1510 AVIATION MANAGEMENT

Mission--Aviation Management includes all activities associated with providing aircraft support services for natural resource protection and management functions of the Department of Natural Resources and Conservation. Support services incorporate program leadership supervision, cooperation, aviation expertise, and training and safety program management for both fleet and contract aircraft operations.

Authority--Guidelines covering aircraft usage and operations within the Department are contained within the Department's Air Operations Manual. Reimbursement of employees when using own or rented aircraft is contained in DNRC Aircraft Use Management Guidelines (see Annex A).

Objective--Manage aviation functions and activities to achieve the following results:

A. Safe, cost-effective aviation services in support of the Department's mission, goals and objectives.

B. Coordination of aviation activities and operations with those of other agencies and cooperators to meet mutually agreed-upon standardized goals and objectives and to achieve program efficiencies.

C. Maintain, manage and operate a fleet of purchased and Federal Excess Personal Property (FEPP) aircraft within the applicable rules and regulations of the Federal Aviation Regulations' (FARs) State and FEPP guidelines as set forth in this manual.

Policy

D. ***Department Flight Operations***--Ensure that Department flight operations comply with the FARs applicable to public aircraft engaged in natural resource missions and with Public Law 106.181. Additionally, conduct flight operations in accordance with the following FARs applicable to civil aircraft for all passenger-carrying operations.

1. Public Law 106.181.

2. FAR 39 - Airworthiness Directives (14 CFR Part 39).

3. FAR 43 - Maintenance, Preventative Maintenance, Rebuilding and Alteration (14 CFR Part 43).

4. FAR 61 - Certification: Pilots and Flight Instructors (14 CFR Part 61).

5. FAR 65 - Certification: Airmen Other Than Flight Crew Members (14 CFR Part 65).

6. FAR 91 - General Operating and Flight rules (14 CFR Part 133).

7. FAR 133 - Rotor Craft External Load Operations (14 CFR Part 135).

8. FAR 135 - Air Taxi Operators and Commercial Operators (14 CFR Part 135).

9. FAR 137 - Agricultural Aircraft Operations (14 CFR Part 131).

E. ***Federal Excess Personal Property (FEPP) Guidelines***--States that acquire aircraft through this Federal Excess Personal Property (FEPP) program shall use the aircraft only for fire protection activities or other emergency use activity. The States requesting aircraft must be able to justify FEPP aircraft on the basis of their own needs.

Personal use is not to be made of FEPP, including FEPP aircraft. Incidental use of any individual aircraft beyond 10 percent of the total flight time for that aircraft in any one year is prohibited. Document violations in accordance with Section 21 of FSH 3109.12 FEPP may be used during emergency situations in which there is a threat to life or property. (See Annex I - USFS Approval Letter.)

Renting of FEPP aircraft is not permitted. If incidental use of FEPP aircraft is authorized or assistance is rendered, it is permissible to recover the cost of operating the equipment. Use rates should not include depreciation, amortization, or replacement costs.

Government competition with private industry should be avoided. Because of the inherent advantages that government agencies have, including the use of FEPP, it is unfair for state or federal agencies to bid against the private sector or otherwise compete with them. The government should not use FEPP to provide services for others in non-emergency situations when there are commercial services available. (Reference Annex H - Public/Civil Aircraft Utilization Documentation Record for Montana DNRC Aircraft.)

Forest Service aircraft (excess property) on loan to state forestry agencies are subject to recall if not used in accordance with excess property regulations (1900 Manual--Federal Excess Personal Property Desk Guide, Chapter 40).

F. ***Use of Department Aircraft***

1. Department aircraft are used in the normal course of official business. The Air Operations Section Supervisor/Chief Pilot will ensure that Department aircraft meet all the necessary standards and conditions for the safe transport of Department personnel. Department-owned aircraft will only be piloted with pilots approved through the Air Operations Section.

2. Priority:

   a. Priorities for aircraft use are established and changed depending on the goal of the Department; training is a high priority.

   b. State emergencies, i.e. fire, floods or other life-threatening situations, will be given immediate attention with approval through proper Department channels. Fire is a normal Department function.

