 gallons or less.

Considerations for SEATs:

- SEATs have a short turning radius and can fit into small spaces.
- Use a wing walker when trying to fit SEATs in between LATs and any time the aircraft is within 30 feet of an object over 3 feet in height.
- Be aware of prop blast potential if parking SEATs behind LATs/VLATs.
- The raised nose of the SEAT makes visibility directly in front of the pilot difficult. The FWPT will remain in position to see the turning propeller, pilot, RTCMs, and any other aircraft or personnel in the loading area. The best position is in front of and to the side of the aircraft. Avoid taking a position adjacent to the turning propeller/engine as this is a potentially dangerous area in the event of turbine failure.

## SEAT Operations

### Wind and Turbulence Limitations for SEAT Operations

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.

Pilots should take into consideration wind and weather conditions (including crosswinds) at the base of operations prior to accepting a dispatch.

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.

### **SEAT Pilot Carded Ratings**

- All SEAT pilots shall be rated and carded as either a Level I or Level II, based on training, and experience. Refer to the agency aircraft contracts. For dispatch purposes it is important to understand the following requirements:

#### Level II Qualified Pilots

- Level II pilots are permitted to fly missions (1) without aerial supervision or an approved Level I Pilot Trainer in the fire traffic area with themselves plus one other aircraft, (2) with aerial supervision or an approved Level I Pilot Trainer in the fire environment airspace concurrently with multiple aircraft.
- Level II pilots must make it known to the aerial supervisor prior to entering the fire traffic area of the fact that they are a level II pilot. When no aerial supervision is on scene they must notify the incident commander. If no aerial supervisor or incident commander is present notify other aircraft on the fire and/or broadcast in the blind that they are a Level II.

#### Level I Qualified Pilots

- Level I (journeyman) permits pilots to fly missions in the fire traffic area with or without aerial supervision and to operate in a multiple tactical aircraft environment.

The above authorizations are subject to incident aerial supervision requirements found in the NWCG Standards for Aerial Supervision.

For more information refer to the SEAT services contract, the NWCG Standards for Aerial Supervision, and the Interagency Standards for Fire and Fire Aviation Operations.

### **Operations from Established Airtanker Bases**

SEATs may operate from the same facility as large airtankers. The SEAT contractor and SEMG (if present) must receive a complete briefing from the ATBM before conducting operations from an established airtanker base.

### **Emergency Procedures**

Airtanker base-specific emergency procedures shall be outlined in the local ABOP.

### **Situation Requiring Engine Shutdown**

If a situation requiring engine shutdown occurs, the FWPT will notify the pilot by radio or hand signal-drawing index finger across the throat.

### **Other Ramp Activities**

Items below are the general guidelines required for all airtanker bases. Refer to the local ABOP for specific direction.

## **Vehicles**

- Vehicles in the ramp/pit area must be kept to the minimum necessary for the operations.
- The base manager has the final authority to approve which vehicles will be allowed on the ramp.

## **Visitors**

- Before being allowed onto the ramp, visitors must obtain permission from the base manager or their representative and be given a safety briefing.
- Visitors shall always be escorted by agency or contractor personnel. When airport security requires, visitors will be provided a visitor ramp pass.
- If possible, members of the media should be escorted by a Public Information Officer.
- Visitors will remain clear of the ramp and retardant plant during operations.
- Members of the public shall be directed to and confined to a secure designated public viewing area while visiting the airtanker base to observe operations.

## **Retardant Jettison Areas**

Landing with full or partial load shall be in accordance with the contracting agency's policy and airtanker contract. The decision on landing with a full or partial load will be made by the PIC.

In the event of a cancelled or aborted mission after takeoff, the aircrew shall make the final decision as to whether the aircraft will land loaded or if a portion or all the load shall be jettisoned. SEATs, except when required by an emergency, are not to land loaded.

At any time during an emergency or when adverse conditions make safe landing uncertain, the pilot may drop all or part of the load, as necessary. Each base shall have a designated jettison area, coordinated with a local resource specialist to determine an acceptable location.

Indicate the location of jettison areas on the aerial hazard maps and include the latitude and longitude of the sites in the local ABOP, pilot briefing, and orientation guide, and the *NWCG Airtanker Base Directory*, PMS 507, <https://egp.nwcg.gov/egp/>.

Some units may require jettison load tracking. Each base should have some form of documentation identifying location, product, and quantity.

## **Proficiency or Mission Currency Training Flights**

To maintain aircraft and aircrew readiness during the contract period, the agency in certain situations may allow pilot proficiency or mission currency training flights. Reference agency policy and aircraft contracts for specific direction.

### **Mission Currency Training Flights (SEATs)**

MCTFs are at the sole discretion of the agency and 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, and air-to-air, and air-to-ground communications.

Refer to the SEAT contract for specific guidance.

## **Pilot Proficiency Flights (SEATs)**

Pilots must be proficient when starting the contract. It is the contractor's responsibility to provide proficient pilots. Proficiency flights may be conducted while the pilot and aircraft are under contract with approval from the local agency managers. The SEMG will inform dispatch of any proficiency flight activity.

