

2015 NIFC RAMP SERVICES OPERATION PLAN

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Date: 02/04/2015

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CHAPTER 1 INTRODUCTION

The National Interagency Fire Center (NIFC) Ramp Services Operation Plan is supplemental to the National Interagency Airtanker Base Operations Guide (NFES #2271). This plan provides local operational procedures specific to the NIFC Ramp. Although the intention of this plan is not to duplicate directions published in other documents, it is at times necessary to do so for clarity.

1.1 Objectives

The objectives of this supplement are to:

- Define the mission of NIFC Ramp Services.
- Define and standardize operating procedures at NIFC Ramp Services.
- Provide checklists, orientation outlines, and special instructions for government employees and contractor employees.

1.2 Mission

The mission of the NIFC Ramp Services is to provide a safe, effective, and efficient environment for the coordination and support of aviation resources supporting wildland fire management activities.

1.3 Authority and Policy

The NIFC Ramp operates under the authority of the BLM National Aviation Office.

Operational procedures are based on the guidance of the Interagency Airtanker Base Operations Guide.

1.4 Revisions and Approvals

This guide is revised annually by the Ramp Services Unit Supervisor in February of each year. The plan is reviewed and approved annually by the Deputy Division Chief, Aviation.

1.5 General Information

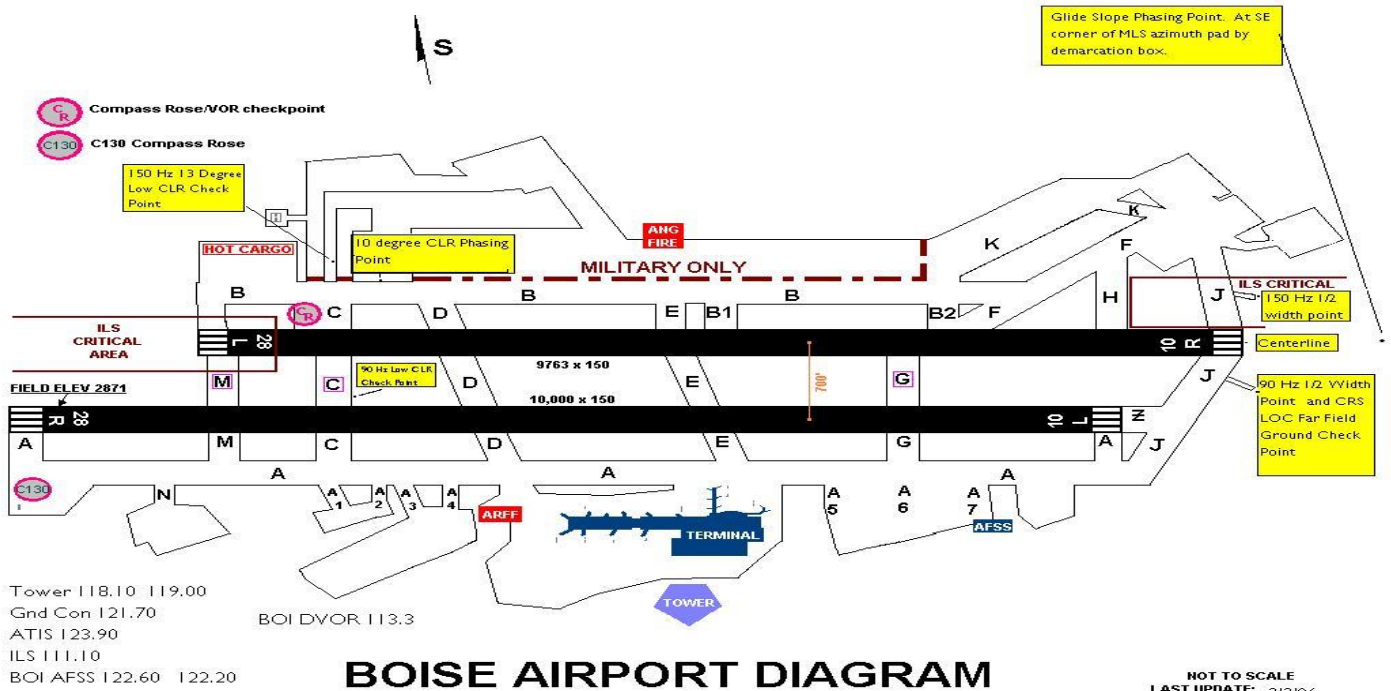
The Ramp Services Building is located at the National Interagency Fire Center.

- Mailing address - 3833 South Development Avenue, Boise ID 83705
- Physical location - Building 210, 2455 Robinson Road
- Telephone number - (208) 387-5529
- Fax number - (208) 387-5785

The NIFC Ramp Services Aircraft Operations Area (AOA) is located at the Boise Air Terminal on the northeast corner of the field.

- Use Taxiway A-3 or Taxiway A-4 off of Taxiway A to enter the ramp
- The NIFC Ramp radio frequency is 135.675
- Normal hours of operation are 08:00 to 16:30, Monday - Friday, October - June
- Summer hours of operation are 08:00 to 18:30, Seven day a week, July - September
- Advise Ramp Services or the National Interagency Coordination Center (NICC) at (208) 387-5400 if arriving or departing prior to or after normal business hours by aircraft on NIFC AOA for Aircraft Attendant availability.

BOISE AIRPORT MAP



NIFC RAMP



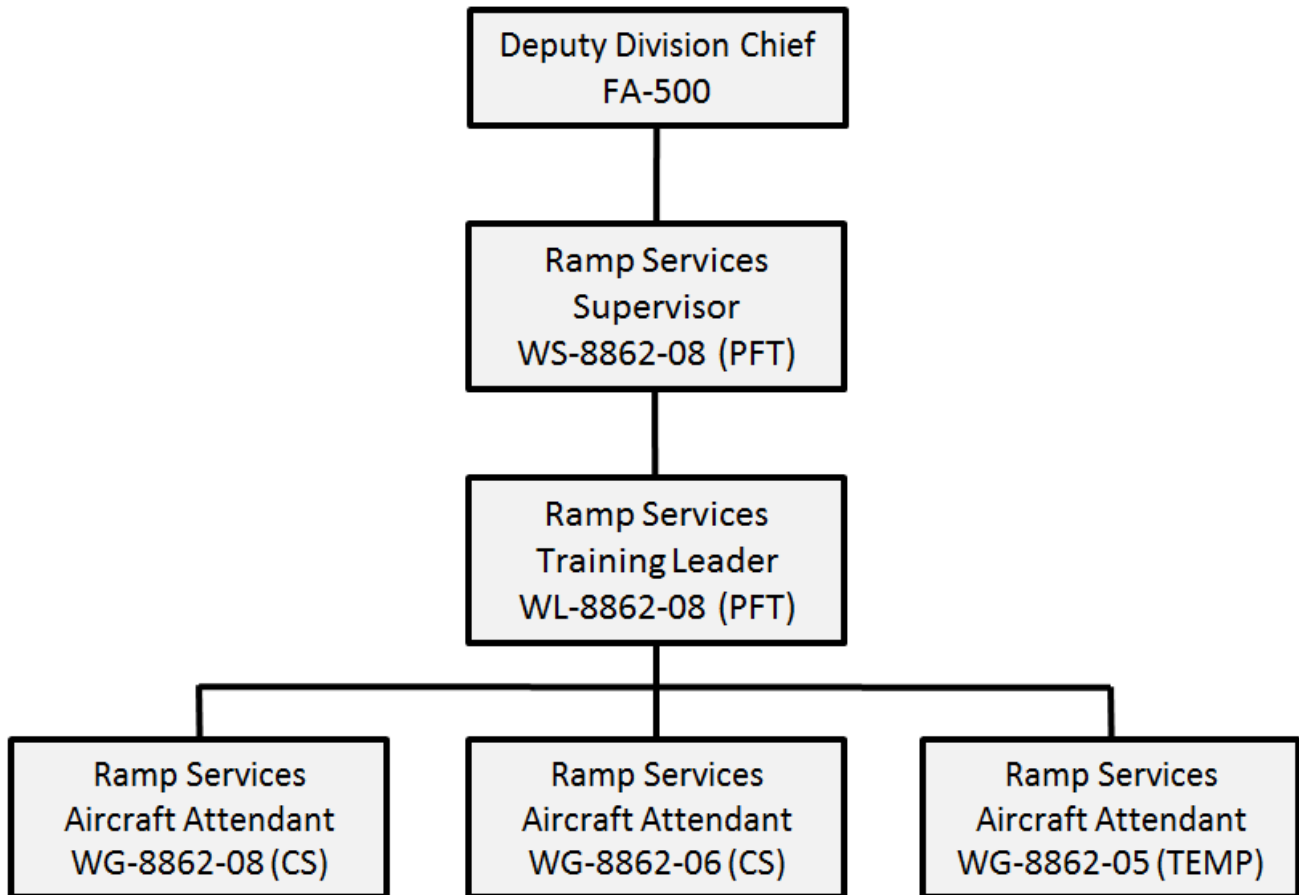
CHAPTER 2 NIFC RAMP PERSONNEL ORGANIZATION AND RESPONSIBILITIES

2.1 Agency Responsibilities

The BLM National Aviation Office (FA-500) manages the NIFC Ramp Services Branch (FA-510).

2.2 NIFC Ramp Services Personnel

The NIFC Ramp Services Supervisor has oversight of all administrative and general operations. The Ramp Services Training Leader works under the Ramp Services Supervisor and has responsibility for the daily operations. Aircraft Attendants work under the Ramp Services Training Leader.



2.3 Dress Code

Ramp Services Aircraft Attendants are to wear their BLM purchased uniforms while on duty. Leather upper footwear will be worn at all times. The exceptions to these requirements are if you are called back after leaving work for the day or if called in while on week-end standby. Personnel detailed in will be given safety vests to wear and will be required to wear leather upper footwear.

2.4 Duties and Responsibilities

Ramp Services operations require that Aircraft Attendants are qualified as:

- Fixed Wing Base Manager (FWBM)
- Ramp Manager (RAMP)
- Fixed Wing Parking Tender (PARK)
- Aviation Fueling Specialist (AFUL)
- Loadmaster (LOAD)

These positions are described in the Interagency Airtanker Base Operations Guide (NFES #2271), Chapter II, B.

The following duties and responsibilities are also required for the other daily activities we are required to perform at Ramp Services as Aircraft Attendants.

2.4.1 Flight Operations Desk

- Receive, coordinate and relay administrative and fire related information associated with personnel and aircraft
- Communicate with National Interagency Coordination Center (NICC) and other dispatch offices
- Monitor Ramp access and security
- Ensure incoming and outgoing documents are accurate
- Verify pilot and aircraft are authorized
- Post and continually update scheduled aircraft departures and arrivals times
- Provide parking and movement guidance to all aircraft within the Ramp area

2.4.2 Flight Crews and Passenger Amenities

- Provide flight planning facility
- Provide lounge and rest area
- Provide fax machine and telephone
- Provide assistance as needed

2.4.3 Fire Crew Staging

- Monitor, remove and dispose of all hazardous materials not authorized for transport by air
- Ensure compliance of the National Mobilization Guide
- Ensure accuracy of personnel and cargo manifests

2.4.4 Ramp Operations

- Marshall and direct all fixed wing Aircraft parking
- Tow and relocate aircraft
- Provide aircraft ground support services

2.4.5 Mechanically Maintain and Operate all Aviation Ground Support Equipment

- AC and DC electrical power units
- Tow tractors.
- Passenger boarding stairs vehicle

- Baggage and cargo conveyor belt vehicle
- Pneumatic air starts
- Lavatory service carts
- Potable water cart units
- Portable light carts
- Forklifts
- Aircraft maintenance stands
- Hazardous material waste cart
- Ramp sweeper vehicle

2.4.6 Aircraft Fueling

- Observe fueling vendors for proper operation and procedures.

2.4.7 Cargo Loading

- Verify cargo manifest and weights for accuracy
- Determine cargo destinations and loading sequence
- Secure all cargo

2.4.8 Cargo Un-loading

- Determine and identify cargo to be off-loaded
- Position un-loaded cargo to proper location as required
- Re-secure any cargo destined for other drop off locations

2.4.9 Passenger Loading/ Off- Loading

- Assist in loading/ unloading personnel and baggage
- Verify passengers with particular aircraft and destination
- Verify accuracy of passengers listed on manifest and cargo weight distribution for assigned aircraft
- Ensure all baggage is loaded/ unloaded according to destination sequence
- Ensure flight line safety for all passengers

2.4.10 Loadmaster Duties on Contract Jet

- Verify all passenger and cargo weights per the passenger manifest, and other needed flight information
- Maintain communications with NICC and flight crew for all flight information on scheduling and dispatches
- Assists in fire crew and equipment loading or offloading in accordance to the National Interagency Mobilization Guide
- Ensure hazardous material regulations are enforced in accordance to the Interagency Aviation Transport of Hazardous Materials Handbook
- Oversee aircraft loading and unloading of cargo and informs flight crew of cargo and distribution for aircraft weight and balance computations
- Ensure aircraft flight line safety, fueling operations and regulations are adhered to
- Assist in resolving any issues or problems associated with fire crews and flight destinations and departure times
- Maintain accurate records of all flights within the loadmaster log book

2.4.11 Flight helmet Repair and Refurbishment

- Inspects and repairs to manufactures specifications
- Perform TPL conversions on SPH-4 flight helmets to meet Aviation Life Support Equipment standards
- Communicate with all government agencies, field users, warehouse caches and flight helmet

manufacture to resolve problems or concerns

2.4.12 Field Assignments as Qualified

- Fixed Wing Base Manager (FWBM)
- Aircraft Ramp Manager (RAMP)
- Parking Tender (PARK)
- Aviation fueling Specialist (AFUL)
- Loadmaster (LOAD)

2.5 Plan for Expanding Complexity

Addition personnel will be detailed in or AD's hired if the operational complexity exceeds span of control or safe operating practices.

2.6 Training

NIFC Ramp Services Supervisors will ensure that all Aircraft Attendants receive required Agency training. This training will include but not limited to:

Annual

- Diversity training
- EEO training
- Federal Information Systems Security Awareness
- Privacy and Records Management
- Firefighter Refresher

Biannual

- First Aide
- CPR
- AED

Triennial

- Defensive Driving
- Basic Aviation Safety (B-3)
- Forklift Operators Training
- Other IAT as required

The above training is in addition to the required training described in the Interagency Airtanker Base Operations Guide (NFES #2271), Chapter II, C.

2.6.1 Local Training

All Aircraft Attendants will receive annual familiarization on the NIFC Ramp Operations Plan.

All personnel will be briefed on the NIFC Ramp Services Emergency Procedures, NIFC Occupant Evacuation Plan and Continuity of Operation Plan. Ramp Services Personnel and aircraft crews will be familiar with the locations of first aid kits, AED, and fire extinguishers in the buildings and on the aircraft ramp.