G. ***Passenger Policy***--DNRC flights are for official purposes only. Passengers that have official state business and/or essential to the mission are approved for DNRC flights. Passengers are not limited to state employees; they may be:

1. Contractors hired by the state.

2. Contract maintenance personnel.

3. Other state, federal, city and county employees.

4. Volunteer firefighters on state or county fires.

H. ***Rental/Charter Aircraft***—Aircraft may be rented or chartered with pilots from fixed base operators or cooperators when it is in the best interest of the Department to do so. This may be when there is an emergency, such as a fire or when state-owned aircraft are either not available or not suitable for the specific mission. Rental aircraft and pilots will meet the standards of Part 135 of the Federal Aviation Regulations and applicable Department standards. Rental or charter aircraft will be coordinated through the Air Operations Section or the local Interagency Zone Dispatch Centers. Department employees can only fly in chartered/rented aircraft that meet the minimum DNRC pilot and aircraft standards. Aircraft and pilots that are used for fire operations must meet the minimum standards in The State Cooperators Aviation Standards for Interagency Fire

I. ***Use of Personal or Rented Aircraft by Department Employee Pilots***-- Under specific guidelines, Department employees may pilot their own or rented aircraft for the conduct of Department business. (See Annex A - DNRC Management Guidelines.)

These guidelines are necessary to ensure the safe conduct of Department affairs. Employees must first receive approval from their respective Administrator prior to any flight and must meet the following requirements.

1. Employee pilots must meet the following qualifications and be approved by the Air Operations Section Supervisor/Chief Pilot:

    a. Valid FAA Pilot Certificate (private or higher).

    b. Appropriate FAA Medical Certificate.

    c. Minimum of two hundred hours pilot in command.

    d. Maintain currency in type of aircraft in accordance with Federal Aviation Regulations.

2. Flights should be advantageous to the state and be within the capability and experience limitations of the pilot.

3. Flights will not be authorized to carry other employees or passengers, freight or cargo, or to perform detection, reconnaissance, or similar or specialized missions.

4. All flights will be conducted under FAA regulations, and flight plans will be filed for each flight with the appropriate flight service station.

5. Flights shall be made in daylight hours under visual flight rules.

6. Reimbursement will be in accordance with current DNRC travel guidelines based on nautical point-to-point mileage. (P-DNRC-OP-2) (See MCA 2-18-503(4))

J. *Use of Department Helicopters*

1. Ensure that State helicopter operations comply with applicable requirements in this manual and the applicable interagency guides available from the National Interagency Fire Center (NIFC).

   a. Those portions of the Interagency Helicopter Guide (IHOG) that are not exempted here in and written over in this manual. Use most recent IHOG as reference.

   b. Interagency Aerial Ignition Guide.

   c. Interagency Helicopter Rappelling Guide.

2. **State helicopter operations are primarily used for initial attack fire suppression activities. It is our goal to provide effective aircraft support to a strong, ground-based initial attack fire suppression program. The State's UH-1H's are operated as public aircraft in accordance with Public Law 106.181, Sec 702; (Advisory Circular AC 00-1.1A - Public Aircraft Operations) They will be certificated as DNRC Public Aircraft.**

3. On State, city, county, private and federal lands under State direct fire protection, the State aircraft are allowed to provide fire support as requested by the Incident Commander (IC). On State, city, county private and federal lands under federal direct fire protection, State aircraft are only allowed to provide fire support to meet an imminent threat, if commercial aircraft are not available (as defined in local operating plans).

4. State initial attack aircraft on Federal fires shall be released from an initial action as soon as practical. If continued aircraft action is needed on an incident, an order shall be placed for a replacement aircraft. When the replacement aircraft arrives at the incident, the State aircraft may be released for further initial action standby.

1511 **Scheduling**--Scheduling is the function of the Air Operations Section. The Air Operations Section schedules aircraft to accomplish departmental missions and/or support department operational plans, for use by the Land Offices and other agencies for the pre and post season. Land Office personnel will schedule from June 1 – Sept 30 flights for the Department for their assigned aircraft. Aircraft assignments will be made by the Section Supervisor.

1512 **Coordination**--Coordination of aircraft is the function of the Fire Bureau. Any movement of aviation assets or need for additional aviation support is done by the Bureau Chief or his designee. The Air Operations Section will assist the Fire Bureau Chief in proper use and placement of aircraft and can be delegated the authority to move State aircraft for effective use.