Availability will not be affected during proficiency flights. Flight time may or may not be paid by the agency; however, will be counted towards the flight time for the day.

Refer to the SEAT contract for specific guidance.

## **Retardant Operations in Low Light Conditions (Sunrise and Sunset)**

Each airtanker base and dispatch office shall have official charts showing the official sunrise and sunset times at those locations. Official sunrise/sunset for the airtanker base nearest the incident shall be used to determine startup and cutoff times for the incident, with input from the pilot.

For startup/cutoff times for multi-engine airtankers, refer to the *NWCG Standards for Aerial Supervision*, PMS 505, <https://www.nwcg.gov/publications/pms505>.

SEAT operations are limited to flight during the official daylight hours. Daylight hours are defined as 30 minutes before official sunrise until 30 minutes following official sunset and under visual flight rule conditions [Federal Aviation Regulations (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, ASM, or Lead Plane because of low visibility conditions caused by smoke, and/or shadows.

## **Chapter 08 – Safety**

Safety at airtanker bases and around aircraft is the responsibility of base managers, supervisors, flight crews, ground crews, agency, and contracted personnel. Safety is an organizational and individual responsibility and in no circumstances should the safety of employees be compromised.

It is the base manager's responsibility to ensure risk assessments and/or Job Hazard Analysis (JHAs) are updated and available at the base.

### **Mitigating Risk**

The primary way in which we prevent accidents in wildland fire and aviation operations is through active risk management. Although we must accept that aviation operations have an inherent risk, it is incumbent upon us all to mitigate that risk to an acceptable level. Through organized, comprehensive, and systematic risk management, we can determine the acceptable level of risk that will allow us to provide for safety while still achieving our objectives.

There are many ways to complete the risk assessment process, including JHA/Risk Assessment Worksheets, Safety Management System (SMS) programs, Daily Operational Risk Assessments, and daily briefings. Refer to agency aviation safety management plans.

Risk Assessments have been created specific to hot loading and simultaneous fueling and retardant loading by each large airtanker vendor and agency assessments for Large Airtanker Operations, SEAT

Operations, and Airtanker Base Operations. These are available at Resources, Airtanker Base Operations Unit, <https://www.nwcg.gov/committee/airtanker-base-operations-unit>.

### **How to Refuse Risk**

All individuals (agency and contracted employees) have the right and obligation to report safety problems affecting their safety and have the right to contribute ideas to correct the hazard. Every individual also has the right to turn down unsafe assignments. A “turn down” is a situation where an individual has determined they cannot undertake an assignment as given and is unable to negotiate an alternative solution. The turn down of an assignment must be based on an assessment of risks and the ability of the individual or organization to control or mitigate those risks.

When an individual feels an assignment is unsafe, they also have the obligation to identify, to the extent possible, safe alternatives for completing that assignment.

Refer to the *NWCG Incident Response Pocket Guide (IRPG)*, PMS 461 for information on How to Refuse Risk.

Mission turn downs for federally contracted airtankers should be documented or reported by the aircraft manager/airtanker base manager via the mission turndown form found on the Airtanker Base Operations Unit website: <https://forms.office.com/pages/responsepage.aspx?id=5zZb7e4BvE6GfuA8-g1Gl-mf0A-oWjlPnP4rpKv8TqBUNzhXWUNFODFIS1A1R0RXNU9ETloxR0RYTC4u&route=shorturl>.

## **Occupational Safety and Health Administration (OSHA)**

### **Workplace Safety**

Agencies are responsible for assuring that facilities meet local, state, and federal laws pertaining to workplace safety for employees and do not impact the welfare of the surrounding community. OSHAs “General Duty Clause” standards will be followed in all cases.

Refer to the OSHA website <https://www.osha.gov> for more information.

### **Hazardous Material Requirements**

Refer to the OSHA website, <https://www.osha.gov/dsg/hazcom/> for information that pertains to OSHA hazardous material compliance.

### **Airtanker Base Evaluations**

The base manager assigned to an airtanker base shall evaluate it on an annual basis utilizing Appendix M, Airtanker Base Readiness Review, or similar document/process. Refer to agency policy, checklists, and the *Interagency Standards for Fire and Fire Aviation Operations* (Red Book), located at <https://www.nifc.gov/standards/guides/red-book>.

Periodically, and generally during periods of extended or high activity, Fire and Aviation Management may elect to conduct a “Quality Assurance Audit.” This type of evaluation may consist of many of the same elements as the Airtanker Base Readiness Review. In addition, the auditors may interview the aircraft crews to ensure contract compliance. The intent of this type of evaluation is to engage with personnel to determine if there are issues that need to be addressed and to monitor the overall safety and health of the operations.