All personnel working or using the NIFC Ramp will be trained in the NIFC Hazard Communication Plan. This training includes hazardous materials used for ramp operations, Safety Data Sheet (SDS) location, Hazardous Material clean up trailer location and equipment, and Job Hazard analysis.

All Ramp Services Personnel will participate in the Hearing Conservation Plan and receive annual training on the proper use of hearing protection devices and Personnel Protection Equipment (PPE).

All personnel will receive training on the NIFC Ramp Security.

All Ramp Services personnel working on the NIFC AOA will receive annual training on the operations of the hand held and wheeled fire extinguishers.

2.6.2 Position Training

All WG-8 Aircraft Attendants will be qualified and red-carded in the positions of Fixed Wing Base Manager (FWBM), Ramp Manager (RAMP), Fixed Wing Parking Tender (PARK), Aviation Fueling Specialist (AFUL), and Loadmasters (LOAD) as described in the Interagency Airtanker Base Operations Guide (NFES #2271), Chapter II C. Qualifications and Training.

All WG-6 Aircraft Attendants will be qualified and red-carded in the positions as Ramp Manger (RAMP) and Fixed Wing Parking Tender (FWPT).

2.6.3 Training Accomplishment

Training for WG-8 Aircraft Attendant will occur when all WG-8's have returned for the year.

Training for WG-6 Aircraft Attendants will occur when all WG-6's have returned for the year.

Training for WG-5 Aircraft Attendant will occur when all WG-5's have returned for the year.

Training will consist of class room and On the Job Training (OJT). WG-5's will receive OJT instruction from WG-8's assigned by the Ramp Services Training Leader.

2.6.4 Evaluation

All personnel working or detailed to the NIFC Ramp Services will receive an evaluation of their position performance. These evaluations will be included in their training file kept in the Aircraft Attendant Leaders office and will be forwarded to the unit training officer for inclusion in the employee's incident qualification file. All Aircraft Attendants assigned to NIFC Ramp Services will receive annual training and evaluation on their position description requirements.

2.6.5 Responsibility

The Ramp Services Training Leader will be responsible for assuring that all trainee positions receive required training and that adequate OJT was conducted before being released to perform duties without direct supervision.

2.6.6 Recordkeeping

Aircraft Attendants training records are up-dated as training is completed by the Ramp Services Training Leader. The training records are maintained by the Ramp Services Training Leader in a locked filing cabinet and available to the Aircraft Attendants.

CHAPTER 3 ADMINISTRATIVE PROCEDURES

The administrative procedures, forms and reports used at the NIFC Ramp Services Operation differ greatly from the forms and reports used in the Interagency Airtanker Base Operations Guide, for this reason the Boise Airtanker Base Operations Guide Supplement is included at the end of the NIFC Ramp Services Operations Plan.

3.1 NIFC Ramp Services Forms

NIFC Ramp Services uses a variety of forms and reports to track aircraft movements, cargo and passenger arrivals and departures, fire extinguisher inspections and personnel actions.

The following pages show the forms and explain how they are to be filled out.

3.1.1 Flight Action Log

RAMP SERVICES FLIGHT ACTION LOG									
									YEAR _____
MM/DD	Fire/order Number	N-Number / Card Acft Type / Check	Owner Flt. User	Pax IN	Pax Out	Cargo LBS	ATA	ATD	Remarks
1	2	3	4	5	6	7	8	9	10

Column 1	Enter date using 2 digits for month and day i.e. 09/09 or 10/10
Column 2	Enter fire number or order number i.e. F25M or ID-BOI-000000
Column 3	Enter aircraft N number on top half of column and aircraft type on bottom half of the column. Enter a check mark on far right side of column if pilot qualification card issued by Office of Aviation Services (OAS)/ Forest Service (FS) is current i.e. N49SJ/T-Otter
Column 4	Enter aircraft owner if known on top half of column and flight user on bottom half of the column i.e. Greenwood/USFS or OAS/BLM
Column 5	Enter total number of passengers (PAX) arriving excluding flight crew
Column 6	Enter total number of PAX departing excluding flight crew
Column 7	Enter total cargo weight in pounds arriving or departing, if cargo arriving and departing on same aircraft put a slash mark between the cargo totals weight i.e. 105/55
Column 8	Enter actual time of arrival. Arrival time is the time that the aircraft is chocked. Times are entered using the 24 hour clock system i.e. 01:00 or 13:30
Column 9	Enter actual time of departure. Departure is defined as the time the aircraft starts its take-off roll. If aircraft take off roll cannot be seen enter the time that you see the aircraft airborne. Use 24 hour clock system i.e. 08:01/20:01
Column 10	Enter brief flight (FLT) schedule i.e. pick-up (P/U) or drop off (D/O) destination BOI D/O 2 PAX, P/U 1PAX -> OGD D/O 1pax remain overnight (RON)

Be sure that the year is entered on the top right hand side of the page i.e. 2012.

Enter the information from the written log to the Staff Network Drive, Ramp access, and Ramp log.

3.1.9 Monthly Fire Extinguisher Report

Monthly Fire Extinguisher Report

Date 03/01/2012

UNIT NUMBER	TEMPERATURE	PRESSURE AND SIZE	CHECKED BY	
1	48° F	1900 160 BIC	WJH	
2	↑		↓	
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				J.G.
16				J.E.
17				WJH
STAIR TRUCK				
JET-17		195 120 BIC, 8 BIC		
JET-17				
JET-18				
JET-18				
WORK BAY				
HALL		195 120 A.BIC		
HALL				
MAINT. SHED	48° F		↓	
SEA-PAC SHED				

3.1.10 Passenger and Cargo Manifest

U.S. GPO: 1986-O-165-426/5853

STANDARD FORM 245 (6-77) Prescribed by USDA FSM 5715 USDT MFR400.51B		PASSENGER AND CARGO MANIFEST		NO. OF PASSENGERS ON THIS PAGE _____		PAGE _____ OF _____	
ORDERING UNIT		PROJECT NAME		PROJECT NO.			
NAME OF CARRIER		MODE OF TRANSPORTATION & I.D. NO.		PILOT OR DRIVER			
CHIEF OF PARTY		REPORT TO:		IF DELAYED, CONTACT:			
DEPARTURE PLACE		ETD	ETA	INTERMEDIATE STOPS PLACE		ETD	ETA
PASSENGER AND/OR CARGO NAME		M	F	PASSENGER WEIGHT	CARGO WEIGHT	DUTY ASGMT. IF APPLICABLE	
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
SIGNATURE OF AUTHORIZED REPRESENTATIVE						DATE	

CHIEF OF PARTY COPY 245-101

DOD – BLM/USFS – SPECIAL CHARTERS			
FLIGHT #	A/C #	TOTAL PAX	
POINT OF DEPARTURE		POINT OF DESTINATION	
<p style="font-size: x-small;">(IN ACCORDANCE WITH HMR 175/AMC/USFS/BLM)</p> <p>I CERTIFY THAT NO UNAUTHORIZED WEAPONS/AMMUNITION/EXPLOSIVE DEVICES, OR OTHER PROHIBITED HAZMAT ARE IN THE POSSESSION OF THOSE PERSONNEL FROM WHOM I AM THE DESIGNATED MANIFESTING REPRESENTATIVE OR GROUP LEADER, AND THAT THEIR AUTHORIZED WEAPONS HAVE BEEN CLEARED.</p>			
<p>I CERTIFY THAT CALIBRATED SCALES HAVE BEEN USED FOR WEIGHING BAGGAGE/CARGO.</p>			
DATE	PRINTED NAME (Last, First, MI)	TITLE	SIGNATURE

FO-1 REV 6-27-11

This form is to be filled out and signed by the Crew Rep or Squad Boss.

3.2 Daily Administrative and Operational Procedures

Aircraft Attendants are expected to complete the following “Opening Building and Vehicle Bay/Ramp Shed” procedures each morning by 08:15 hours and in uniform.

Opening Building

- Ensure all outside entrance doors are unlocked and normal activity within the building has accessibility.
- Open service-counter glass doors.
- Check fax machine in Flight Operations office and Pilot Planning Room for any orders or messages.

- Check voice mail light on telephone for messages.
- Make a Ramp Services Activity Log entry of the time, date, and that we are open and review the entries from the previous day.
- Record any overnight aircraft arrivals on status board.
- Inform Supervisor of any activity scheduled for the shift.
- Assure fax and copy machines are fully supplied with paper and camera monitor is turned on.

Vehicle Bay/Ramp Shed

- Survey the vehicle bay and ramp shed for hazards or conditions that may affect safety.
- Take corrective action, or inform the supervisor that assistance is needed from outside the section.

Safety and Operational Briefing

These briefings are held at 08:15 daily in the Operations office. Aircraft Attendant Work Leader/Supervisor will obtain information between the hours of 08:00 and 08:15 for the Safety and Operational briefing. The briefings will consist of:

- The Incident Management Situation Report
- Known day's aircraft movements
- RON's
- Day off aircraft
- Local TFRs
- Weather
- Daily Aircraft Attendant assignments i.e. Operation's office Desk Attendant
- Any other information deemed necessary for the safe and efficient operation of the NIFC Ramp

After the Safety and Operational Briefing the following activities will be accomplished by the Aircraft Attendants:

Ramp Work

- Pick up lights and traffic cones from aircraft
- Check all aircraft for being chocked and/or tied down
- Check Ramp AOA and apron for hazards and FOD

Vehicles

- Complete Daily Inspections on vehicles and equipment
- Inform Supervisor of any discrepancies found on vehicles or equipment for approval of repair

3.3 Flight Operation's Desk Administrative Procedures

All Aircraft Attendants will be responsible for performing the duties of Flight Operations Desk Attendant. Duties and responsibilities are:

Office Housekeeping

- Desk Attendants are responsible for insuring that the Flight Operations office, Pilots Lounge, Ramp Break Room, Rest rooms, and Front entrance lobby are clean and clear of refuse items at the end of day. On week-ends all trash will be taken out and clean trash bags placed in trash cans.

Phone Response

- Answer the phone with the proper identification and courtesy. Identify the section, "Ramp Services", followed by your name. Attendants are to take messages, fire order information or make the required referral.

Aircraft Status Board

- Keep the Aircraft status board updated: aircraft in-bound time, departure time, stop off points, and any other pertinent information necessary for the operation of Ramp Services. Flight Request's received are to be reviewed, logged and filed in the flight schedule holder.

Logistics Inter-Communication

- Ramp Services communicates with NICC and other dispatchers both verbally and via FAX. Attendants are to take all verbal orders, requiring order number, aircraft type, "N" number, date, time arrival or departure, and type of load, (1), cargo/type and approximate pounds, or (2), passengers with names and total number, aircraft destination and all stops. All information is to be reaffirmed by reading back the information to the Logistic Dispatcher.

Interpersonal Communication

- Attendants are to communicate in a courteous manner to all persons entering the Ramp Services Building. Relay messages and be of assistance to individuals seeking help or information. Check all pilots' cards for expiration date. If a pilots OAS card has expired inform the pilot that the card has expired. Let the pilot know that you are calling NICC for further action. This action by NICC maybe cancelling flight, replacing pilot, or getting a different vendor. This holds true for the Aircraft OAS card also.

Vehicle Electrical Gate

- Attendants are to visually check the vehicle gate monitor and verify identification via the intercom prior to opening the ramp access vehicle gate. Only authorized vehicles and persons will have Ramp access. No Private Vehicles or Motel Vans are allowed on the Ramp. Attendants will communicate in a courteous and straight forward manner to the party in question. Only vehicles having a ramp pass have unquestioned access. Special situations are to be brought to the Supervisor's attention and entered into the Ramp Services Daily Activity Log.

3.4 Ramp Services Documentation Records

Desk Attendants are responsible for accurately and thoroughly filling out all appropriate information associated with the following:

Ramp Services Daily Activity Log

- All ramp activities are to be documented by date, names, action and time.

Ramp Services Flight Action Log

- All information on the log sheet is to be completed. Attendants are to ensure that the pilots OAS-FS card is checked for currency (reference Chapter III - Interpersonal Communication).

Vehicle Pass Checkout

- Passes are to be issued out to only those vehicles that have a direct need to be on the ramp. The vehicle log information requires vehicle type, license number and the name of the person checking the pass out. The vehicle log is to be checked periodically to insure no passes are outstanding.

Time and Attendance

- Aircraft Attendants are responsible for accurately filling out and sending in their time using Quick-time. This includes regular time, over-time, and leave. Aircraft Attendants are to fill out Pay Period sheets and e-mail them to the Ramp Supervisor and Ramp Training Leader who will e-mail them to the NAO Staff Assistant. Aircraft Attendants will keep a record of start and stop times in a calendar provided by the Ramp Supervisor and return the calendar to the Ramp Supervisor when released from pay status. Roll

call will be taken at 08:00 hours.

Flight Requests

- All Flight Requests are to be recorded in the Ramp Services Daily Activity Log and filed when completed (reference Chapter III Aircraft Statue Board).

Credit Card Expenditures

- Document and ensure proper charges are coded correctly.

Warehouse Issue

- Verify proper cargo for destination and possible Hazardous Materials.

CHAPTER 4 FACILITIES

4.1 General

The NIFC Ramp Services facility is located on the northeast corner of the Boise Air Terminal (Gowen Field). Aircraft enter and depart the NIFC Ramp AOA and the Boise Air Tanker Base using taxiway's "A-3" and "A-4" from Taxiway "A". This AOA is owned and maintained by the U.S. Government, Bureau of Land Management.

The NIFC Ramp AOA and Boise Air Tanker Base can accommodate up to 12 heavy air tankers i.e. P2Vs, C-130H and J models and DC-10's.

We can accommodate commercial aircraft including the Boeing series aircraft, B-727-100, 200, B-737-200 to 900, B-757's, B-767's, Airbus models up to and including the A-340. All types and series of smaller aircraft to include Lead planes, ASM planes, Initial Attack platform aircraft, Smoke Jumper aircraft, and support aircraft.

Helicopter Operations **must** have pre-approval from NIFC Ramp Services to operate to and from the NIFC AOA.

4.2 Aircrew Facilities

The NIFC Ramp Services building has a flight planning office with fax, copy machines and telephone. A pilot lounge with couch's, chairs, DVD, and TV are available, additional pilot accommodations can be found at the Boise Air Tanker Base.

4.3 Aircraft Facilities

NIFC Ramp Services Aircraft Attendants will strive to marshal all arriving and departing aircraft.

All arriving aircraft at the NIFC AOA will have the nose wheels chocked, and a safety walk around preformed, if the aircraft is remaining overnight then the main wheels will be chocked. Light aircraft will be tied down at the end of the business day. Aircraft tie downs with chains are available on the aircraft hard stands and barrels with rope tie downs on the black top.