1513 **Dispatch of Aircraft**--Dispatch of aircraft is the function of the dispatchers at each Interagency Zone Dispatch Center or Area Office for fire missions. Aircraft assigned to the areas can be dispatched for any Fire Mission allowed under this manual. Pre- and post-season non-fire dispatching will occur at the ASF.

1514 **Air Operations Working Team (AOWT)**--The Air Operations Working Team is responsible for the oversight and constructive flow of information for planning of the Department aviation functions. The team is made up of representatives from the area land offices.

The Air operations working team will meet quarterly and when called by the Chair, who is the Air Operations Section Supervisor/Chief Pilot. The AOWT reports directly to the Fire and Aviation Bureau Chief and or the Fire Advisory Committee (FAC).

1515 **Needs Assessment**--To best assist the DNRC Fire program managers with their aviation needs, the Fire and Aviation Bureau will monitor what the most efficient level is. This will be determined by assessing and evaluating the Departments ability to keep 95% of all direct protection wildfires at 10 acres or less. In addition the Bureau will monitor the Aviation costs of both DNRC aircraft and contract aviation resources used for firefighting. This will aid in the decision making process to ensure the fleet is at the most efficient level. The number of aircraft the Department is operating has been effective in meeting the goals of limiting the costs of containing wildfires. The future needs may include replacing the 2 Bell Jet Rangers with UH-1 helicopters. This would provide a more capable helicopter platform for both the State wide and direct protection missions. If funding was available to support sufficient staffing levels, the Department would develop the 2 long term storage UH-1's to the MT 205 standard that could perform the direct protection and state wide mission.

1516 **Federal Crew Members**--A DNRC flight that has crew members that are Federal employees will be fully compliant with the requirements of IHOG. If the IHOG requirements cannot be met then the flight will not proceed with the federal employees / firefighters on board without approval from the Region 1 Aviation Officer for the USFS or from Aviation Management Directorate.

1520 PERSONNEL

1521 Responsibility

A. ***Director, Department of Natural Resources and Conservation***--The Director is responsible for final approval of aviation plans prior to field operational use, and new aviation equipment and technology which affects aviation operations.

B. ***Administrator, Forestry Division (State Forester)***--The Forestry Division Administrator reviews and recommends approval or denial of aviation plans and technological changes in the aviation operations and related personnel. He/she may delegate the action to the Chief, Fire and Aviation Management Bureau

C. ***Chief, Fire and Aviation Management Bureau***--The Bureau is responsible for Department-wide functions related to aircraft services and facilities. The Bureau is a unit of the Forestry Division of the Department of Natural Resources and Conservation. The principal aviation functions are delegated to the Aviation Section, Section Supervisor/Chief Pilot.

1522 Aviation Personnel

A. ***Introduction***--The Air Operations Section is charged with managing a fleet of aircraft and aviation personnel in a constant state of readiness for support to Fire and Aviation Management. Training, maintenance and planning are essential for Air Operations to provide this support in a safe, effective manner. The Air Operations Section has direct responsibility over all safety of flight items such as maintenance and budgets to maintain this state of readiness. This chapter will establish common duties and responsibilities, qualifications, certification, and training criteria for individuals functioning in aviation positions.

B. ***Organization***

1. **Air Operations**

a. Air Operations Section Supervisor Aviation Manager/Chief Pilot--The Air Operations Section Supervisor/Chief Pilot is responsible for the general administration, supervision and direction of all air operations for the Department. This position provides the administration, budget/finance accountability, and management of the entire natural resource aviation program for the State of Montana. The supervision of this program requires a complete understanding of all aviation issues in order to create a safe and efficient aviation program. The size and complexity of this program requires an extensive understanding of the in-house maintenance program and aviation maintenance management

practices for a wide variety of aircraft and flight missions. The incumbent must stay qualified in all aspects of natural resource aviation. The incumbent must be able to maintain effective working relationships with a wide variety of aviation experts, both within and external to the Department. The incumbent must be knowledgeable of all policies, regulations, guidelines and laws, both state and federal, which govern air operations. The complexity of position is further enhanced by the control of an inventory program for sensitive and controlled items, with a value exceeding 35 million dollars.