## Use of the Evaluation

The evaluation checklist can be used for both pre-season and as needed spot evaluations of airtanker bases. The results of the evaluation should be reviewed with the fire staff of the agency operating the airtanker base and any cooperators. Deficiencies in training should be corrected within a reasonable time frame. Deficiencies in critical areas of safety must be corrected immediately. Completed evaluations will be provided to forest, state, and regional offices for review and line officer accountability.

## Evaluation Team

Where possible, the evaluation team should be interagency in nature. Airtanker base SMEs should be part of the team.

## Known Aerial Flight Hazard Maps

Each airtanker base shall have a map noting known aerial hazards within its zone of influence posted prominently for use by aircrews.

The map shall be updated annually and as needed with the last revision date indicated on the map.

The hazard map shall include the following:

- Power lines and towers. If aeronautical charts are being used (e.g., Sectionals), then these hazards should be highlighted on these charts.
- Wires and power lines not marked on standard aeronautical charts.
- Military Training Routes (MTRs), Military Operation Areas, Restricted Areas, Sensitive Areas, and other Special-Use Airspace.
- Identifiable areas of known turbulence or avoidance.
- Additional hazards specific to your area such as hang gliding, skydiving, soaring, etc.
- A key to identify the type of hazard.

The base manager is responsible for ensuring that briefings concerning local known aerial hazards are completed for all assigned crews.

## Airspace Coordination

Information about Temporary Flight Restrictions (TFRs) and MTR, Notices to Airmen (NOTAM), Fire Traffic Area (FTA), and additional information should be posted at the airtanker base and communicated to aircrews.

If air operations in support of an incident are becoming complex or unsafe at an uncontrolled airport, there may be cause to order a temporary control tower. Refer to the *National Interagency Standards for Resource Mobilization*, <https://www.nifc.gov/nicc/logistics/reference-documents>, for specific guidance on ordering a temporary control tower. Potential reasons to order:

- Excessive smoke/visibility.
- Pilot request.
- Congested airspace.

Benefits of a temporary control tower are aircraft separation, coordination within the airspace, enhanced aviation safety, and coordination of approach and departure for aircraft.

The *NWCG Standards for Airspace Coordination*, PMS 520, <https://www.nwcg.gov/publications/pms520>, is a good resource for additional information on airspace issues and concerns.

## **Emergency Response Planning and Equipment**

The capability and knowledge to activate trained emergency response personnel quickly should be a top training priority.

### **Emergency Response Planning**

- Each airtanker base shall develop and annually update an emergency response plan. Local airfield and community capability to respond to aircraft accidents and/or fuel fires should be built into the plan.
- The plan shall be prominently posted.

Airtanker base personnel shall be familiar with and trained in how to use the plan and contact emergency services in the event of an emergency on or off the airfield.

Each airtanker base should conduct emergency response training and simulations based on the emergency response plan. Training will simulate an actual aircraft or other accident on or near the airtanker base. The emergency response plan shall outline roles and responsibilities for all base personnel. Emergency response training and simulation are required for USFS airtanker bases.

### **Emergency Procedures**

In case of a ramp emergency, the aircrew shall be notified by radio or hand signals of the type of emergency.

Fire: Aircrew will be notified by radio or hand signal and fire extinguisher will be staffed for aircrew protection. Appropriate base procedures will be followed. Ramp personnel will not discharge a fire extinguisher directly into an engine unless directed to do so by the pilot.

Communication Loss: If radio communications are lost, the RAMP/FWPT will establish eye contact with the pilot and pat the earphones followed by a thumbs-down signal. Loading and/or fueling operations should pause until the radio problem has been identified and corrected.

Engine Shutdown: In the event any situation requiring engine shutdown occurs, the 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.

### **Emergency Response Equipment**

#### Fire Extinguishers

The purpose of portable fire extinguishers located on an aircraft ramp is to:

- Provide initial firefighting, commensurate with training, and PPE.
- Assist the aircrew at their exit point from the aircraft.



- An external fire extinguisher should never be used on an engine fire while the engine is running. The PIC may elect to either blow out an exhaust stack fire or extinguish an intake fire using onboard aircraft system fire extinguishers.

29CFR 1910.157 requires monthly visual inspections and an annual maintenance check of all portable fire extinguishers. This code also requires annual training on the use of portable fire extinguishers and the hazards involved with incipient stage fire fighting for all employees.

### Extinguisher Sizing

- Airtanker bases will have at a minimum, one 20B:C fire extinguisher located immediately adjacent to each loading pit and fueling area(s). Follow agency guidelines if more stringent.
- Contractors performing aircraft maintenance must follow the NFPA 410, Standard on Aircraft Maintenance.
- Fuelers performing aircraft fueling must follow the NFPA 407 Standard for Aircraft Fuel Servicing.
- The OSHA, under 29CFR 1910.157, Portable Fire Extinguishers, sets requirements for use, testing, and maintenance for fire extinguishers provided from employers to employees.
- NFPA 10, Standard for Portable Fire Extinguishers, sets the inspection, and maintenance standards.