NIFC Ramp Services Aircraft Attendants will remove all wheel chocks, tie downs and preform safety walk around prior to authorizing engine start and marshalling departing aircraft.

Flashing lights and cones will be placed as needed at the wing tips, nose and tail of the aircraft at night. NIFC Aircraft Attendants will remove lights and cones as required at the beginning of each day as well as the tie downs and main wheel chocks.

The NIFC AOA stationary lights are attached to the Jumper Loft, Ramp Services Building, Warehouse and U.S. Forest Service Hanger. Additional lighting is available by the warehouse, to turn these lights on contact NIFC Ramp Services.

NIFC Ramp Services has light and heavy aircraft tugs and tow bars for moving and towing aircraft. If you need an aircraft towed advise NIFC Ramp Services Supervisor.

Aircraft will be marshalled to parking by NIFC Ramp Services Aircraft Attendants, usually the heavy air tankers will be parked on the blast fence or on the hard stand by the warehouse. Lighter aircraft usually are parked on the hard stand in front of the Ramp Services building. Jumper aircraft will be parked in front of the jump loft.

If no jumper aircraft are on the ramp and they are hot loading SEATs out of the Boise Air Tanker Base we will

hold the SEATs in front of the jumper loft until the tanker base is ready for them. If there are jumper aircraft we will hold the SEATs on the south end of the hard stand in front of the Ramp Services building.

The Boise Air Tanker Base Manager will alert Ramp Services if they need additional parking areas and if the aircraft will need to be jacked so it can be put it on a hard stand.

4.4 Communications

Telephones are located in the NIFC Ramp Services Building. To call off base dial 8 then the number, if dialing an on base extension dial last 4 digits.

If you have to make an emergency call dial 8-911 or 911. Emergency telephones are located on the west end of the Jumper Loft, on the warehouse and on the radio shop. The physical address for the Ramp Services building is: 2455 W. Robinson Road, Boise ID 83705.

Communications between the aircraft, NIFC Ramp Operations, and the Aircraft Attendant is by radio. The VHF frequency is 135.675. An outside public address system is also available as needed.

4.5 NIFC Ramp Services Safety Facilities

A first aid kit is located on the wall just inside the east door of the NIFC Ramp Services Building work bay and on the wall above the copier.

An AED is located on the wall above the copier.

Fire extinguishers are at the west and east ends of the hallway in the middle of the NIFC Ramp Services Building and in the work bay. These are 20-A: 120-B: C extinguishers.

There are 17 wheeled fire extinguishers located every 200 feet around the NIFC AOA. These extinguishers are 160-B: C or 320-B: C rated and 125 pound capacity.

Personal Protection Equipment can be attained from the NIFC Ramp Services Building. This includes ear plugs, gloves, safety glasses etc.

There is a Hazardous Materials Spill Trailer located by the NIFC Ramp Services Building along with a cart for Speedy Dry and spill mats. If you have a hazardous material spill inform NIFC Ramp Services personal as soon as possible. The SDS Manual is located in the work bay.

There is a shower in the men restroom inside of the NIFC Ramp Services Building.

CHAPTER 5 SAFETY

5.1 Safety Briefing

Daily safety briefing will be held in the Operations office at 08:15 hours daily.

Any pertinent information about the prior day's activity will be discussed as well as any information about the current day's activity i.e. known day's flights, weather, RON's Day's Off, TFR's, other safety concerns and daily job assignments.

5.2 Aviation Incident/Accident Plan

A copy of the Interagency Aviation Mishap Response Guide and Check List (NFES # 2659), and a copy of the NIFC Occupant Emergency Evacuation Plan is located by the telephones in the Pilot Preflight office, Training office, Flight Operations office, Supervisors office and Pilots work area.

5.3 Emergency Response Equipment

Fire Extinguishers

# of Extinguishers	Rating	Location
10	320 B/C 125 pound capacity	Every 200 feet around the NIFC AOA
7	160 B/C 125 pound capacity	Every 200 feet around the NIFC AOA
2	20-A 120-B/C	Each end of the hall in the Ramp Services building
1	3-A 40-B/C	On the wall in the work bay
1	3-A 40-B/C	In the shed by the warehouse
1	2-A 10-B/C	In the Ramp Services Maintenance Shed
1	2-A 10-B/C	Behind the seat in the Stair Truck
2	120 B/C	On the sides of the Aircraft Refueler Trucks
2	80 B/C	On the sides of the Aircraft Refueler Trucks

All fire extinguishers are inspected annually by Taylor Brothers. Ramp Services Aircraft Attendants inspect all fire extinguishers for serviceability on a daily bases and record their findings monthly.

First Aid Kits

There are two first aid kits in the Ramp Services Building. One is located in the break room above the copier and the other is located in the work bay beside the east man door.

National Fire Protection Association

The Ramp Services Training Leader has a copy of NFPA 407 and 410 in the Training Office. The NFPA 407 and 410 addresses most fueling safety issues to include parking-of-not-in-use fuel trucks, parking fuel trucks at aircraft, fire extinguishers for the ramp and fuel trucks, sizes of fire extinguishers etc.

5.4 Ramp Safety Plan

It is the policy of the NIFC Ramp Services unit that every employee is entitled to work under the safest possible conditions. In recognition of this, every reasonable effort will be made in the interest of accident prevention, fire protection, and health preservation. In our business, an awareness and recognition of safety must be an integral part of everything we do. In this way each of us will contribute to make our work place more safe, effective, and efficient.

It is the responsibility of every employee to ensure that they are performing their duties in accordance with Health and Safety Codes (OHSA) guidelines, DOI, BLM and other guidelines.

Employees who are directly involved in the movement and loading of all types of aircraft are acutely aware of time and may develop a tendency toward undue haste while loading the aircraft and marshalling off the AOA.

Rapid, efficient work can be done in a safe manner, provided each member of the team does their job and uses proper procedures and equipment. Short cuts are never to be used when safety may be compromised. A preplanned method of working at the NIFC Ramp will prevent confusion, mishandling, and unnecessary rushing, all of which could lead to accidents and injuries.

5.4.1 Responsibilities

All managers and supervisors directly in charge of the activity of others, are responsible for the safety and welfare of all personnel under their direct supervision, and are responsible for reporting of hazards, accidents, and incidents in a timely manner to protect the rights of the employees and the DOI.

Supervisors shall:

- Enforce all safety regulations
- Ensure all employees are properly trained in all required operational and safety related procedures
- Provide all required safety instructions to employees prior to the commencement of duties
- Review the operation and take prompt action to eliminate unsafe work practices
- Inspect the workplace to ensure hazardous conditions are promptly recognized and eliminated
- Ensure all equipment operational checks are completed, and equipment maintenance is performed regularly
- Ensure equipment is operated in the prescribed manner and only by trained, qualified, and licensed operators
- Enforce the highest standards of general housekeeping and cleanliness to minimize risks to health and safety
- Take appropriate measures to reduce the risks of fire and ensure emergency procedures and evacuation plans are developed
- Promote an awareness of the need for safety among all employees
- Ensure the initial reporting of all accidents/incidents is completed in a timely and appropriate manner

Employees shall:

- Follow all safe working practices
- Use tools that are in good repair
- Wear clothing and footwear suitable for the job
- Use all safeguards and safety devices furnished for their protection
- Wear approved protective devices when required, including but not limited to; eye protection whenever there is the hazard of foreign bodies entering the eye, approved hearing protection when exposed to hazardous levels of noise, wear protective clothing when exposed to chemicals or other injurious exposures
- Refrain from wearing any loose dangling neckwear, bracelets, rings, or the like around mechanical equipment
- Confine hair whenever working around hazardous equipment
- Ensure proper housekeeping procedures are maintained to prevent tripping, falling, or slipping accidents
- Refrain from any activity that could endanger the safety of any worker. These include horseplay, scuffling, unnecessary running or jumping, practical jokes and speeding in vehicles
- Ensure all elevated stands, ladders or scaffolds are secure and safe prior to using
- Operate only that equipment or machinery in which they have had adequate instruction including knowledge of all operating details
- Ensure that a clear field of vision is maintained and there is adequate space to maneuver whenever operating any equipment, to include the use of a ground guide when necessary
- Obey all traffic signs, signals, and regulations at all times and places when operating equipment or

driving vehicles

- Shut off all vehicle engines when parked and unattended
- At no time, under any circumstance use self-contained battery powered electronic devices (e.g. IPODS, cell phones) in any area of the aircraft or ground equipment movement

5.4.2 Ramp Safety Procedures

Ramp areas require constant vigilance to maintain a safe working environment. There are several basic rules which provide the foundation of safety on the ramp area:

- All employees assigned to work on or around ramp areas must be trained in safety procedures regarding the operation of the ramp area. New and inexperienced employees must be provided with proper training and supervision.
- Smoking is not permitted on the ramp at any time. Smoking is not allowed in the building and only in designated areas. All employees should be vigilant for anyone smoking or preparing to smoke in NON SMOKING areas, particularly near aircraft.
- Use only approved flashlights near fueling as ordinary flashlights could ignite vapors.
- Employees working on ramp areas must wear approved hearing protection and keep clear of running engines.
- It must be remembered that ramp operations, while often not involving direct contact with the public, are usually public-visible. Accordingly, employees should operate with the understanding that their actions are being viewed by people, and that their actions often form the opinion the public may have about the U.S. Government and its employees.
- Security is the responsibility of every employee. Personnel assigned to ramp areas must be vigilant to any potential security problem on the ramp.

5.4.3 Personnel Safety

All employees are to be aware of and practice safety techniques which apply to their particular job assignment. Attire must be appropriate with the job and consistent with the ramp safety plan.

The wearing of jewelry such as rings and ID bracelets should be curtailed during operations on the ramp. Such articles of apparel are prone to catch on hooks, nails, buckles, locks, or straps, and have been known to damage fingers severely, even to sever them completely.

Footwear must be appropriate for the job. Employees whose job function includes the loading of aircraft and the subsequent spill of fuel should wear shoes that provide non-skid protection. Boot heels with steel plates or soles with metal screws must not be worn by ramp personnel since a spark may result if the steel is scuffed on the ramp. There is also a danger of slipping and falling.

Employees working on ramp areas in close proximity to the operation of aircraft engines must wear approved hearing protection devices.

If jet engine aircraft arrive on the ramp, during passenger transport operations, all personnel must be aware of special safety considerations. Employees must stay clear of intakes when jet engines are running. When engines are running, employees must stay a safe distance away from the jet blast.

In the event of any injury, however small, the employee must seek first aid. All injuries should be reported to the supervisor immediately.

5.4.4 Preventing Ramp Hazards

Employees must be vigilant during ramp operations in order to keep it hazard-free. Numerous functions in aviation operations are potentially hazardous to personnel working around aircraft, and many are presented by

the aircraft itself. General hazards are present around all aircraft types:

- Running engines and turning props
- Noise from engines that are running, especially turbines, and noise from other aircraft i.e., military operations
- Blowing debris from props and jet blasts
- Protruding control surfaces, antennas, pitot tubes, static wicks, open access hatches and other projections,
- Exhaust ports from Auxiliary Power Units (APU) have high temperatures and velocity. Inlets have sufficient suction to draw in loose objects,
- Spilled fluids: oil, fuel, hydraulic fluid, water methanol and retardant
- Tripping over auxiliary power cables, bonding wires, fuel hoses, water lines, retardant lines, wash down hoses, other ramp obstacles
- Flap droop and other devices often extend several feet below the main surface of the wing. The areas of these devices should be avoided
- Engine stack fires or fires from brakes
- Injuries from placing and removing wheel chocks
- Prior to aircraft maintenance engine runs on the NIFC ramp notify NIFC Ramp Operations
- Monitor taxi speed of aircraft, slow down if necessary
- Fixed hazards- Blast fence and loading pits, watch wing tip and tail clearance
- Fuel leaking from aircraft or fuel truck

5.4.5 Propeller Hazards

Strict discipline is absolutely required of employees working around propeller driven aircraft. All employees must be vigilant to avoid danger during arrival, start-up and departure phases of ground operations. Employees should adopt work procedures that include the following:

- Make it a habit to **NEVER** walk through or into the propeller (arc) danger area even when the propellers are stopped. The procedure should be to walk around the wing tip
- Never attempt to stop or move a propeller by hand. A hot engine may rotate even with the ignition systems off.
- Have a marshaller in a position in front of the aircraft during arrival and departure, when the engines are to be started or until they come to a full stop

5.4.6 Turbine and Jet Engine Hazards

Particular attention should be given to loose articles in shirt pockets or loose items lying on the ramp. Items such as hats, gloves, paper, rags and tools should be secured in such a manner so that they cannot be ingested into the propeller or engine intake. All engine intakes must not be approached unless the engine is shut down.

Turbine-powered aircraft exhausts are hazardous because of their high velocity, excessive temperatures, and toxic fumes.

The noise emitted by a turbine engine can be such as to represent a potential source of permanent hearing impairment. Accordingly, employees working in the vicinity of turbine/jet engines must wear approved hearing protection.

5.4.7 Aircraft Safety Procedures

Aircraft will not be taxied onto or off of the ramp unless properly trained personnel are in place to direct the aircraft.

Engines will not be started unless a marshaller is in place to signal the pilot in command that it is clear on the ramp to do so.

At all times, personnel and loose equipment will be kept well clear of intakes and prop arc areas.

Servicing vehicles parked near aircraft will have the emergency parking brakes set.

Personnel assigned to signal aircraft on or off of the ramp are responsible to assure the area is clear and safe for the movement of the aircraft.

Any incident of damage to an aircraft, however minor, by ground equipment or personnel, must be reported immediately to the PIC, COR, appropriate Aircraft Maintenance Inspector, and Aviation Safety Officer.

In the event of aircraft damage, the PIC will have the primary responsibility to determine, in concert with the Aviation Maintenance Inspector, the extent of the damage and the effect that damage will have on the operation.

Fuel, retardant and oil spills must be cleaned up immediately to prevent aircraft tires from entering the spill and the possibility of the aircraft sliding on the slick surface and causing damage to the aircraft or injury to personnel on the ramp.

Ground equipment should be positioned at least five feet from the aircraft.

When positioning equipment near aircraft, such as fuel trucks, forklifts, cranes, and any vehicle where visibility for the driver is limited, a ground guide will be used.

Never back a vehicle in the direction of an aircraft. Park vehicles so they do not back toward the aircraft when the job is completed.

5.4.8 Ramp Equipment Safety Guidelines/Operations

The safe operation of ground equipment is essential to the safety of the NIFC Ramp AOA operation. Under no circumstances will any type of equipment be operated when there is doubt regarding its safe operational condition, the working conditions, or the mission to be accomplished.