b. Pilot II/Safety Technician--The Pilot II/Safety Technicians coordinate and supervise Department flight operations and personnel; establish and administer aviation standards; and provides liaison to Land Offices concerning aviation issues. These positions provide supervision for the safety and training functions and everyday support to Department air operations. The size and complexity of air operations requires a detailed safety and training program, developed and administered by the incumbents. They must remain qualified and current in all phases of aviation operations including; flying both fixed and rotary wing aircraft, all regulations, all policies and any guidelines that govern aircraft use or employment. This is a critical function of the Department aviation program, requiring expertise in the air and on the ground. The assignment is extremely complex, involving a diverse fleet of aircraft with many different missions.

c. Seasonal Pilot - Fixed Wing--performs fire patrol flights, maintains and forwards aircraft records to air operations office, and meets other department aviation needs when requested. The pilot is attached to a land office for the fire season and is operationally controlled for the day-to-day scheduled activities by the Fire Program Manager or his designee. The pilot will be operationally assigned to perform the following duties:

1) Provides pilot service to the Department while remaining proficient in all aspects of fire aviation in compliance with FAA and Department policy, in order to fly fixed wing aircraft.
2) Remains current in all aspects of fire aviation to include: aerial photo, fire patrol, insect and disease survey, and personnel transportation.
3) Responsible for briefing all personnel and implementing flight and operation plans.
4) Responsible for conforming to the DNRC Air Operations 1500 Manual.

5) Flies routine fire patrol missions, initial attack operations in mountainous terrain, and administrative flights when scheduled.
6) Responsible for maintaining flight/maintenance records in accordance with the DNRC Air Operations 1500 Manual.
7) Responsible for cleaning and washing of the aircraft.
8) Ensures scheduled and other maintenance of the aircraft is brought to the attention of the Department's maintenance inspector.
9) Responsible for the daily preflight inspection of the aircraft to ensure its airworthiness.
10) Available on-call by phone or pager, furnished by the Department, during an established work schedule. Pilot must respond within a timeframe established in accordance with the Land Office Mobilization Plan while assigned to a land office.

d. Seasonal Pilot - Rotary Wing--performs initial attack flight operations, maintains and forwards aircraft flight/maintenance records to the Air Operations Officer, and meets other Department aviation needs as requested. The pilot is attached to the Land Office for the fire season and is operationally controlled for the day-to-day scheduled activities by the Area Manager. The pilot will be assigned to perform the following aviation duties:

1) Provides pilot service to the Department while remaining proficient in all aspects of fire aviation in compliance with FAA and Department policy, in order to fly rotary wing aircraft.
2) Remains current in all aspects of fire aviation, to include aerial photo, sling loading, vertical reference long line, water bucket operations and mountain flying.
3) Responsible for briefing all personnel and implementing flight and operation plans.
4) Will utilize personal protective equipment (PPE) in accordance with the DNRC Air Operations 1500 Manual.
5) Responsible for placing/retrieving firefighters by helicopter.
6) Responsible for dropping water or retardant by helicopter.
7) Performs routine missions for fire patrol, provides initial attack operations in mountainous terrain, and administrative flights when scheduled.
8) Responsible for cargo operations including placing/retrieving internal loads or external loads via sling load including Vertical Reference/long line.
9) Responsible for delivering supplies to line crews.
10) Responsible for maintaining flight records in accordance with the DNRC Air Operations 1500 Manual.

11) Responsible for cleaning and washing of the helicopter.
12) Ensures scheduled and other maintenance of the aircraft is brought to the attention of the Department's Maintenance Inspector.
13) Responsible for the daily preflight inspection of the aircraft to ensure its airworthiness.
13) Available on-call by phone or pager furnished by the Department, during an established work schedule. Pilot must respond within a timeframe established in accordance with the fire danger, while assigned at a land office.
14) When pilots are assigned away from their normal duty station (Helena), pilot will be available for additional aviation-related duties providing all other tasks previously listed have been accomplished. Fire Program Managers or their designee's must carefully consider any additional tasks that may adversely affect the successful accomplishment of the possible missions. If in doubt, contact the Aviation Safety Officer or Chief Pilot. (See Annex D - Pilot Supervision Matrix MOU.)