### Local Emergency Response Organization

Local emergency response equipment and procedures for activation shall be included in the emergency response plan and in the local ABOP. The plan should also address the responsibility and chain of command in the event of an on-field accident or fueling mishap.

Supplemental emergency response equipment, if not available on the airfield or if it is needed to supplement local fire departments, should be ordered through the dispatch system during periods of high activity. Base managers may also utilize an Emergency Equipment Rental Agreement (EERA) through the local fire agency. Base managers can place an order with the local agency dispatcher for an Aircraft Rescue and Firefighting (ARFF) Unit whenever multiple airtankers operate from the airtanker base for extended periods of time.

### **NFPA Standards**

The NFPA has developed standards to establish reasonable minimum fire safety requirements for procedures, equipment, and installations for the protection of persons, aircraft, and other property during ground fuel servicing and basic operations that involve liquid petroleum fuels. Reference current editions of the following:

- NFPA 10 Standard for Portable Fire Extinguishers,
- NFPA 407 Standard for Aircraft Fuel Servicing,
- NFPA 408 Standard for Aircraft Hand Portable Fire Extinguishers,
- NFPA 412 Standard for Evaluating Aircraft Rescue and Fire Fighting Foam Equipment,
- NFPA 410 Standard on Aircraft Maintenance.

## **Hazard, Incident, and Accident Reporting**

All hazards, incidents, and/or accidents shall be reported promptly per agency-specific notification requirements. The SAFECOM system, <https://www.safecom.gov/>, is the method for reporting aviation-related incidents involving federal aircraft or federal jurisdiction. Cooperating agencies may have an alternate reporting system.

Personnel reporting an incident and/or accident must remember that it is officially reported to the agency that has operational control of the aircraft at the time of the occurrence. This may or may not be the agency that owns or has contracted the aircraft.

In the event of an accident, incident, or near-miss during ground maneuvering at an airport, submit a SAFECOM identifying the situation, outcome, and lessons learned. Make notifications as required.

## **Airtanker Base Retardant Plant Safety Requirements**

Airtanker base retardant plant safety requirements should be covered extensively during the annual inspection process. OSHA's General Duty Clause 29USC 654 Section 5(a)(1) requires that each employer furnish to each of its employees a workplace that is free from recognized hazards that are causing or likely to cause death or serious physical harm. Some examples of compliance are:

- A permanent ladder and safety railings shall be on all walkways on tanks.
- Skid-proof paint shall be applied to all walkways on tanks.
- Pump shafts shall have guards.
- All electrical equipment shall be properly grounded.
- Cautionary signs (no smoking, hazardous area, no entry, etc.) shall be posted.
- Mitigate slips, trips, and falls.
- Eyewash and emergency shower facilities must be provided. The OSHA standard is within 50 feet of the hazard. (CFR 1910.151).

## **Personal Protective Equipment (PPE)**

It is the base manager's responsibility to ensure personnel are trained in the use of PPE. If respirators are used at an airtanker base during mixing operations, an OSHA Respirator Plan must be in place.

### **Ramp Personnel**

All ramp personnel, including RTCMs, working on the ramp shall wear ear and eye protection, as well as high visibility clothing. PPE for skin protection against sunburn, propellor/jet blast, and blowing rocks/sand should be considered. Footwear with closed-toe and non-skid soles shall be worn while working on the ramp during operations.

### **RAMP/FWPT/RTCM Identification**

In addition to the above-mentioned PPE, the RAMP shall wear and be identified by a high visibility green vest/shirt, and the FWPTs shall wear a high visibility orange vest/shirt. At bases with dedicated RTCM personnel, the loaders should wear high visibility blue vest/shirt.

## Audio Levels

Audio levels on the ramp can be extremely high during operations, base managers shall ensure appropriate hearing protection is available and worn. If OSHA standards are exceeded, additional protective measures must be taken.

See Hearing Safety at Airtanker Bases, <https://www.fs.usda.gov/t-d/pubs/pdf/99571205.pdf>, US Forest Service, National Technology and Development Program (NTDP), San Dimas, California, 5700 Aviation September 1999-9957-1205 SDTDC.

Airtanker base personnel will participate in the local hearing conservation program.

## Chapter 09 – Administration

Refer to Appendix N, Recommended Reference Library, for publications, and reference materials needed at airtanker bases. Base managers are responsible to maintain an updated library.

Forms listed in Appendix O, Administration Forms, and Reports, will provide a base manager with the means to maintain an accurate record of airtanker base operations.

USFS Airtanker Program QR Code Menu, for notification reporting, <https://www.nwcg.gov/committee/airtanker-base-operations-unit>.

### Administrative Reporting Instructions

The proper completion of agency flight payment documents is critical to the accurate and timely payment to vendors. Follow the procedures in agency policy on specifics for payment documentation. Airtanker administrative Contracting Officers Representatives (COR) rely on the timely and accurate incident and flight information reporting to input into the required database. By the close of business (COB) each day, the administrative COR should have all the day's information including but not limited to: on and off duty times, any unavailability times, any movement or flight activity with validated order numbers and job codes, any issues with the aircrew or aircraft, etc.