- Equipment and vehicles are to be operated in a safe manner and used for official business
- When operating equipment, employees are to be aware of other employees, equipment, and aircraft in the vicinity
- Employees and contractors are to operate only equipment with which they are familiar
- Ground equipment is to be parked in its proper place, with brakes engaged, when not in use
- Ground equipment will be chocked, if no brake on unit, and brakes set whenever in use near aircraft
- People working on the ramp have the right-of-way over ground equipment on the ramp
- Fueling of motorized equipment is to be accomplished only from authorized sources and only when the engine is shut off
- Ground equipment is to be operated only when it is in good repair
- Horseplay of any kind is not permitted when operating equipment or working on the ramp
- Where vision is restricted and in critical areas, operators should move only on signals from trained, qualified ground guides
- No vehicle or equipment may proceed onto taxi ways or runways without permission from Ground Control/Tower. Vehicles without radios must be escorted by radio-equipped escort vehicles
- Maximum speed while operating vehicles on the ramp will be 10 MPH. When approaching aircraft, speed must be reduced to 5 MPH MAX

- Never back any equipment or vehicles in the direction of aircraft

5.4.9 Foreign Object Damage (FOD) Prevention

Small items of debris naturally collect on an airport ramp. Such items as nuts, bolts, safety wire, leaves, tumbleweeds, and other debris is deposited daily on the surface of the ramp as a natural result of operations and weather. It is important to remember that such items represent a safety hazard to both aircraft and persons using the ramp. It is the responsibility of all employees who work on the ramp to be constantly aware of any foreign objects on the ramp which may cause damage to engines and props. It is a basic requirement that the ramp be kept tidy at all times. In addition, the following precautions must be followed:

- Avoid carrying loose objects on ramp vehicles and servicing equipment. If any object falls off a vehicle and is overlooked, it becomes a potential hazard
- Do not operate ramp equipment on other than paved areas, if it can be avoided. If it is necessary to operate a unit in an unpaved area, check tires for stones, which may be carried back onto the ramp area
- Prior to aircraft operations, personnel should look over ramp to ascertain the presence of any foreign objects that may be a hazard
- Garbage from aircraft and vehicles should be placed in the dumpster located on the ramp
- In addition to the normal departure checks and before the engines are started, visually check the areas around the landing gears and engines to make sure they are clear
- Pick up any debris immediately to prevent damage to engines, props, and possibly injury to personnel from flying debris

5.4.10 Electrical Storm Hazard

When an electrical storm is in the vicinity of the airport, precautions must be taken to reduce hazards should lightning strike. The size, intensity, speed, and direction of the electrical storm should be noted. Sound travels about 1/5th of a mile per second. An approximation of the number of miles to the storm can be made by counting the seconds between the flash of lightning and the sound of the thunder and dividing this number by 5.

If the storm passes within a 5 mile radius, fueling operations will be discontinued and equipment moved away from the aircraft.

A visual alert must be maintained.

When the storm has passed outside of the 5 mile radius, resume fueling of the aircraft.

5.5 Marshalling

A major factor to ensuring the safe and efficient movement of aircraft on the ramp is a coordinated interface between the flight crew and the ground crew. This coordination is only possible if the air crew and ground crew understand what the other expects. This is complicated by the fact that the flight crew must deal with ground crews at different AOA's. Therefore it is vital that all communication be standardized. We have done this with standard fixed-wing hand and arm signals. Some bases also have radio communications and whether the communication between the flight crew and the ground crew consists of visual signals or verbal dialogue, it is absolutely essential that each party is precise and clear when a request is made or direction is given. The approved Hand and Arm Signals are as described in the Interagency Airtanker Base Operations Guide (NFES #2271), Appendix A, which explains how to execute the proper movements.

A Marshaller is essentially the eyes and ears of the flight crew while the aircraft is taxiing into or off of an aircraft AOA. The pilot relies on the marshaller to guide him/her past hazards and on or off of the ramp in a safe, smooth, efficient manner.

All marshallers must know and use the approved visual signals when moving aircraft.

When marshalling visiting/transient aircraft, remember they may not understand your local procedures, so you may have to explain it to the flight crew while they are taxiing or after they shut down.

Approved hearing protection must be worn by ground personnel when near aircraft with engines or APU running or in areas with high noise level.

Ramp personnel must be aware of the dangers/hazard areas around engines that are running with props turning.

5.5.1 Ramp Safety Operating Requirements

Support equipment shall not approach the aircraft until the aircraft's engines have been shut down and props stopped turning

The aircraft marshaller must remain on the ramp until the aircraft departs and is clear of the ramp area.

NIFC Ramp Services Supervisor shall be sure that all personnel working on the ramp are properly trained and familiar with the equipment and procedures on the ramp.

NIFC Ramp Services Supervisor must insure that activities are conducted at all times with safety in mind.

5.5.2 Pre-Arrival Checks

Arrivals and departures require a certain amount of pre-planning. Before the aircraft arrive, certain steps must be taken to ensure safe and efficient handling:

- The ramp crew should be appraised as to what each will have for an assignment. Each must know what will be expected of them during the operation
- The marshaller must, prior to the arrival of the aircraft, determine on where ramp the aircraft is to be parked
- The coordination of airtankers and personnel transport aircraft must be done to ensure separation as well as safe/efficient movement
- The area over which the aircraft will taxi must be checked to make sure it is clear of personnel and equipment
- If the ramp is congested, an additional person must be assigned the mission as ground guide/wing walker, to aid in the safe movement of aircraft
- If equipment is to be used near the aircraft after it shuts down, keep the equipment clear until the aircraft is secured. Fuel trucks are not to be moved into position until the flight crew signals the driver to do so

5.5.3 Positioning the Aircraft

As the aircraft arrives, the marshaller must be in a position so as to remain in eye contact with the flight crew.

The marshaller must be easily identifiable so that the flight crew has no doubt as to who is directing their movement. The marshaller must raise hands and arms or contact the aircraft by radio to indicate to flight crew the direction to move aircraft for subsequent parking.

Wind direction and velocity must be considered in handling aircraft, especially with the increased utilization of turbine engine aircraft. If the wind speed is 15 mph or greater, the marshaller should try to park the aircraft into the wind. The marshaller must contact the flight crew to ascertain their wishes.

Marshallers must remember that it takes less power for an aircraft to taxi straight ahead than to make a turn. Planning should include marshalling paths that involve as few turns as possible.

When parking the aircraft, the marshaller must take into consideration positions designated for adjacent parking/parked aircraft and the space/access needed for service/fueling trucks.

Principal hazards to be guarded against in movement of aircraft on ramps are collision and prop wash. When taxi operation is involved, close watch of wing tip, tail, and nose positions must be maintained to warn against impending collision with other aircraft, fixed hazards, or service equipment.

When taxiing, prop wash hazards are to be guarded against, in addition to collision hazards. Prop wash can slam doors shut, cause unsecured equipment to roll or blow over, knock people down, cause turbo-prop propellers to rotate, and to blow large quantities of dirt or other debris about the ramp. All of this can result in injured people and damaged equipment.

Chocking is a procedure used to prevent movement and subsequent damage to aircraft when on the ground. To be effective, chocking procedures should be agreed upon and standard. The ground crew and the flight crew should discuss the procedures to define what should be done.

The right sized chock block should be used.

Variables that may dictate the need for chocks might be gusty or high winds, sloping ramps, shifting CG during loading, or the type of aircraft.

After propeller aircraft has come to a complete stop and the engines have been shut down, and before the brakes are released the wheel chocks should be placed in front of and behind the main gear tires and nose gear tires. Jet aircraft chocks will be placed on the nose gear tires after Marshaller stops aircraft and before engine shut down. During short durations of time on AOA, aircraft wheel chocks will be placed fore and aft of the nose gear tires.

5.5.4 Loading

A preplanned method of working on each specific aircraft will prevent confusion and possible overloading of an aircraft.

- If tail stand is available use it
- Use a ground guide when moving forklift into position at aircraft
- Never slide cargo across door seals
- Never force cargo into aircraft, if it will not fit inform NICC you need a different aircraft
- Look for signs of improperly loaded aircraft, i.e. nose strut extension, tail sitting low to the ground

For tanker base operations the loading crew and marshaller are the only personnel permitted on the ramp during aircraft loading operations. Contractor personnel will be allowed on ramp for inspection, maintenance, or talking to flight crew.

Aircraft fueling crews will be permitted on the ramp only prior to or after loading operations. Loading and fueling will not be done simultaneously.

5.5.5 Departure Procedures

A visual check of the exterior of the aircraft should be made by the marshaller, prior to commencing the start procedure, to ensure the aircraft is ready for departure. The following items should be checked:

- fuel spillage/dripping
- fuel caps and panels
- ramp area/prop blast area
- personnel and equipment

- service panels/doors
- loose equipment/attachments, or anything that might appear wrong with the aircraft
- Are the chock blocks removed?

It's safer to ask than to ignore.

When the loading of the aircraft is completed, the marshaller can signal the flight crew that the starting procedures can commence.

During engine starting at the ramp, alertness is required to ensure the safety of employees and equipment.

Personnel charged with the responsibility of marshalling must have full knowledge of the procedures and have communications with the flight crew.

The start sequence must be observed by a qualified person at all times. It is the duty of this person to ensure all personnel are clear of danger areas and that all equipment has been removed from the vicinity of the aircraft. The marshaller must maintain close surveillance of the aircraft and vicinity to ensure that no one enters the danger areas after the start sequence has commenced.

The marshaller must also observe the arrival of other aircraft and the deplaning of that flight crew. Prop blast could be a hazard to that crew or passengers.

As protection against fire, extinguishing equipment must be present during the aircraft start. The type of extinguisher must be appropriate with the type of fire anticipated. Managers must ensure that the extinguishers are maintained and in good working order, and that all personnel are familiar with their operation and use. Ramp crews should talk with flight crews about fires and fire extinguishers, when to use them and when not to.

Once the aircraft engines are started and the marshaller is given the heads up that the flight crew is ready to depart, the marshaller will signal the pilot to pull out, making sure that the aircraft is clear of all obstacles.

All personnel working on the ramp have the responsibility of doing visual safety checks on the aircraft as well as on the ramp operations and to either notify the Marshaller or the flight crew of any safety items observed.

5.6 Ear-Noise Hazards and Protection

It is the responsibility of the employer to provide an annual education and training program for all employees included in the Hearing Conservation Program. The Training program must include the following topics

- Hearing Protection
 - Its proper use, care and attenuation characteristics
- The Effects of Noise on Humans
 - Especially the hearing mechanism
- The Purpose of Audiometric Testing
 - And the actual test itself

On April 4, 1986, the Chief, Division of Management Services instituted a Hearing Conservation Program for Ramp Services. Reference Appendix 1 for a copy of the Memorandum as well as additional information regarding Hearing Conservation.

5.7 NIFC Ramp Services Job Hazard Analysis

Reference Appendix 2

5.8 Fueling Precautions

Reference Appendix 3

5.9 Fueling Aircraft

All fuelling will be in accordance with NFPA 407, NFPA 410 and DOI Aviation Fuel Handling Handbook. Aircraft will not be loaded or unloaded of cargo, passengers, or retardant while fueling. There is NO hot refueling of any type allowed on the NIFC AOA.

5.9.1 General Fueling Procedures

In order to service the aircraft promptly and efficiently upon arrival, the fueling attendant should obtain as much advance data as possible. This includes:

- Aircraft arrival and departure times
- Estimated quantity and grades of product required
- Determine fueling method - over wing, under wing
- Upon aircraft arrival, obtain quantity and grades of products required from the pilot or other flight crew member
- The aircraft must not be approached until it is stationary, the engines have been shut down, and it is ready for servicing. Helicopters must not be approached until blades stop rotating
- Fueling vehicles should be positioned with a clear path to permit rapid removal after fueling is completed or in the event emergencies arise. Consideration must be given to the location on the fueler's engine and location of the aircraft's fuel vent system. The fueling vehicle shall not be positioned where it would obstruct aircraft exits and loading areas. Aircraft Attendants will insure that refueler is properly chocked.
- All fueling operations must be conducted outside of hangars or similar enclosed buildings
- After the fueling vehicle is in position, fire extinguishers must be readily available and should be positioned conveniently for easy access. The attendant should use his/her own discretion
- Bonding is the process through which two conductive objects are connected together to minimize potential electrical differences. Bonding does not dissipate the static electricity. It equalizes the charges on two unlike objects such as an aircraft and a refueling nozzle, fuel truck bayonet bonding pin in order to preclude arcing, in the presence of flammable vapors, as the two objects are joined. You make this bond before you remove the nozzle dust cap or fuel cap so that if there is a spark, it will occur before fuel vapor is present. For the same reason you do not disconnect the nozzle bond until refueling is completed and the gas tank cap and nozzle dust cap have been replaced then if a spark occurs, only insignificant amounts of fuel vapor should be present, probably not enough to support combustion

5.9.2 Underwing Fueling Procedures

- Ensure aircraft is choked
- Bond fueling vehicle to aircraft
- Connect the delivery hose nozzle to aircraft fueling point, open the nozzle and place appropriate aircraft fuel switch to the "on" position, and activate fueling vehicle
- Start fueling, keep alert and take all precautions for safety. No one will be allowed to block a dead man in the "on" position. Under no circumstances shall the nozzle be left unattended during fueling
- Never overlook the possibility of an accidental fuel spill or leak from the aircraft or the fueling vehicle

Upon completion of fueling:

- Check fuel quantity dispensed with fuel quantity requested
- Disconnect the hose nozzle and replace the dust caps and aircraft fuel caps

- Remove all ladders or lower platform
- Remove the bonding cable from the aircraft to the fueling vehicle
- Remove fueling vehicle from aircraft area as soon as possible after servicing is completed

5.9.3 Overwing Fueling Procedures

In addition to the procedures given for under wing, where applicable, the following should also be applied:

- Ensure nobody is in aircraft, that all electrical power is off and aircraft chocked
- Always use suitable ladders and protective covers (Mats) if available to avoid damage to aircraft wing. Ladders left unattended in high wind conditions should be laid on the ground. Use extreme care to prevent hose or nozzle from damaging the deicer boot or leading edge of wing
- Connect bonding cable to suitable bonding point on aircraft
- Bond nozzle cap to fuel tank cap
- Open tank access, remove nozzle dust cap and insert nozzle, keeping a constant contact between the nozzle and the filler neck while fueling
- Start fueling, do not leave nozzle unattended in the fuel port during the fueling process, damage to the aircraft may occur. Make frequent visual checks of tank capacity, taking extreme care to prevent spillage or overfilling
- Upon completion of delivery, quantity in tank should be checked with fuel quantity requested against the meter reading
- Replace and secure fuel tank access caps, replace nozzle dust cap
- Return hose to fuel hose reel

5.9.4 Emergency Removal of Aircraft and/or Vehicles

These procedures, in case of a fire, are based on judgment factors of the conditions present, and size of the fire.