e. Aircraft/Maintenance Inspector--The Aircraft/Maintenance Inspector is responsible for the airworthiness of Department and contract aircraft. The incumbent provides maintenance management expertise necessary to ensure aircraft availability, reliability and control operating costs for the Department's aircraft. It is the Maintenance Inspector's primary responsibility to provide technical and professional expertise to achieve these goals. The incumbent manages the daily and long-term aspects of the aviation maintenance program while providing the technical and hands-on support necessary to maintain a complex fleet of airplanes and helicopters for the Department. This incumbent is also responsible for maintaining an accurate inventory of sensitive and costly aircraft parts necessary for maintaining Department aircraft. The goal is 100% availability. The goal is met through strict adherence and compliance with Federal Aviation Administration regulation, Department of Agriculture - USFS regulations and guidelines, military and manufacturer guidelines, and service bullet applicability to the Department aircraft.

f. Aircraft Mechanic -- The Aircraft Mechanic is responsible for the airworthiness of the Department and contract aircraft. The incumbent performs inspection and maintenance tasks necessary to ensure the Department's aircraft are operated in a safe and airworthy condition. The incumbent performs routine inspections, maintenance, repairs and alterations in accordance with Federal Aviation Administration (FAA) regulations, the aircraft manufacturer's instructions and Departmental

requirements. The Aircraft Mechanic's knowledge and experience level will be utilized when addressing safety of flight issues such as incident/accidents, Airworthiness Directives, and manufacturer bulletins.

g. Helicopter Manager –The Helicopter Manager will be qualified in accordance with NWCG 310-1. Additional guidance for training can be found in the DNRC Helitack Training Guide or the Interagency Helicopter Operations Guide (IHOG). Helicopter Manager hiring, training, supervision, and certification are Land Office responsibilities for assigned aircraft.

C. ***Flight Qualifications***

1. Only fully qualified pilots will be assigned the responsibility of performing natural resource flight operations. Department pilots in air operations will:

   a. Possess a current, valid Federal Aviation Administration commercial certificate with appropriate rating for aircraft and mission. All pilots are required by the FAA to take periodic physical examinations. Full-time pilots may charge the cost of the examination and the travel expenses necessary to obtain such an examination to the Department. The pilot will secure at least a second class FAA medical certificate.

2. Minimal Experience Level for Initial Employment--The following minimum experience for initial employment or appointment as a natural resource pilot is suggested:

   Air Operations Section Supervisor/Chief Pilot -- Pilot I

   Must meet the following minimum flight experience:

(1)	Total Flying Time	2,000 hours
(2)	Pilot in Command	1,500 hours
(3)	Rotary Wing Turbine	1,500 hours
(4)	Multi-Engine	200 hours*
(5)	Night Flying	100 hours
(6)	Instrument Flying under IFR	100 hours
(7)	In Category and Class offered	250 hours
(8)	Extended Cross-country	200 hours
(9)	Typical Terrain-Mountainous	200 hours
(10)	Last Twelve Months	100 hours
(11)	Last Sixty days	10 hours
(12)	Designated Department Check Airmen	

* Can be waived by the Chief Pilot/Section Supervisor.

Safety/Training Officer/Pilots

Must meet the following flight experience:

(1)	Total Flying Time	2,000 hours
(2)	Pilot in Command	1,500 hours
(3)	Rotary Wing Turbine	1,500 hours
(4)	Multi-Engine	200 hours*
(5)	Night Flying	100 hours
(6)	Instrument Flying under IFR	100 hours
(7)	In Category and Class offered	250 hours
(8)	Extended Cross-country	200 hours
(9)	Typical Terrain-Mountainous	200 hours
(10)	Last Twelve Months	100 hours
(11)	Last Sixty days	10 hours
(12)	Designated Department Check Airmen	

* Can be waived by the Chief Pilot/Section Supervisor.

Seasonal Pilot - Rotary Wing

Must meet the following flight experience:

(1)	Total Flying Time	1,500 hours
(2)	Pilot in Command	1,500 hours
(3)	Rotary Wing Turbine	1,500 hours
(4)	Night flying	100 hours
(5)	In Category and Class offered	100 hours
(6)	Extended Cross-country	200 hours
(7)	Typical Terrain-Mountainous	200 hours
(8)	Last twelve months	100 hours
(9)	Last Sixty days	10 hours

Seasonal Pilot-Fixed Wing

Must meet the following flight experience:

(1)	Total Flying Time	1,500 hours
(2)	Pilot in Command	1,200 hours
(3)	Each Class-Single and Multi-Engine	100 hours
(4)	Night flying	50 hours
(5)	In Category and Class-last 30 days	5 hours
(6)	Extended Cross-country	100 hours
(7)	Typical Terrain-Mountainous	50 hours
(8)	Last twelve months	50 hours
(9)	Last Sixty days	10 hours

Military Pilots must meet all flight hour requirements listed above for Pilot-in-Command Time.