FLIGHT data entry is encouraged for all airtanker bases regardless of ownership but is required for Forest Service and Bureau of Land Management (BLM) bases and Forest Service and BLM contracted and ordered airtankers. Aircraft used on USFS and BLM lands shall be recorded in FLIGHT (including MAFFS and cooperator/international airtankers). Follow agency direction.

The SEAT Daily Ops Worksheet shall be completed each day, regardless of activity, for each SEAT on contract. The worksheet will be sent to the National SEAT Coordinator (SECO) and the assigned Project Inspector by 10:00 am Mountain Time (MT) at [blm\\_fc\\_seat@blm.gov](mailto:blm_fc_seat@blm.gov).

## **Incident Cost Reporting**

Incident cost reporting is crucial and mandated by the Office of Management and Budget (OMB). It is vital that by COB each day all fixed-wing costs for the incident are sent to the appropriate incident, unit, etc. Base managers should not only be capturing airtanker cost, but also light fixed-wing costs out of the airtanker base to include in the total fixed-wing cost report.

## **Airport Fees**

Airport utilization fees may include landing, parking, fuel flow fees, and tie-down fees. The local ABOP shall address specific airport fees and how to deal with them appropriately, also refer to aircraft contracts on applicable fees that may be reimbursed through contract payment methods.

## **Contract Administration**

### **Roles and Responsibilities**

#### Contracting Officer (CO)

The CO is responsible for all contracting actions including contracting procedures, contract legality with existing laws and regulations, contract administration, and termination.

The CO is the only individual who may modify or change a contract provision.

#### Contracting Officer's Technical Representative (COTR)

The COTR is appointed by and directly responsible to the CO for assuring compliance with the technical provisions of the contract. The COTR conducts initial contract compliance inspections of the vendor's equipment, facilities, and personnel before, and periodically during the performance period.

COTRs from both DOI Office of Aviation Services (OAS) and USFS can assist with technical support for both agencies, particularly when dealing with maintenance issues and inspections.

#### Aviation Maintenance Inspector (AMI)

An AMI is responsible for managing the inspection and approval of fleet and contract aircraft and related equipment, including ensuring compliance with contractual and FAA requirements.

Every contract for aircraft other than point-to-point requires the vendor to contact the AMI before being returned to contract availability. This is because an aircraft that is removed from contract availability due to maintenance is not in compliance with the contract specifications for an airworthy aircraft.

Under policy, the only individuals that have the authority to assess the aircraft's airworthiness under the contract are AMIs.

**Return to Contract Availability (RTCA):** When an aircraft is removed from contract use and declared "out of service" for aircraft maintenance purposes, the process for returning the aircraft to contract availability by the agency is as follows:

- USFS Maintenance "Approval for Return to Service."
  - When Forest Service contracted aircraft go "unavailable" due to a maintenance issue, the contractor must contact the USFS Aviation Maintenance Inspector (AMI), coordinated with / through the agency COR/Base Manager, before being returned to contract availability. This

is a collaborative process between the COR/ Base Manager, AMI, and the contractor. Proactive communication is the key.

- The following Forest Service Policy and Guide establishes the requirement for this process:  
FSH 5709.16, 42.11 – Aircraft Return to Use after Maintenance: Contracted Aircraft.  
Contractor authorized aircraft maintenance personnel must approve for “return to service” for all contracted or leased aircraft with mechanical or equipment deficiencies.  
A Forest Service approved aviation inspector (AMI) must approve the aircraft for “Return to Contract Availability.”  
Depending on the complexity of the maintenance or repair, “Return to Contract Availability” approval may be given verbally with an electronic follow-up.
- The Forest Service Aircraft Inspector Guide (AIG) ([https://www.fs.usda.gov/sites/default/files/2020-12/18-278212\\_aig\\_final\\_pre\\_policy\\_rev\\_6\\_28\\_2018\\_spf\\_letter\\_reduced.pdf](https://www.fs.usda.gov/sites/default/files/2020-12/18-278212_aig_final_pre_policy_rev_6_28_2018_spf_letter_reduced.pdf)) describes the process in Chapter 11, “Return to Contract Availability (RTCA).”

*“The appropriate Agency AMI should be contacted for approval for return to contract availability for any unscheduled maintenance. Most of the time inspectors will be able to do this over the phone. The normal practice under these circumstances is to either have the contractor send copies of the log entries for inspector review, or have the manager retain the copies with their daily diary. Some inspectors want copies of all repairs, while others only keep them for major items. It is a judgement call on the inspector’s part which way to handle it, and whether they need to re-inspect an aircraft. As a minimum, copies of the logs for these type repairs should be retained by the COR or base/aircraft manager with their diaries.”*

The above policy and guide requirements are the basis for the contract requirement for return to contract availability. For Airtanker RTCA, single points of contact for each make/model of airtanker have been assigned. The current list is available at <https://www.nwcg.gov/committee/airtanker-base-operations-unit>.