ANY person detecting a fire in areas where aircraft, vehicles, or persons, may be exposed to danger will immediately sound the fire alarm and initiate aircraft emergency removal from the area, when appropriate tow bars are available. Dial 9 911, give your name, the type and location of emergency.

During fueling or de-fueling operations, shutdown fuel and leave the vehicle. If the situation permits, remove the vehicle from the area to a safe place.

When a fuel spill occurs, mobile equipment and the aircraft may be withdrawn from the area or left as is until the spill is removed or made safe. No fixed rule can be made as fire safety will vary with circumstances. Shutting down equipment or moving vehicles may provide a source of ignition. Parked aircraft or automobiles, electrical cart, or spark producing equipment in the area should be started before the spilled fuel is removed or made safe.

A good safety practice is to not actuate any electrical switches unless absolutely necessary. If a vehicle engine is running at the time of the spill, it is normally good practice to drive it from the hazard area. If circumstances dictate that the vehicle should not be moved, but it should be shut down, engine speed should be reduced to idle prior to cutting ignition in order to prevent back fire. Non-involved vehicles should never be driven through a fuel spill or allowed in the immediate area before clean up.

5.9.5 Handling Fuel Spills

The primary purpose of this procedure is safety toward life, limb and property. Safety must always be kept in mind while handling fuel spills. A secondary consideration is ecology. Sound ecological practices should be used for removing fuel spills whenever practical.

It is the responsibilities of management to develop a general plan for handling fuel spills at each station and to assure that fueling personnel are aware of the plan. In the event of a fuel spill, whether on the ramp, at the loading area, or any other area, the action detailed may be appropriate, although each spill will have to be treated on an individual case because of such variables as the size of the spill, type of flammable liquid involved, wind and weather conditions, equipment arrangement, aircraft occupancy, equipment and personnel available.

Within the confines of every fuel spill, there is an area where fuel and air have combined to form an explosive mixture. The only element necessary to produce ignition is a spark. Every spill, no matter how small, should be treated as a potential fire source and should be investigated to determine the cause and necessary remedial action to be taken.

Fuel vapors are heavier than air and will seek the lowest level and remain there until dispersed. This fact should be kept in mind when evaluating the total situation. When there is any doubt about the severity of a fuel spill or how the spill should be best cleaned up or rendered safe, from both a safety and ecological standpoint, contact the local fire department, emergency #911.

Fuel soaked absorbents should be placed in closed metal containers and then removed to a safe area. Local regulations will determine the final disposition of these absorbents.

Ecology also must be considered. Since the collection and drainage system at each airport is different, local governmental agency regulations will determine the specific procedure for cleaning up and reporting fuel spills.

5.9.6 Action to be Taken When a Fuel Spill Occurs

- Post fire guard or in some cases, more than one may be necessary
- Notify the Fire Department, number 911
- All Aircraft Attendants must be aware of their actions when an emergency occurs. It cannot be over emphasized, the importance of the above steps and procedures for the safety of equipment, property, and personnel

CHAPTER 6 SECURITY

6.1 General

As tenants of the Boise Airport (Gowen Field) Ramp Services must comply with the following documents:

- Departmental Manual Part 352 Chapter 5
- Security Guidelines from TSA'S Publication A-001
- National Interagency Fire Center (NIFC) Aircraft Operations Area (AOA)

If an emergency should occur on the NIFC AOA, or within the Ramp Services building that is outside your authority and abilities, calling one of the following may be appropriate:

- Boise Airport Operations - (208) 424-5670
- Boise Police - 911
- NIFC Base Security - (208) 387-5915 Cell (208) 866-6666
- Notify Immediate Supervisor or Group Leader
- Any Incident requires a call to Airport Operations immediately– (208) 424-5670.

Management acknowledges that during shift work, working at night, and with limited personnel, maintaining a desired security level may not be possible. You are asked to do the best you can, and not discard identified protocol.

6.2 Hours of Operation and Contact Information

- Telephone number - (208) 387-5529
- Fax number - (208) 387-5785
- Ramp Services radio frequency - 135.675
- Normal hours of operation are 08:00 to 16:30, Monday - Friday, October – June
- Summer hours of operation are 08:00 to 18:30, Seven day a week, July – September
- Advise Ramp Services or the NICC at (208) 387-5400 if arriving or departing prior to or after normal business hours by aircraft on NIFC AOA for Aircraft Attendant availability.
- NIFC Security telephone number - (208) 387-5915 or (208) 866-6666

6.3 Access and Notification

6.3.1 Notification

All Government employees must notify Ramp Services via phone or in person prior to accessing NIFC AOA, with the following exceptions:

- Great Basin Cache Unit (FA-241) may access the NIFC AOA to deliver or pickup equipment, but must remain between buildings and safety line.
- Incident Communications Division (FA-261), RAWS (FA-261), Smokejumpers (FA-321), Boise Tanker Base
- All government personnel must remain within their immediate work area or notify Ramp Services of their intentions before accessing NIFC AOA.
- The above mentioned units personnel are responsible for the security of their buildings that access the NIFC AOA and their immediate work area.

6.3.2 Access General

Primary access to the NIFC AOA is through the Ramp Services Building.

Individuals not associated with the above mentioned exceptions needing access to the NIFC AOA must identify themselves and their intentions before entering the NIFC AOA.

- Pilots can notify Ramp Services of their intentions by flight plan, phone, in person, by Unicom, fax, etc., before accessing the AOA.
- All others must notify Ramp Services in person.
- Access to NIFC AOA only after notifying Ramp Services.
- Notify Ramp Service's via phone, in person or 135.675 when ready for engine start's and taxi for a marshaller when available.
- All arriving pilots notify NIFC Ramp Services of ETA, fueling need's, etc. on 135.675 when 10 to 20 minute's out.
- All persons accessing the NIFC AOA through the NIFC Buildings are required to show identification and state intentions.

Asking for identification is acceptable

- Recognized pilots, other government personnel and contractors are to be acknowledged.
- Personnel may attempt to enter the ramp without acknowledgment or permission.
- Personnel are to identify themselves.
- Ask for a picture ID, their intent, and purpose before they are allowed to exit the building onto the NIFC AOA.
- Personnel must have their picture identification on their person and displayed above their waist.
- Personnel with a Visitors Pass issued by the front Gate are not to access the NIFC AOA without an escort. If no Ramp Services personnel are readily available for escort, the request is to be denied, or they are to wait until an escort can be provided.

Persons insisting on accessing the AOA and that do so without permission will be reported to authorities as described below.

6.3.3 Aircraft Operations Area Access

- Vehicles will only be allowed onto the NIFC AOA with a Ramp Vehicle Pass issued by Ramp Services personnel.
- All vehicles on the NIFC AOA will be monitored.
- All individuals on the NIFC AOA will be required to display appropriate identification or a Visitor Pass with escort and will be monitored.
- Drivers of unrecognized vehicles on the NIFC AOA will be challenged as to their intent and authorization.
- Special one-time exemptions will be granted at the discretion of the Ramp Supervisor or Lead Attendant on duty

6.3.4 Vehicle Access to the NIFC AOA

Vehicles are not allowed onto the NIFC AOA without a Ramp Vehicle Pass issued by Ramp Services personnel. The pass number, issued by, date of issue, issued to, employer, type of vehicle, license number, expected return date, date returned, and returned to information is recorded on the Ramp Vehicle Pass Log and in the Ramp Services Daily Activity Log. A Ramp Vehicle Pass is only issued to persons needing NIFC AOA access on a regular basis for a specific purpose. Vehicle passes are to be clearly displayed on the dash-board of the vehicle. Examples of valid requests are aircraft mechanic vehicles and designated long-term operation vehicles.

All individuals that request permission to enter the NIFC AOA with a government or non-government vehicle are required to ask for permission from Ramp Services personnel before entering and provide pertinent information to the Attendant. Individuals may or may not be authorized to enter the NIFC AOA depending on aircraft activity and heightened security levels. If not allowed, the Ramp Services electric white cart can be supplemented for a private vehicle. To receive approval onto the NIFC AOA, the individual must enter the

Ramp Services Building or contact them from the intercom box at Gate #7 (east side of Ramp Services Building).

Drivers must observe all NIFC AOA safety procedures and regulations:

- Vehicles will yield to all aircraft traffic.
- When possible, vehicles will drive on the outside of the yellow safety line.
- Vehicles entering NIFC AOA will cross at 90 degrees (perpendicular) to NIFC AOA in order to have a clear view of the ramp activity.
- Vehicle speeds will not exceed 10 mph.
- Night time operations require astute precautionary practices when mixing vehicles, personnel, and moving aircraft.

Vehicles will not have access to the NIFC AOA for the sole purpose of transporting passengers to the aircraft, i.e., motel vans, personal motor vehicles, or government transportation. Vehicles will unload at the ramp gate or in the passenger loading area located in front of the Ramp Services Building. Passengers needing transportation to or from the aircraft and Ramp Services can use the white electric cart or Ramp pickup to transport baggage or equipment. Aircraft mechanics shall notify Ramp services of their intentions before entering the NIFC AOA via phone or in person. Pilots and aircraft mechanics must notify Ramp Services before performing engine runs. The best way to check in is to stop at Ramp Services before proceeding to the aircraft.

Local Fixed Base Operator (FBO) mechanics shall notify Ramp Services before entering NIFC AOA via phone, in person or 135.675, when dropping off or picking up agency aircraft, or performing mechanical duties for agency or contract aircraft.

6.3.5 Unrecognized Vehicles on the NIFC Aircraft Ramp

Drivers of unrecognized vehicles that have accessed the ramp without approval from Ramp Services personnel or the Tanker Base Manager are to be challenged as to their business and authorization. If there is no justification, that driver is asked to leave the NIFC AOA. If the driver has justification, he/she will be directed to Ramp Services personnel for authorization. If the vehicle is associated with the Retardant Tanker Base, the Tanker Base Manager is notified.

Situations of uncooperative individuals using vehicles on the NIFC AOA, with or without, a Ramp Vehicle Pass are documented. Base Security or local Law Enforcement is notified as necessary. The vehicle make, model, and license number and the driver's name (if known) is noted. This information is entered into the Ramp Services Log and the Ramp Supervisor and/or Lead Attendant are notified.

6.3.6 Access to NIFC through the Ramp Services Building

All individuals arriving by aircraft without government identification are escorted from the AOA and issued a Visitor Pass by Ramp Services personnel as per standard practices at the Main Gate for given security threat levels. The Visitor Pass is to be returned when the individual returns to Ramp Services to leave NIFC via aircraft, or when they exit at the Main Gate.

APPENDIX 1 HEARING CONSERVATION PROGRAM FOR RAMP SERVICES

Ear-Noise Hazards and Protection: It is required in the United States that a program for control and testing be initiated and maintained for employees who are exposed to sound levels exceeding the values shown below:

Permissible Noise Exposure

Duration Per Day (Hours)	Sound Level dBA (Slow Response)
8	90
6	92
4	95
3	97
2	100
1.5	102
1	105
0.5	110
.25 or less	115

The components of an effective industrial hearing conservation program are:

- Noise survey and evaluation to identify problem areas and employee exposure
- Determining of the feasibility of noise control through engineering means
- Consideration of administrative controls as a means of lowering employee exposure to an acceptable level by scheduling employees in such a way as to reduce the time they spend in areas exceeding permissible noise exposure
- The use of approved hearing protective devices if engineering or administrative controls are not feasible or as an interim preventative measure while they are being investigated or instituted
- Medical surveillance by conducting audiometric testing of all affected employees
- Education and enforcement of hearing conservation program policies and procedures

Where hearing protective devices are used, the degree of protection required must be the prime consideration but the factor of employee acceptance from a comfort standpoint versus cost must also be evaluated. Hearing protective devices fall into two main groups:

- Plug or insert type
- Cup or muff type

Commercially available earplugs, if properly selected, fitted, and used, will generally reduce the noise reaching the ear by 25 to 30 dB decibels. The better type of ear muffs may reduce noise an additional 10 to 15 dB

Plugs tend to be more effective in the lower frequencies, and muffs in the higher frequencies.

Noise can affect employees in several ways:

- Cause loss of hearing
- Cause fatigue and irritation
- Interfere with communication
- Other subtle effects not yet clearly defined

"Hear's" what it's all about

The human ear is an extremely delicate, highly sensitive instrument with astonishing efficiency. It is so

sensitive that in a very quiet environment one can almost hear the random collision of air molecules bouncing against the eardrum. Yet the ear can also withstand sounds that are powerful enough to set the entire body in vibration. The ear also has a frequency range of sensitivity from 20 to 20,000 Hz. See "Anatomy of the Human Ear", this section.

Our hearing, unlike our vision, is operative at all times, for it cannot be turned off as can our vision when we close our eyes. In addition, our hearing enables us to hear 360 degrees around us where as our peripheral vision enables us to see at only a range of about 180 degrees. The fact that our hearing constantly is "on" is what enables us to be alerted to a strange sound or the baby's cry in the midst of a deep sleep.

Selectivity in listening is another unique aspect of our hearing, due to our having balanced hearing in our two ears. It enables us to "tune out" a speaker or background music, for example, and "tune in" someone or something else. The deer hunter may not be able to "hear" his wife from across the room, but he can detect the snap of a twig from his tree stand.

Unfortunately, our ears and our remarkable hearing sensitivity are taken for granted, unappreciated, ignored and abused until there is a problem or a loss of hearing. Daily our ears are exposed to loud sounds at home, at work and at play. Too much exposure to certain sounds at too loud a level can damage the ear, initially causing a temporary threshold shift and finally a hearing loss that is permanent. Often the hearing loss is accompanied by intermittent or constant tinnitus, ringing in the ears, which can be extremely annoying.

A Hearing loss due to noise exposure affects the high frequency sounds first, causing the person to have difficulty understanding what is heard. If the hearing loss increases, the understanding difficulties become worse, often resulting in immeasurable social, psychological and emotional problems. Not only does the noise induced hearing loss create problems for the person with the loss, it also creates problems for his or her family, friends, co-workers and employer.

Currently, a noise induced hearing loss cannot be corrected through any type of medical or surgical intervention. It usually can be helped or "aided" through the use of personal amplification (i.e., a hearing aid). However, a hearing aid is simply a mechanical device; it cannot replace our normal hearing sensitivity. A noise induced hearing loss, however, can be prevented. IT NEED NEVER OCCUR. Our ears and our hearing are what keep us in contact with the rest of the world around us.

Hearing Protection

Employers shall make hearing protectors available to all employees exposed to 85 dB of noise or greater at no cost to the employees. Hearing protectors shall be replaced as necessary. In addition, the employer is responsible for providing a selection of hearing protection devices and is responsible for training the affected employees in the use and care of the hearing protection.