- The agency COR/base manager must notify the appropriate AMI before the aircraft is returned to contract use.
- Use the following form to report an airtanker out of service: Useful Resources, <https://www.nwcg.gov/committee/airtanker-base-operations-unit>.
- Process for returning a DOI SEAT to Contract Availability:

Refer to the DOI SEAT Services contract Section C20.1-C21.3 for reference.

The vendor must immediately notify the COR and COTR of any changes to any engine, power train, flight control or major airframe component or any major repair following an incident or accident and must describe the circumstances involved.

DOI Contracts do not require an aircraft to be returned to availability by a DOI/USFS approved AMI after routine maintenance. The vendor returns the aircraft to “service” after routine maintenance is completed with a logbook entry by the mechanic and by the pilot if a test flight

was required. The SEMG or ATBM returns it to “contract availability” when notified by the vendor that they are back in service.

The ATBM/SEMG must contact a DOI OAS inspector (COTR) and COR anytime the aircraft is taken out of service and has a deficiency for the following:

- Any unscheduled maintenance action requiring a post-maintenance test flight for the purpose of ensuring discrepancy correction.
- Anytime the manufacturer requires a Conditional Inspection be performed, e.g., hard landing, blade, or prop strike, sudden stoppage, engine over-speed, engine, or transmission over temp, over-torque, engine compressor stall, or surge.
- Any condition affecting flight control maneuverability or responsiveness.
- Any un-commanded jettison of retardant loads.
- Malfunctioning of vendor-provided equipment such as retardant gates, radios, etc.
- Any repair following an incident or accident.

Depending on the magnitude of the deficiency, the COR, and/or COTR may also require a physical inspection by an OAS inspector.

Per C21.1.3 once the documented evidence is approved by the COTR, the COR will consider the contractor available from the time the contractor notified the COR of their availability. If the COTR requires additional actions from the contractor, the COR will consider the contractor available from the actual date that all deficiencies were corrected and approved by the COTR.

Contact the OAS inspectors for the region:

- Eastern Region/Atlanta, GA: 770-458-7474
- Western Region/Boise, ID: 208-334-9310
- Alaska Region/Anchorage, AK: 907-271-3700
- State Contracted Aircraft: Follow State-specific policies for return to contract availability.
- A SAFECOM is used to report any condition, observation, act, maintenance problem, or circumstance with personnel or the aircraft that has the potential to cause an aviation-related mishap. Consultation with a DOI/USFS approved Maintenance Inspector before submission is encouraged.

### Contracting Officers Representative (COR)

The COR is appointed by and directly responsible to the CO for monitoring contract performance.

The COR is primarily responsible for assuring compliance with the provisions of the contract.

The COR maintains communications with the vendor concerning day-to-day operations, though this may be further delegated to the Project Inspector (see below). The COR may not modify the price or provisions of the contract.

The COR may recommend to the CO proposed changes and adjustments to the contract to meet the demands of the work project assignment. These proposals will be coordinated with the agency Airtanker Program Manager. The COR may discuss changes or modifications in equipment or other requirements of the contract, but may not commit the agency to such changes, modifications, or adjustments without going through the CO.

The COR is responsible for verifying the work performed upon which payment is based. Refer to the current Schedule of Items for specifically assigned personnel and contact information. Consult with state agency representatives for personnel that may be assigned this responsibility for state contracts.

The COR should maintain a contract file. This file should consist of a minimum of the following:

- A copy of the contract with all contract modifications.
  - Delegations of authority.
  - A bid price summary that specifies contract costs for all pay items.
  - Copies of flight payment documents.
  - Copies of all contract daily diaries.
  - Correspondence to or from the CO/Project Inspector (PI) and vendor.

#### Project Inspector (PI)

A PI may be designated by the COR/CO to assist in implementing the COR's instructions as delegated. Responsibilities of the PI are delegated by the COR and will generally include:

- Verifies services performed by the vendor.
- Ensures vendor's compliance with the contract specifications and provisions.
- Discuss daily work assignments and ordering service within the contract provisions.
- Discuss problems that occur with the vendor and recommending proposed solutions to the COR.
- Maintains Daily Diary with documentation of the administration of the contract. Any problems of a serious nature are brought immediately to the attention of the COR.

#### Operating Base Manager

- Administration of the contract is a joint responsibility of the host airtanker base and the COR, with the ultimate responsibility vested in the CO. Administrative functions are generally delegated to a local level.
- All airtanker base personnel must understand that only the CO may alter the terms and conditions of the contract. Agency employees must understand that the contractor and company employees are bound only by the conditions as outlined in the contract and operate under the policy and guidelines of the contracting agency regardless of incident jurisdiction or land ownership.
- Airtanker base personnel should be familiar with all applicable aviation contracts, as well as the National Retardant Contract. Copies of these contracts should be maintained in the airtanker base reference library. Airtanker bases which utilize cooperator aircraft should maintain a current copy of the applicable contract.