Finally the employer is responsible for determining the attenuation characteristics of the hearing protection devices.

The best hearing protection device is the one that is actually used and worn faithfully by the employee. To implement and ensure this, comfort is of prime importance. The effectiveness of the hearing protective device depends upon the following factors which are related to the manner in which the sound energy is transmitted through or around the device.

Seal Leaks

Small leaks in the seal between the hearing protector and the skin which can significantly reduce the low frequency attenuation; as the air leak becomes larger, attenuation becomes reduced at all frequencies.

Material Leaks

Leaks which permit transmission of sound directly through the material of the device.

Device Vibration

Vibration of the hearing protective device itself caused by exposure to external sound energy.

Bone Conduction

The level of sound reaching the inner ear by bone conduction would be about 50 dB below the level of air conduction; therefore, a perfect hearing protective device worn in or over the ear cannot provide more than 50 dB reduction below the level of air conduction.

The amount of attenuation provided by ear plugs and ear muffs on the market today ranges between 20 35 dBA with greatest attenuation in the higher frequencies.

Ear Plugs should be made of pliable materials. Disposable plugs are intended to be used once and then discarded. These are considered to be more hygienic than permanent, reusable plugs size is of critical importance with reusable permanent plugs, because ear canals are different, even in the same person.

All insert type plugs initially should be fitted to the individual by a trained person. It is essential that reusable plugs be kept clean.

The user should wash them, with mild soap and water before inserting them, and should store them in a clean place when they are not being used. A record should be kept of the type and size of the ear plug issued to every employee so that replacements and exchanges or substitutions can be issued easily.

Ear Muffs are sealed to the head with cushion seals, which may be filled with liquid or plastic foam. The cushions should be soft and easily replaced when damaged or soiled. The headband should maintain a comfortable but firm pressure on the head, and must withstand any attempt to reduce pressure by bending it out of shape. A reduced pressure by bending it out of shape. A reduced pressure could cause seal leaks and reduced attenuation of the muff. The muff should be as light as possible without sacrificing attenuation.

Some work situations may require the use of double protection ear plugs and ear muffs, to ensure a margin of safety. Both plugs and muffs have their advantages and disadvantages; therefore, a selection for the affected employees is recommended.



United States Department of the Interior

IN REPLY REFER TO:

1112(500)

BUREAU OF LAND MANAGEMENT
BOISE INTERAGENCY FIRE CENTER
3905 Vista Avenue
Boise, Idaho 83705

April 4, 1986

Memorandum

To: Chief, Branch of Supply
Attn: Ramp Personnel
From: Chief, Division of Management Services
Subject: Hearing Conservation Program for Ramp Services

Subject program is hereby transmitted and in effect as of this date. Please ensure that steps are taken to implement immediately.

William L Ward

Enclosure (4 pages)
Hearing Conservation Program for BIFC Ramp Services

Hearing Conservation Program for NIFC Ramp Services

Hearing Conservation Program

The program will consist of the following steps:

All ramp services personnel (Aircraft Attendants) will have an annual audiogram test performed by an authorized and/or licensed audio technician or physician.

Hearing protection, muffs, plugs, or inserts, provided by the Center, will be of the highest and/or best protection for each individual.

Audio tests will be at the expense of the Agency except for the following situation. Audio testing is required on a SF 78 Form (Request for Medical Examination). When a SF-78 Physical Examination is required; the cost including audio tests will be at the expense of the temporary employee. All temporary ramp service personnel will be audio-tested a second time, during their last week of employment.

Audiogram and graphic results of pre-and post-season tests will be reviewed by the Ramp Services Unit Leader and the NIFC Safety Officer. Indicated problem areas will be reviewed and addressed by the Ramp Services Unit Leader and the NIFC Safety Officer.

BLM/NIFC Personnel Office will maintain all employee audio test results.

All ramp service attendants will have adequate comfortable ear protection provided and will wear their designed hearing protectors during all warranted time while on duty.

Ramp service employees who do not follow established hearing safety regulations will be subject to appropriate disciplinary action.

Based on various reasons, additional noise sampling will be completed annually and/or at the request of the Chief, Ramp Services when he/she feels it is warranted. Employee training is very important. When workers understand the reasons for the Hearing Conservation Program's requirements and the need to protect their hearing, they will be better motivated to participate actively in the program and to cooperate by wearing their protectors and taking audiometric tests. Ramp employees will be trained at least annually in the effects of noise, the purpose, advantage, and disadvantages of various types of hearing protectors; the selection, fitting and care of protectors, and the purpose and procedures of audiometric testing. The training program may be structured in any format, different parts being conducted by different individuals and at different times as long as the required topics are

Hearing Conservation Program Standard

As outlined in OSHA's #1910.95, Hearing Conservation Amendment

(J) **Hearing Protection Attenuation** "The employer shall evaluate hearing protector attenuation for the specific noise environments in which the protector will be used.

The following readings are from OSHA-Boise Area Office noise sampling on September 27, 1985 of various ramp equipment and the contract Boeing 727. The sampling does not reflect various other types of turboprop and jet aircraft that regularly utilize the BIFC ramp, such as military and commercial airliners on take-off and run-up. Such readings should be taken from the middle of the ramp.

Type of Aircraft and Ramp Area	Reading
Evergreen International Boeing 727	
Aft Cargo Pit, Ground Power Unit On	95 dBA
Right Wingtip, Engines Up	105 dBA
Front Marshalling Position, Engines Up	97 dBA
Hobart AC-DC Diesel Power Unit	
Tug Side	101 dBA
Behind the Hobart	90 dBA
Hobart Controls	95 dBA
Power Unit MA 1A Jet Air Start	
Controls	125 dBA
Exhaust	121 dBA
MA2 Electrical and Air Unit	
Rear Control Panel, Idling	98 dBA
Air Compressor Panel, Idling	95 dBA
Electrical Panel, Idling	99 dBA
Rear Control Panel, Jet Start	130 dBA
Rear Control Panel, Air Start	117 dBA
Left Hand Side, Air Start	119 dBA
Air Compressor Panel, Air Start	104 dBA
Electrical Panel, Air Start	106 dBA
Rear Control Panel, Output Air On	111 dBA

Headset sound barrier
INC0-155 or Equal
dBA Rating: 23 or 16, depending upon how worn

Earplug sound, w/case dBA Rating 26

Noise Measurements on Ramp During Jet Start and Taxiing: June 17, 1998

Location	Action	dBA
Back latch directly under wings	jet fueling and APU running	94.1 to 94.3*
Rear exhaust directly under tail	as above	95*
Inside door of Warehouse Bay	as above	66*
Ramp	APU running - fueling completed	86 91 dBC - see note below
Ramp - Yellow Line	Engine Start	104** (peak)
Warehouse - first office next to Ramp	Engine Start	60.8**
Ramp - Yellow Line	Taxiing - parallel to Building	89.7***
Ramp - Yellow Line	Taxiing - turning away from Building	98-102.4***
Warehouse - first office next to ramp	Taxiing - turning away from Building	60.4***

* duration approximately 30 minutes

** duration approximately 30-40 seconds, then throttled back

*** duration approximately 2 minutes

Note: A reading which is higher on the C scale than the A scale indicates that exposure is mostly a low frequency noise. This is a general indicator only. Actual reading can only be determined using an octave-band analysis.

Note: Noise measurements taken with a NorthWest jet (DC-9) taking off on the main runway was 97.1 on the ramp. This was the peak level measured. The wind carried the noise from the runway. A United 737 registered 74.8 on landing. The Sierra Pacific jet registered 79.8 on take-off. No military aircraft was in use at the time of the survey.

Equipment	Location	dBA
Generator	ear level beside unit	102 - peak 102
	end of air hose - unconnected	118.2 - 118.5
Sweeper Truck	@ idle in cab - unit not running - windows open	73-74

Sweeper unit running - windows open 91-92

Sweeper unit running - windows closed 84-100 dBC - see above note

Hearing Conservation Glossary

Audiogram: The chart, graph or table showing Hearing Level in dB as a function of frequency.

Audiologist: A professional who holds a minimum of a Master's degree in Audiology and is concerned with the complete evaluation of auditory function and the habilitation of persons with hearing impairment.

Audiometer: An electronic instrument for measuring objectively the sensitivity of hearing in intensity and frequency.

Audiometric Technician: A person who has satisfactorily demonstrated competence in administering audiometric examinations, obtaining valid audiograms, and properly using, maintaining and calibrating audiometers, and who is responsible to an audiologist, otolaryngologist or qualified physician.

Base Audiogram: The initial audiogram against which all future audiograms are to be compared.

Calibrate: The procedure used to check an audio-meter for uniformity or accuracy.

Decibel (dB): The unit of measurement of sound level.

Hearing Level: The deviation in dB of a person's threshold from the zero reference of the audio- meter.

Hearing Protectors: Personal ear plugs or ear muffs designed to keep noxious noise from the ear to preserve hearing.

Hertz (Hz): The unit of measurement of frequency, numerically equal to cycles per second.

High Frequency Loss: Usually a deficit starting with 2000 Hz and beyond.

Noise: Any unwanted sound.

Noise-Induced Hearing Loss: The term used to describe the slowly progressive and permanent inner ear hearing loss which results from exposure to loud continuous noise over a long period of time.

Occupational Hearing Conservativonist: A person who is certified by the Council of Accreditation in Occupational Hearing Conservation.

Otolaryngologist: A medical doctor specializing in the diagnosis and treatment of disorders of the ear, nose and throat.

Presbycusis: The loss of hearing associated with aging.

Sound: The sensation produced through the organs of hearing by vibrations transmitted in a material medium, usually air.

Sound Level Meter: An instrument for the measurement of sound.

Temporary Threshold Shift: A loss of hearing resulting from noise exposure, all or part of which is recovered during an arbitrary period of time when the person is removed from the noise.

Threshold: The point at which a person just begins to notice the tone is becoming audible.

Tinnitus: A ringing sound in the ears.

APPENDIX 2 JOB HAZARD ANALYSIS FOR RAMP SERVICES

The following pages identify the hazards and mitigations

JOB HAZARD ANALYSIS FIXED WING / AIRTANKER BASE NIFC RAMP SERVICES			
U.S. Department of the Interior JOB HAZARD ANALYSIS (JHA)	WORK PROJECT / ACTIVITY FIXED WING/AIRTANKER OPERATIONS	LOCATION NIFC RAMP/BOI TANKER BASE	UNIT NIFC RAMP SERVICES
	NAME OF ANALYST DON HUBBARTT	JOB TITLE RAMP SERVICES TRAINING LEADER	DATE REVIEWED 4/10/2012
TASKS / PROCEDURES	HAZARDS	ABATEMENT ACTIONS	
Ramp Manager/Parking Tender Aircraft Directing, Parking and Clearing Aircraft, Vehicles, Pedestrian Movement	General Collisions with <ul style="list-style-type: none"> • Aircraft • Vehicles • Ground Equipment • Personnel 	Trained and authorized personnel only Establish positive communications through radio or hand signals Use a wingwalker in tight places Keep unauthorized vehicles off the ramp. Maintain control and supervision of vehicles authorized on the ramp Use a spotter when backing vehicles near aircraft Chock vehicles parked near aircraft Lower forklift forks when backing or driving Only trained and authorized persons use forklift around aircraft Keep unauthorized persons off ramp All authorized persons on ramp under Supervision or escort Wear high visibility vest Keep a safe distance from moving aircraft	
	Propeller Strikes with Personnel	Stay clear of props at all times whether turning or not Do not approach any aircraft until propellers have stopped moving Walk around wing not under it if at all possible Ramp personnel should never move a propeller	
	Blowing Debris/Jet Blast	Keep ramp clean Eye protection available Eye wash station available Light aircraft tied down or parked away from operating areas	
	Projections on aircraft surfaces <ul style="list-style-type: none"> • Pitot tubes • Flaps • Antennas, etc. 	Walk around wings not under them if possible Keep a safe distance from the aircraft while working near it Warn loading helpers about aircraft hazards	
TASKS / PROCEDURES	HAZARDS	ABATEMENT ACTIONS	
(Continued) Ramp Manager/Parking Tender Aircraft Directing, Parking and Clearing Aircraft, Vehicles, Pedestrian Movement	Dripping fluids <ul style="list-style-type: none"> • Fuel • Oil • Hydraulic fluids 	Stay out from under wings and engines whenever possible. Watch for fluid leaks, report leaks to the pilot	
	Falls	Don't run on the ramp Full coverage shoes or boots required Keep retardant and oil spills cleaned up	
	Turbine noise	Hearing protection required around turbine operations	

		This includes visitors and passengers.
	Sun exposure	Wear a hat if needed Sunscreen is available use if needed Keep well hydrated and keep water available
	Aircraft deficiencies	Before clearing aircraft look for open hatches, leaks, open access plates Remove before flight banners and equipment covers or plugs
	Fuel ignitions/fire	No smoking on ramp Knowledge of fire extinguisher use required Emergency response plan updated and reviewed with all employees
Ramp Manager/Parking Tender	All hazards associated with ramp management and parking	All actions to abate hazards with ramp management and parking
Transport Aircraft	Propellers	Stay out of propeller areas Route passengers around the wings No loading of passenger or cargo with props turning
	Noise	Hearing protection required when near turbine operations or running APU's
	Collisions	Keep all vehicles and persons away from aircraft until it has stopped taxiing Positive communications through hand signals or radio contact Use a wingwalker when conditions are right
	Projections on aircraft surfaces: pitot tubes, flaps, etc.	Walk around wings not under them if possible Warn loading helpers about aircraft hazards All persons on ramp under the direction of ramp manager
	Airstairs and doors opening into personnel	Keep all personnel way from doorways until the stairs have fully deployed
	Low headroom in cargo areas	Warn loading help of low headroom and cramped quarters
	Loose equipment in aircraft	Ensure that boots, shoes, canteens, hardhats, etc. are inside bags and not loose
	Falls	No running on the ramp Route persons around the ground equipment/airtanker loading hoses
TASKS / PROCEDURES	HAZARDS	ABATEMENT ACTIONS
Passenger Loading	Noise	Hearing protection for all persons near operating APU Do not allow passengers on ramp prior to engine shutdown
	Aircraft hazard areas not confined to: Propellers, GTC's, jet blast areas, projections...etc.	All passengers authorized on ramp must be under supervision or escort. No walking under wings
Cargo Loading	Shifting loads	Properly secure loads, use nets and straps No loose equipment on packs
	Slivers and smashed fingers	Gloves available if needed
	Back injury	Use proper lifting techniques
	Vehicle collisions	Use a spotter when backing Chock vehicles parked near aircraft
	Damage to aircraft external parts	Confine cargo loading activities to cargo area Don't walk or drive under wings unnecessarily
	Hazardous Materials	All transport of hazardous materials will conducted as outlined by NFES 1068 Aviation Transport of Hazardous Materials Guide Hazardous materials will only be loaded by persons trained in aircraft hazmat procedures
Airtanker Loading	General	Authorized and trained personnel only