- The base manager is responsible for providing contract administration oversight of each federal and state airtanker operating out of the airtanker base. The base manager must be familiar with the contract as there may be conditions or modification items unique to a particular contractor or aircraft, which differs from standard contract provisions.
- The base manager should periodically confirm that the pilot and aircraft cards are valid and current. On occasion, the base manager may be expected to perform a pre-use inspection.
- Personnel who are responsible for administering contracts within their delegated authority should document all actions taken concerning the contract.
- Usually, a SEAT is assigned to a SEAT Manager (SEMG); however, when SEATs are operating out of an existing airtanker base without a SEMG, the ATBM is responsible for administrative forms and contract oversight. ATBMs and SEMGs managing SEATs may refer to DOI National SEAT services contract for specific language and designation in Section C. Also, refer to the BLM SEAT webpage for additional information on pay item codes, pay documents, and additional information <https://www.nifc.gov/about-us/our-partners/blm/aviation/seats>.
- Contact the COR for communication expectations regarding the aircraft and its crew.
- Notify the COR with any challenges with the aircrew or aircraft.
- Anytime an airtanker goes out of service, the base manager shall immediately notify the local dispatch center (who will notify the respective GACC), and complete the Out-of-Service form found at: USFS Airtanker Program QR Code Menu, <https://www.nwcg.gov/committee/airtanker-base-operations-unit>, which will notify the COR and AMI. Once the airtanker has been returned to service by the vendor, the base manager will get confirmation of the RTCA from the AMI and then notify the local dispatch center (who will notify the respective GACC) and COR.

## Records Retention

Follow local agency guidelines for records retention. The CO can help determine which files they believe should be part of the contract file for record-keeping purposes.

Reference –FAR 4.805 <https://www.acquisition.gov/far/4.805>.

## Types of Contracts

Exclusive Use contracts are those awarded for a specific time (e.g., 30-day, 90-day, etc.), during which the contracting agency has exclusive use of the aircraft and/or retardant services.

Call-When-Needed/On-Call contracts are those contracts that allow the agency to order additional aircraft services during periods of high aircraft use.

States, counties, or other municipalities may have similar contracts or agreements, which are unique to that entity. Consult with the appropriate contract specialist for assistance.

During periods of high incident activity, aircraft from Canada and Australia may be used within the United States. Information about these aircraft may be found in the *National Interagency Standards for Resource Mobilization*, or other specific documentation issued with the mobilization of these aircraft.



## Authority of Agency Personnel

Before any person takes contractual action on behalf of the respective agency, they need to ascertain whether the authority to act has been delegated to them in writing. Consult with the appropriate agency representatives for their policy on contract administration.

## Disputes with Vendors

Disputes that cannot be readily resolved at the local level by the base manager, PI, and/or COR will be referred to the CO. Documentation of the resolution of actions taken in any dispute is important to assure that the interests of the agency are maintained.

# Chapter 10 – Environmental Issues

## Wildland Fire Chemicals (WFC) Dropping in Sensitive Areas

Follow agency guidelines regarding WFC avoidance areas and what to do in the event of the misapplication of fire chemicals. Reference *Interagency Standards for Fire and Fire Aviation Operations* (Red Book), Chapter 12, <https://www.nifc.gov/standards/guides/red-book> and the local ABOP for additional guidance and reporting requirements.

For SEATs, when switching from fire chemicals to water loads, the tank should be rinsed thoroughly before filling with water. Refer to agency policy.

## Spills

Work with the unit's hazardous materials coordinator or equivalent to develop specific spill response and cleanup procedures to include in the local ABOP. Bases should have and maintain a spill containment kit that can be deployed in the event of a small spill. Follow the applicable Stormwater Pollution Prevention Plan (SWPPP) if in place.

Special precautions must be taken to contain potential spills while the airtankers operate on the ramp. Retardant loading pits must have containment and treatment systems to handle leaks, spills, and/or wash down water that may contain metals, fuel, hydraulic fluid, oils, etc. from the aircraft. Additionally, mixing and pump areas and storage tanks must have containment systems in place if spills or leaks may impact the surrounding airport environment, storm drains, or mineral soil.

In areas where retardant deliveries are received, aircraft maintenance is performed or on the ramp where loaded airtankers are staged for dispatch, a containment system, or barriers should be in place. At a minimum, storm drains that may be affected by a spill, should be sealed with commercial containment rubber mats or straw bales.

Mineral soil should be protected from potential retardant releases, leaks, or wash down water by concrete collection structures, curbing, or temporary barriers. Spills in these areas must be collected and disposed of per agency policy and/or direction as identified in the local ABOP.

Spills of retardant, fuel, oil, cleaning liquids, etc. must be cleaned up as soon as they occur. A pre-season contact should be established with a certified hazardous material disposal service to mitigate any spills at the airport. Many state and federal agencies have national and local contracts in place that can be accessed through agency engineering, environmental, or health, and safety offices.