	Back injuries	Use proper lifting techniques
	Hose breaks under pressure	Inspect hoses periodically Do not pump with valves shut Do not hammer valves shut against flow Wear safety glasses
	Falls in retardant or oil	Wear full coverage rubber soled shoes Keep retardant and oil spills cleaned up Do not run on ramp
	Retardant on persons	Close valves securely before disconnecting. Eye wash available and showers available Wear coveralls when loading retardant
	Oil on persons	Do not walk under the engines Do not walk under wings
Airtanker Loading (Hot)	Same as above plus...	Only trained and authorized persons
	Running engine propeller	Stay away from running engine Keep people and vehicles away from side with running engine
	APU exhaust burns	Stay away from APU's and hazard areas
	Hearing damage	Hearing protection required near operations
	Blowing debris	Keep ramp clean Eye protection available if needed
TASKS / PROCEDURES	HAZARDS	ABATEMENT ACTIONS
Retardant Mixing	General	Trained and authorized personnel only
	Falls	Take care walking among pipes and hoses Do not run or jump over hoses Use catwalks when on top of the tanks Keep the mixing area clean of spilled retardant
	Overloading	Pay attention to mix, and volume pumped Download the aircraft always if overloaded Check warning horn operation periodically
	Hose breakage under pressure	Check all valve positions open before pumping Inspect equipment periodically
	Retardant on persons	Take care when taking samples Eyewash and showers available Wear coveralls if needed
Aircraft Fueling	General	Monitor commercial fueling operations Ensure adherence to NFPA 407 standards
	Fuel ignitions	No smoking on ramp Cell phone use away from fueling ops Knowledge of fire extinguishers required Ensure proper bonding No retardant or passenger loading while fueling
	Fuel spills	Check operator equipment for leaks

		Stand-by fire extinguishers in place Emergency and recovery procedures in place Eyewash and showers in place Keep contact with dispatch to engage emergency response if needed
Helicopter Operations	General	Trained and authorized persons only
	Noise	Hearing protection required
	Dust and debris	Eye protection recommended Keep ramps clean
	Rotor strikes	Use proper handsignals Maintain positive communication with helicopter Secure loose items on heliport Keep head down when approaching helicopter Do not approach helicopter from higher terrain Stay completely away from rear of helicopter
TASKS / PROCEDURES	HAZARDS	ABATEMENT ACTIONS
Forklift Operations	General	Trained and authorized persons only
	Falling load	Be sure load is secure before moving forklift Carry load low
	Tipping over	Carry load low Drive on flat smooth surface only
	Cold fuel burns	Wear gloves while fueling
	Fuel fire	No smoking around forklift at any time
Tool Use	General	Trained and authorized persons only
	Noise	Wear hearing protection when using grinder, power saws or sanders
	Dust	Work in ventilated area Use a dust mask when needed
	Flying debris	Wear eye protection around grinder, saws, drills, etc.
	Sharp blades	Wear gloves when using sharpened tools Keep hands clear of spinning blades on any tool
	Electric shock	Check condition of equipment before using Do not use power equipment in wet environment
Lawn Mowing/Weed Eater Use	Spilled fuel	Use a funnel or pour spout
	Fuel ignitions	Allow engine to cool before fueling No smoking
	Noise	Wear hearing protection
	Dust and debris	Wear eye protection Wear coveralls Wear dust mask if needed
Vehicle Operations	General	Only authorized personnel will operate Government vehicles
	Moving accidents	Report all
	Fatigue	Stay within Bureau guidelines for rest vs. hours of operation.
	Vehicle roll and collisions	Use parking brake and chock blocks when parking on an incline

APPENDIX 3 FUELING PRECAUTIONS

This portion on fueling is added for information so that ramp personnel know why we require what we do when fueling aircraft and things to look for when the fueling is actually happening.

Static Electricity

The discharge of static sparks is a constant threat to safe fueling. This is why proper bonding is essential. When two dissimilar materials make physical contact and are then separated, a charge of static electricity is nearly always produced. Static electricity is generated when pumping any fuel through its system. The amount generated increases with the rate of flow, and a high rate of flow is normal today for the transfer of fuel in a relatively short period of time.

Static electricity can be generated by pumping fuel through a service hose, by allowing fuel to fall freely through the air from a filler spout into a tank, or by draining fuel from a tank or line into a container. A charge may accumulate on an aircraft during flight or on the ground.

Rain, snow, ice crystals, or dust blowing across the aircraft can create a heavy charge of static electricity. A passing cloud may also do this. The servicing vehicle, like any rubber-tired vehicle, may also become charged. Static can be collected by induction from an electrically charged atmosphere.

Static flows, like water, to a point of lower potential. If the individual metallic structures of an aircraft are bonded, or connected electrically, the flow will continue until the potentials equal. Static electricity flows along the easiest path, just as lightning follows the highly conductive copper lightning rod and cable into the ground. If no easy path is provided, a charge builds up. When this is great enough, an electric spark jumps a gap. Often, this spark is capable of igniting flammable vapors.

Smoking

Matches, cigarette lighters, and other smoking materials shall not be carried by any persons engaged in fueling operations or working around the aircraft. The "NO SMOKING" rule should be rigidly enforced. Fuel vapors may settle and travel long distances along the ground, thereby creating a hazard away from the fuel source.

Sparks

Electrical circuits may arc when connections are made or during faulty operation. The following precautions are recommended to prevent electric sparks:

Aircraft ground power units should be located as far away from fueling points as is practicable, and neither connected nor disconnected during fueling.

Aircraft electric switches, which are not necessary to the fueling operation, should not be operated during fueling, except in an emergency.

Aircraft radios should be left off.

Ramp Vehicles

Vehicles which are not properly maintained present a fire hazard during fueling operations. Such things as fuel leaks, electrical system shorts, arcs across terminals, sparks from the exhaust, or backfires can ignite flammable vapors, and should be corrected when first noticed. Vehicles with any of these conditions should be removed from the ramp until the problem is corrected.

No vehicles other than those performing aircraft servicing should be allowed within 50 feet of the aircraft during fueling.

Bonding

Aircraft must always be bonded, and the bonding wire should not be removed until the fueling procedure is complete. Always bring the bonding wire to the aircraft bonding connection.

The fuel truck operator is responsible for bonding the aircraft during fueling.

Bonding the fueling truck to the aircraft ensures that both the aircraft and the fueling vehicle are at the same electrical potential.

Caution! Do not attach alligator type clips to the aircraft structure, skin, doors, etc., as this will damage these areas.

Fueling

Smoking shall not be permitted while fueling is in progress.

If maintenance personal is working on or inside of aircraft, no fueling will begin until all personal are outside the aircraft and work has stopped. At least one member of the flight crew shall be at the aircraft during the fueling.

If unexpected vapors are detected, stop the fueling to ascertain the source. Fueling can be resumed only after the hazardous condition has been corrected.

Should any condition constituting a possible hazard occur during the fueling procedure, fueling should be stopped and resumed only after the hazard/condition has been corrected.

Aviation Petroleum Products

The assurance of delivering clean, dry fuel of the proper type has always been of the utmost importance to the airport service and support operations. Relatively simple yet effective procedures have been developed for handling aviation gasoline and turbine fuels.

Cleanliness of both Avgas and Jet Fuels is extremely important, but since the combustion process in a jet engine must be carefully controlled and monitored by sophisticated on board fueling systems, the need for turbine fuel cleanliness is even more critical and at the same time more difficult to maintain than is aviation gasoline.

Operational changes in jet aircraft dictate the use of clean and dry fuel. At high altitude, temperatures are much lower and water dissolved in fuel forms ice that can clog aircraft fuel lines and filters. Jet engine aircraft burn higher volumes of fuel per hour than piston engine aircraft, so the slightest fuel contamination will accumulate rapidly.

The maintenance of clean and dry fuel requires controls at every stage of production, storage and delivery to the airport. It is the operator's responsibility to insure that fuel quality is maintained from the time received into storage until it is delivered into an aircraft.

Aviation Fuels

Aviation Fuels are used for the operation of piston powered engines. In the past, there were three grades of general aviation gasoline. These were 80/87, 100/130, and Military use, 115/145. The grade 90/96 was eliminated many years ago. Today, 100 LL is readily available and is used by most gasoline powered aircraft. Aviation gasoline's average weight is 6.0 lbs. per gallon.

The multiple numbering system's used for the different grades of aviation gasoline, i.e., 100/130, refers to the lean and rich mixture performance numbers. This was necessary when large transport aircraft used large

powerful gasoline powered engines. Today, gasoline is primarily used in small privately owned aircraft that require 100 LL, (Low Lead).

Aircraft Attendants requesting Avgas from FBO's (Fixed Base Operators), must have knowledge of aircraft fuel usage, and request the proper fuel for that aircraft. When the requested fuel arrives, the attendant will check and insure that the proper fuel ordered is being dispensed into aircraft.

It is very important to note that some aircraft have words marked on the engine cowling such as "turbo" that can be misinterpreted by some individuals to mean "turbine" and be directly related to jet fuel. FBO's have been known to service gasoline operated aircraft with jet fuel. Attendants are to assure that ANY FBO fueling aircraft on the NIFC ramp is dispensing the correct fuel.

Jet Fuels

Aviation turbine fuels are used for powering turbo jet and turbo prop engines. There are several kerosene types of turbine fuel in use Jet A, Jet A 1, Jet-50, and the military's JP-8. Ramp Services currently is using military JP-8 kerosene fuel that is similar to other kerosene types but contains additives of anti-bacteria, anti-icing, anti-static, and antioxidant. JP-8's weight is 6.75 pounds per gallon. Jet A, A 1, and JP-8 has a maximum freezing point of -40 degrees C.

Identification of Aviation Fuels

The various grades of aviation gasoline are dyed different colors to aid in recognition. These colors have been established by international agreement. Turbine fuels, however, are generally colorless and/or a light straw color.

The coloring scheme for aviation fuels is as follows:

Avgas 100 LL	BLUE
Jet A	STRAW
Jet A 1	STRAW
JP 8	STRAW/COLORLESS

Causes of Fire

In the interest of fire prevention, the facility operator should be familiar with the more common causes of fires, especially those which involve flammable liquids. Before a fire can occur, three essentials must be present fuel in the vapor form, air (oxygen), and a source of Ignition.

Because of the nature of the liquid products handled, fuel vapors may be present at fueling sights in the proper proportion with air ratio to support combustion; i.e., in the case of gasoline, approximately 1 % (percent) to 8 % (percent) vapor by volume in air is combustible. Therefore, it is important to control all sources of ignition where such vapor air mixture may be present.

All employees involved with aircraft fuels, should be aware of ease of ignition and ignition sources. Flowing fuel can be ignited by self-generated static electricity. The fuel vapor-air mixture can catch fire and burn with explosive violence. To minimum the hazard of static electricity during refueling, bonding may be sufficient.

Ease of Ignition

The ease with which a fuel ignites depends on its physical properties or characteristics. The particular properties of aviation and turbine fuels that relate to ease of ignition are the flashpoint, flammability limits, vapor pressure, auto ignition, temperature, and distillation range and electro static susceptibility. The meanings of these characteristics are explained below.

Flashpoint

The flashpoint of a fuel is the lowest temperature at which the fuel's vapors will catch fire momentarily (flash) when exposed to a flame under test conditions. The flashpoint of AVGAS is approximately -50 degrees F. The flash point of JP 8 is a minimum of 100 degrees F. The practical meaning of these flashpoints is that AVGAS and JP 8 will give off vapors capable of forming ignitable mixtures at the normal range of temperatures and pressures in which aviation units operate. Therefore, the safe assumption is that the vapors of AVGAS and JP 8 are flammable. Do not become non-complacent about these fuels!!

Flammability Limits

The flammability limits of a fuel are the limits within which a vapor air mixture will ignite if sufficient heat is present. Mixtures that have percentages of fuel vapors below the lower flammability limits are too rich to burn.

The flammability limits for AVGAS are between 1.4 and 7.6 percent AVGAS vapor by volume; these percentages by volume in air may exist when the temperature is in a range between 50 degrees F. and +30 degrees F. For JP 8, the flammability limits are between 0.6 and 4.75 percent by volume; these percentages by volume in air may exist when the temperature is in a range between 100 F. and 106 F.

For practical purposes, this means that in most parts of the world where operating temperatures are within the flammable range for JP 8. AVGAS is a concern in cold climates. It should be assumed, when operating within these temperature ranges, that the vapor air mixture **is flammable**. In discussing the vapor pressure of a fuel, an individual must consider the unusual phenomenon that may occur in an aircraft crash. This phenomenon is the fuel mist, a fog of fuel droplets and air that is different from fuel vapor. A mist of this type could form if the aircraft fuel tanks rupture on impact. Extreme caution must be used around a fuel mist because it is as dangerous as vapor air mixture in terms of reaching the flammability limits of the fuel.

Vapor Pressure

The vapor pressure of a fuel is the pressure of the vapor at ANY given temperature at which the vapor and liquid phases of the fuel are in equilibrium in a closed container. Vapor pressure is a measure of the volatility of a fuel, the ease with which it passes from the liquid to the gaseous state. Vapor pressure is most commonly given by a method known as the Ried method where the pressure is measured at 100 degrees F. The practical meaning of these vapor pressures is that both AVGAS and JP 8 do give off flammable vapors at normal temperatures and pressures.

Autoignition Temperature

The auto ignition temperature of a fuel is the lowest temperature at which the fuel will catch fire spontaneously, independent of ANY other source of ignition. In tests, AVGAS has auto ignited at temperatures ranging between 825 degrees and 960 degrees F. JP 8 on the other hand auto ignites when it reaches 440 degrees to 480 degrees F. When a helicopter engine is idling (as it is during hot refueling, loading or unloading passengers or cargo) its exhaust temperature are between 470 degrees and 500 degrees F. After a jet engine is shut down (fixed wing jet engines) their temperatures stay in this range for a considerable time. If this engine heat were to be radiated to JP 8, it could raise the temperature of the fuel enough to cause auto ignition.

Electrostatic Susceptibility

The electrostatic susceptibility of a fuel is the degree to which the fuel will take on or build up a charge of static electricity. The amount of static charge that will build up in a fuel depends on many things, such as the type of fuel, the amount and kind on impurities (including air and water) in the fuel, and rate of flow.

Behavior of Fuels after Ignition

Other physical properties of AVGAS and JP 8 determine how these fuels behave after they ignite

Severity

Heat of combustion

One measure of the intensity or severity of a fire is the amount of heat that will be produced as the fuel burns. For AVGAS, the NET HEAT OF COMBUSTION is about 19,000 BTU's (British thermal units) per pound. This slight difference in heat output is not important in planning for fighting AVGAS and JP 8 fires because a fire in either fuel will be intensely hot.

Rate of Flame Spread

The other characteristic of the two fuels that relates to the severity of a fire is the RATE OF FLAME SPREAD (previous table). For AVGAS the rate of flame spread is between 700 and 800 feet per minute (about the length of 2 ½ football fields per minute). This quality of AVGAS means, that if a fire starts, it will spread with great speed, covering a large area in a very short time.

Controllability

Specific gravity

One of the physical properties of AVGAS and JP 8 that relates to fire control measures is the specific gravity of the fuel (its weight in comparison to the weight of water). The specific gravity of AVGAS is about 0.70 and the specific gravity of JP 8 is about 0.78. Since both of these fuels are lighter than water, both will float on it. For this reason, foams or dry chemicals should be used for combat AVGAS or turbine fuel fires rather than water.

Solubility

The other quality of these fuels that is important in terms of fire control measures is that the fuels will not dissolve in water. This means that regular foam concentrates (the types that are mixed with water to make foam) will work well on AVGAS or JP 8 fires. The additives in these fuels will not attack or break down water based foams.

Ignition Source Control

Smoking

Smoking is only permitted in designated safe locations and not on the ramp, in hangars or shelters, or in proximity to fueling equipment or aircraft. "NO SMOKING" signs should be conspicuously posted where flammable liquid vapors are normally present.

Matches and Lighters

"Strike anywhere" matches and single action lighters can be hazardous.

Open Fires

Open fires (i.e. exhaust from ground power equipment) should not be permitted on the premises. Positioning of ground powered equipment is extremely important in preventing safety hazards.

Power Equipment

Mowers, electric drills, grinders, polishers and other power equipment (except explosion proof type) should not be operated in areas where flammable vapors may be present. Attendants must keep this in mind when performing maintenance of fuel trucks, **and remember no ground power when aircraft is being fueled by overwing method.**

Heating Equipment

Heating equipment should be located so that it is not exposed to flammable vapors. Heating equipment, other than approved heater units installed eight (8) feet above floor level, should be located in a detached building or room designed to have a least a 1 hour resistance to fire.

Static

To minimize sparks from static electricity during aircraft fueling operations, vehicles should be electrically bonded by means of a bonding strap or cable. This bond should be made before the loading operation starts and should be maintained until the operation has been completed.

Clothing

Clothing worn by fuel handling personnel can cause static electrical build up. Care should be taken by fuel handling personnel in selecting the proper clothing not susceptible to this phenomenon.

Electrical Equipment

Electrical equipment, if defective or of the wrong type, may constitute a source of ignition. Therefore, such equipment, as well as circuits and fuses, should be maintained in accordance with local regulations, or "The National Electrical Code." Extension cords, portable tools, and appliances should be maintained in first class condition, and their use should be restricted to designed areas. (This applies to vacuums, power tools, washers, and other accessories which may be used on vehicles and/or aircraft). ANY part of the electrical system or equipment installed or used in areas where fuel or its vapors could be present should be of approved explosion proof design.

Rubbish

Combustible rubbish waste paper, packing material and oily or paint rags constitutes a ready fuel source for an accidental fire. The Vehicle Maintenance Bay is to be maintained as to not collect trash that may contribute to a hazardous situation i.e. used rags, or stacked cardboard. Covered metal containers should be provided for the confinement of such rubbish, and be emptied daily. No barrels or drums, empty or full, and no combustible materials shall be permitted within 10 feet of ANY fuel truck.

Outside Fire Sources

Frequently, fires endangering fuel trucks ordinate on adjacent properties. These fires may spread from their sources in dry grass and weeds. Good housekeeping, including elimination of grass and weeds, will minimize the spread of outside fires into the parking areas.

Vapor Control

When volatile flammable liquids are exposed to the atmosphere, combustible vapor air mixtures may be formed. Transferring such liquids to an open container releases vapors to the surrounding atmosphere. Whenever possible, this type of operation should be done with caution.

Truck Filling

Bottom loading is preferred, but if top loading, the use of extension spouts to deliver liquid to the bottom of a tank minimizes the vapors released in the truck loading operation. Splash fueling creates a very hazardous condition.

Leaks

Volatile flammable liquids which leak from containers, fuel truck piping or aircraft, are conducive to vapor accumulation. Therefore equipment should be maintained in a non-leaking condition.

Spills

Any spilled product should be removed or covered immediately. In the event of a major spill or overflow, fuel operations in the vicinity should cease until the area has been made safe. The fire department should be notified immediately of ANY major spill or overflow.

Switch Fueling

When fuels having a flash point of less than 100 degrees F. (37.8 C.) are mixed with fuels having a flash point about 100 degrees F. either by addition of the higher flash fuel to the lower flash fuel or vice versa, the resulting fuel air vapors have new and usually broader flammability characteristics, thus increasing chances of a ignitable mixture. In such cases there is an increased risk of fire and explosion unless adequate precautions are taken to prevent ignition from any source of flammable fuel air vapors in the fuel tank. The flow rate for fuels with flash points below 100 degrees F. should be one half the normal.

Cleaning Solvents

Gasoline is a motor fuel, not a cleaning solvent. Gasoline must NOT be used for cleaning. Only petroleum products such as kerosene or Stoddard solvents whose flash point is above 100 degrees F. are suitable for cleaning purposes.

Ventilation

Natural or mechanical ventilation shall be provided in any building, room, or enclosed space where accumulation of flammable liquid vapors is likely. The Vehicle Bay door should be open when working on vehicles.

Other Aviation Hazards Pertaining to Fuel

Contaminants

The common aviation fuel contaminants are water, solids, surfactants, micro-organisms, and miscellaneous contaminants, including the intermixing of different grades or types of fuel. Although the human element causing contamination can never be eliminated, it can be minimized through careful design of fueling facilities, good operation procedures, checks, and adequate training of personnel. The highest levels of cleanliness should be maintained and proper handling practices meticulously observed.

Fuel Truck Filter Changes

It is imperative that the fuel filter not be handled bare handed. Natural oils of the body will incapacitate the ability of the filter to repel dissolved water and will allow the water to enter the fuel and be pumped into the aircraft. If possible new fuel filters are covered in plastic, the plastic is to be removed only after the fuel filter is installed, otherwise use other means to handle the filter. It is important that the filters not be handled with the bare hands.

Solids

Solid contaminants are generally those which are insoluble in fuel. Most common are iron rust, scale, sand, and dirt. However, metal particles, dust, lint from filter material and rags gasket pieces, and even sludge produced by bacterial action are included. The maximum amount and size of solids that an aircraft engine can tolerate varies with its type and fuel system. Close tolerance mechanisms in turbine engines can be damaged by particles as small as 1/20th the diameter of a human hair.

Controlling Solids

The best method of controlling solids is to eliminate, or at least limit, their introduction into the fuel. Internal coatings of nonferrous materials, such as aluminum, should be used particularly between the filter and/or filter/separator and the loading point. Alloys containing cadmium, copper, or zinc (galvanized) are not to be used. Covers and caps must be kept tightly closed until ready for use. Care is to be taken to prevent lint from wiping rags or airborne contaminants from entering the fuel system during filling or fueling operations. Dust caps must be replaced after they are used.

Removing Solids

The most common method of removing solids from fuel is the passage of fuel through a filter and/or fuel/separator. These filters, filter/separators, nozzle screens, and other filtering media must be regularly

inspected and maintained in order to do their job.

Water Types

Water

Water occurs in aviation fuel in two forms, dissolved and free or entrained. Water can enter an airport system through leaks in the seals of such items as dome covers, floating roofs, and hatches during rains or when equipment is washed; through leakage during marine transport in tankers and barges and through condensation of moisture in the air on walls of tanks.

Dissolved Water

Dissolved water in fuel is similar to humidity in air. All aviation fuels will dissolve water in varying amounts, depending upon the fuel composition and temperature. ANY water in excess of that which will dissolve is called free or entrained water. Dissolved water is not detrimental to aircraft operation as long as it remains in solution. Although dissolved water cannot be removed by filtration, it can become free water with temperature change. Once free, it can thus cause operating problems. As fuel is cooled, water comes out of solution at a rate of about one part per million per degree Fahrenheit (1 ppm/deg. F.). This free water process is analogous to the condensation of water vapor out of air in the form of fog.

Free Water

Free water can appear in either bulk quantities or as entrained water. Bulk quantities are often called "water slugs" and, as the name implies, are relatively large in size and are visible as a body or layer. Entrained water is suspended in tiny droplets in fuel, and will cause the reflection of light. When present in large numbers, the fuel appears cloudy or hazy. When a water slug and fuel are violently agitated, as in passing through pump entrained water will result. This usually will settle out in time depending on droplet size, specific gravity, viscosity of the fuel, and currents within the tank. Because of differing physical properties, a water haze may be formed by lowering the temperature of a fuel saturated with dissolved water. Entrained water droplets can unite, or coalesce, to form large drops of free water.

Free Water in Aircraft Engines

Aircraft engines will tolerate a small amount of free water 30ppm is usually considered to be the maximum if it is in a fine, uniformly dispersed state. It is also true that substantial amounts of free drops occur. Most aircraft are protected by filter heating devices which can deal satisfactorily with dissolved water which comes out of solution, but there is little margin for handling free water. Thus, no free water in the form of water slugs or entrained water can be tolerated in a fuel handling system and must **NEVER** be delivered into an aircraft. **The best way to minimize the amount of water entering a system is through inspection and maintenance of equipment and by making certain that only clean and dry fuel is received.**

Additives

Additives, such as Ethylene Glycol Mono Methyl Ether (EGME) which is approved for optional use as an anti-icing additive to turbine fuels, are put in at the refinery, at airport storage facilities or injected by the servicing vehicle.

JP-8 has the following additives:

- Anti-Static, ASA-3
- Icing Inhibitor and Anti-Bacterial
- Ethylene Glycol & Ether
- Corrosion Inhibitor
- Reduces Corrosion
- Increases Lubrication

- Anti-oxidant

Surfactants

The term "Surfactants" is a contraction of the words Surface Active Agents. These soaps or detergent like materials, often sulfates that may occur naturally in the fuel may be introduced into the fuel by ANY of the following means: inadvertently by certain refining processes; certain additives; washing off of internal surfaces during passage through distribution system; and storage in a tank or vessel which had previously handled other products. Surfactants are usually more soluble in water than in fuel and reduce interfacial tension between water and fuel.

This causes water and dirt to remain in suspension in finely dispersed droplets or particles for an extended period of time. They are attracted to filter/separator elements and can make these elements ineffective. They also tend to plate out on metallic surfaces and adhere to these surfaces until surfactant rich water droplets are formed which will then run down the side of the vessels and form puddles in the bottom or in the sumps.

Surfactants alone do not constitute a great threat to filter/separator action they increase the likelihood of aircraft/fuel contamination. Thus surfactants have become one of the major contaminants in jet fuels and can cause fuel gauge problems, effecting the transmitter, bulb, etc.

Limits

No maximum surfactant limit has been established which can be safely tolerated in a fuel. Surfactant contamination of an airport fuel facility is gradual and is dependent upon the volume of fuel handled and the surfactant content of that fuel. For example, a facility handling a large quantity of fuel containing low levels of surfactant may become more contaminated in time than a low volume facility with high levels of surfactant. In general, the maximum surfactant level which can be tolerated in fuel is that level where the facility's ability to remove water and solid contaminants is unaffected.

Testing for Surfactants

No simple field tests exist for determining surfactant levels in fuels. However, the "White Bucket" test or visual test using a clear glass jar is helpful in detecting the presence of concentrations of surfactants in aviation gasoline and turbine fuel. All that is required is a clean white bucket or a clear glass jar and water which have been in contact with the fuel in tank bottoms, filter/separators, or other points where surfactants are likely to accumulate. Surfactants, if present, will appear as a brown sudsy water layer on the bottom of the jar or bucket or at the fuel/water interface. Unfortunately, evidence of surfactant is after the fact evidence appearing as a sudsy like liquid after gross contamination has occurred.

Danger Signals

Excess quantities of dirt and/or free water going through the system
Free water content above 15 ppm in product discharge for a filter/separator is suspect
Lacy or heavy scum at fuel water interfaces drawn from storage tanks or filter sumps
Opaque water, including black water, drained from tank bottom and filter sumps
Malfunctioning or rapid plugging of filter and/or separators
Dark Millipore's on filter/separator product discharge which do not show usual particulate matter
Slow water settling rates in storage tanks

Micro-Organisms

Microbial growth can occur where water is present in the fuel. The conditions most favorable to their growth are warm temperatures and the presence of iron oxides and mineral salts in the water. The principal effects of micro-organisms are formation of a sludge or slime which can foul filter/separators and aircraft fueling mechanisms, emulsification of the fuel, creation of corrosive compounds, and offensive odors. Severe corrosion of aircraft fuel tanks has been attributed to micro-organisms and considerable expense has been

incurred removing microbial growths and repairing or replacing corroded aluminum panels in wing tanks.

Microbial Content

Microbial content or number of colonies in a given sample of fuel can be determined in the laboratory. ANY evidence of microbial growth or debris, which may appear as a black sludge or slime, or even a vegetative like mat growth, must be removed from filter/separator cases, fueler tanks, and storage tanks. Growth also appear as dark brown spots on the filter/separator element sock. These elements must be replaced whenever this condition is discovered.

Microbia Prevention

Because microbial thrive in water, a simple and effective method to prevent or retard their growth is to eliminate the water. **The introduction of water into fuels must be minimized, and free water must be removed from storage tanks, filter/separator sumps, and fuelers whenever it is discovered during routine checks.**

Miscellaneous Contaminants

Miscellaneous contaminants can include soluble or insoluble materials or both. Fuel can be contaminated by the mixing of fuels; by picking up lead or other compounds from rust and sludge deposits; by zinc from galvanized metals, coatings, or corrosion protection anodes; by additives; or by ANY other of a number of contaminant sources.

Human Error

The greatest **single** danger to aircraft safety from contaminated fuels cannot be attributed to solids, micro-organisms, surfactants or even water; it is contamination resulting from human error i.e. touching new vehicle fuel filter with bare hands while installing. Body oils inactivate the water repelling ability of the filter and allow water to enter the fuel. It is the placing of the wrong grade or type of fuel into an aircraft, the mixing of grades, or **any** other type of human error that allows off specification fuels to be placed aboard the aircraft. The possibility of human error can never be eliminated, but it can be minimized through careful design of fueling facilities, good operating procedures and checks, and adequate training of personnel. **Any fuel which is suspected to be off specification because of contaminants or mixing with other fuels must not be placed aboard an aircraft.** A mistake made in placing fuel aboard an aircraft can be corrected on the spot if the pilot is informed. If the pilot is not informed, an accident may result with tragic consequences.