Local jurisdictions may consider spills and wash down water acceptable to the facility and can be distributed into storm drains or dispersed on the ground. However, federal/state regulations and agency

policies dictate that airtanker bases comply with proper spill prevention, collection, treatment, and disposal. For local procedures refer to the local ABOP, or SWPPP if in place.

## **Fuel Spills**

All spills will be reported to the appropriate authority immediately. Refer to local ABOP.

Procedures for handling fuel spills are subject to the regulations and procedures established by the authority having jurisdiction over airport operations.

If a fuel leak develops or a fuel spill occurs during aircraft servicing, follow the guidelines in the local ABOP and initiate the following emergency procedures without delay:

- The flow of fuel should be stopped, if possible.
- The airport fire crew should be notified if the spill presents a fire hazard.
- It could be necessary to evacuate the aircraft if the spill poses a serious fire exposure to the aircraft or its occupants.
- Mobile fueling equipment and all other mobile equipment should be withdrawn from the area or left as is until the spilled fuel is removed or made safe.
- Aircraft, automotive, or spark-producing equipment in the area should not be started before the spilled fuel is removed or made safe.
- If any aircraft is operating at the time of the spill, move the aircraft away from the hazard if it can be done safely.
- If the leak continues or the spill is a large one, all nonessential personnel should leave the area immediately until the hazard is neutralized, repairs are made, and the area is safe.
- If the aircraft is leaking fuel, contact the AMI as soon as possible.

Never operate an electric truck or cart near a fueling operation or fuel spill. The speed controller can be an ignition source.

During any spill or leak, extreme caution must be exercised to avoid actions that could provide ignition of the fuel vapors.

Reference International Fire Service Training Association: Aircraft Rescue and Firefighting (ARFF):

- During small or medium static spills (not over 10 feet in any dimension or over 50 square feet in area) a Firewatch, as assigned by the RAMP, should be posted with one or more fire extinguishers with at least a 20B:C rating. Local regulations and procedures must be followed. However, in most cases, absorbent materials, or emulsion compounds should be used to absorb the spilled fuel, especially if aviation gasoline (Avgas) or low flashpoint fuels are involved.
- The contaminated absorbent should be picked up and placed in an approved container to await disposal.
- Aircraft fuels will damage some types of ramp surfaces. Spilled fuel should be contained and cleaned up as quickly as possible.
- Large spills (over 10 feet in any dimension or over 50 square feet in area) or smaller spills continuing to enlarge should be handled by the fire department, or if in a remote location, by a ground engine. Anyone in the area of a large spill should move upwind of the spill immediately.

- All fuel spills occurring as a result of a collision should be blanketed with foam to prevent ignition and to prevent damage to the aircraft or additional exposure.

If the fueler's clothing becomes wet with fuel, the base manager should:

- Evacuate personnel from the fueling area.
- Shut down the fueling if the fueler is unable to.
- Provide the individual a water source for washing off the fuel.

Entering a warm room wearing fuel-soaked clothing can be dangerous. Chances of a fire starting because of static electricity are increased.

### **Fuel Spill Cleanup**

Airtanker base personnel should, per agency and/or airport requirements, ensure that all oil, fuel, and other materials are cleaned from ramp areas according to environmental requirements on a daily, or as needed basis. The use of biodegradable or environmentally acceptable cleaners or solvents is required. The entity that causes the fuel spill is responsible for the cleanup.

## **Chapter 11 – Security**

### **Security Planning**

Airtanker bases shall develop a plan based on information and direction regarding security measures and planning addressed within individual contracts, Forest Service Handbook 5709.16, Chapter 38 Aviation Security, or DOI 352 DM 5, Aircraft, and Aviation Facility Security or as otherwise appropriate based on your agency.

Airtanker bases should also reference the Department of Homeland Security requirements, TSA Security Guidelines for General Aviation Airports Information Publication A-001 and appropriate individual state or local guidelines.

The security plan should reflect the needs of the geographic area and the type of operation in which you are engaged. Review with local Law Enforcement as needed.

### **Aircraft Security**

It is generally the vendor's responsibility to provide for security of their aircraft. Follow contract requirements along with agency policy for securing aircraft while at an airtanker base.

The *NWCG Standards for Airtanker Base Operations (SABO)* is developed and maintained by the Airtanker Base Operations Unit (ABOU), under the direction of the National Interagency Aviation Committee (NIAC), an entity of the NWCG.

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While they may still contain current or useful information, previous editions are obsolete. The user of this information is responsible for confirming that they have the most up-to-date version. NWCG is the sole source for the publication.

This publication is available electronically at <https://www.nwcg.gov/publications/pms508>.

Comments, questions, and recommendations shall be submitted to the appropriate agency program manager assigned to the ABOU. The ABOU will annually review and update the *SABO* as needed. View the complete roster at <https://www.nwcg.gov/committee/airtanker-base-operations-unit>.

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