D. ***Proficiency Requirements for Department Pilots***--Performance of flying duties, which involves piloting single-engine and multi-engine airplanes and helicopters during day, night, and instrument weather under specialized or hazardous conditions, requires well-developed special skills and related judgment, which must be maintained by frequent practice. Department pilots should maintain flight proficiency on the basis of the following minimum requirements, which may be met by actual working missions or practice flight.

1. **Instrument Flight** * - one hour each 30 days, of which at least one hour shall be in an aircraft.

2. **Night Flight** * - three night flight takeoffs and landings during each 60 day period.

3. **Helicopter Flying** * - one hour each 30 days, or ten hours within sixty days of working missions.

4. **FEPP Aircraft** - two hours per month.

5. **Aircraft Type** - five takeoffs and landings during each 60-day period in each category class and type of aircraft.

6. **Emergency Practice in Multi-Engine Airplanes** - one hour each 60-day period to consist of simulated engine failure and its effect on takeoff, landing, control, and performance. Emergency landings and equipment emergencies should be included.

Note: (*) Items which may be waivered or changed at the discretion of **Aviation Section Manager**

E. ***Pilot Conduct***

1. Serious violations of Federal Aviation Administration regulations or Department directives or instructions by pilots and other air personnel in the Department air operations will be reported immediately to the Air Operations Section Supervisor /Chief Pilot, and Safety Pilot, Fire Program Manager and the Chief of Fire and Aviation Bureau. The report will be brief, including name, employer, type of work being performed, and nature of violation.

2. Persons allegedly committing serious violations will be temporarily relieved from agency air operations work, pending investigation and disposition of the case. For pilots, the Department qualification card will be withdrawn temporarily. Pilots will not resume flying duties prior to being approved by a Department check airman. This approval can include ground training, flight training, or a combination of both.

3. Department pilots must maintain a high degree of flying proficiency and set a high standard of conduct which will reflect confidence in the operation of Department aircraft and bring credit to the Department.

4. Pilots shall not undertake any flight while suffering the after effects of alcohol overindulgence or medicines/drugs that may cause impairment.

5. Pilots, while on duty, shall use discretion in appearing in places which might reflect discredit to the Department.

6. It is the pilot's individual responsibility to ascertain that he/she gets the needed amount of rest required for the use of all his/her full capabilities.

7. For serious infractions or safety violations, pilots will appear before a flight evaluation board consisting of selected members of the Air Operations Working Team called by the Chief Pilot or Aviation Safety Officer. The board will make recommendations to the Fire and Aviation Bureau Chief and/or the fire advisory council.

F. ***Pilot-in-Command Responsibilities***

1. The pilot is in command of the aircraft, and his decision will take precedence in all affairs having to do with the aircraft and mission as per Federal Aviation Regulations.

   a. Safety of aircraft occupants and cargo.

   b. Postponing, changing, or canceling flights when existing or impending conditions make those operations unsafe.

   c. Complying with orders of authorized agency officials when those orders will not violate Federal Aviation Regulations, agency directives, or endanger the aircraft, occupants, or cargo.

   d. Must be familiar with operating area and special hazards.

   e. Provide for the comfort and safety of passengers.

   f. Review the plan of operation with air and ground personnel.

   g. Thoroughly brief all passengers regarding route of flight and mission details.

   h. Ensure proper loading of aircraft.

   i. Perform other duties as described in the job description.

1523 Pilot Duty Time

Pilot Flight and Duty Time Limitations--Flight time is not entirely reliable as a gauge of accumulative pilot fatigue and will vary with individuals. Sound judgment is essential in administering air operations to provide maximum safety.

A. Helicopter and airplane pilots, except those flying military transport aircraft, scheduled aircraft, or aircraft operated under irregular air carrier certification, should be limited to the following flight hours.

   1. Flight time will not exceed a total of eight hours per day.

   2. Pilots accumulating 36 or more hours of flying in six consecutive days will be off duty the following full calendar day--42 hours maximum in any six-day period.

   3. Pilots must have a minimum of ten consecutive hours off duty within 24 hours after the beginning of any duty.

   4. Duty includes flight time, ground duty of any kind, and standby or alert status at any location.

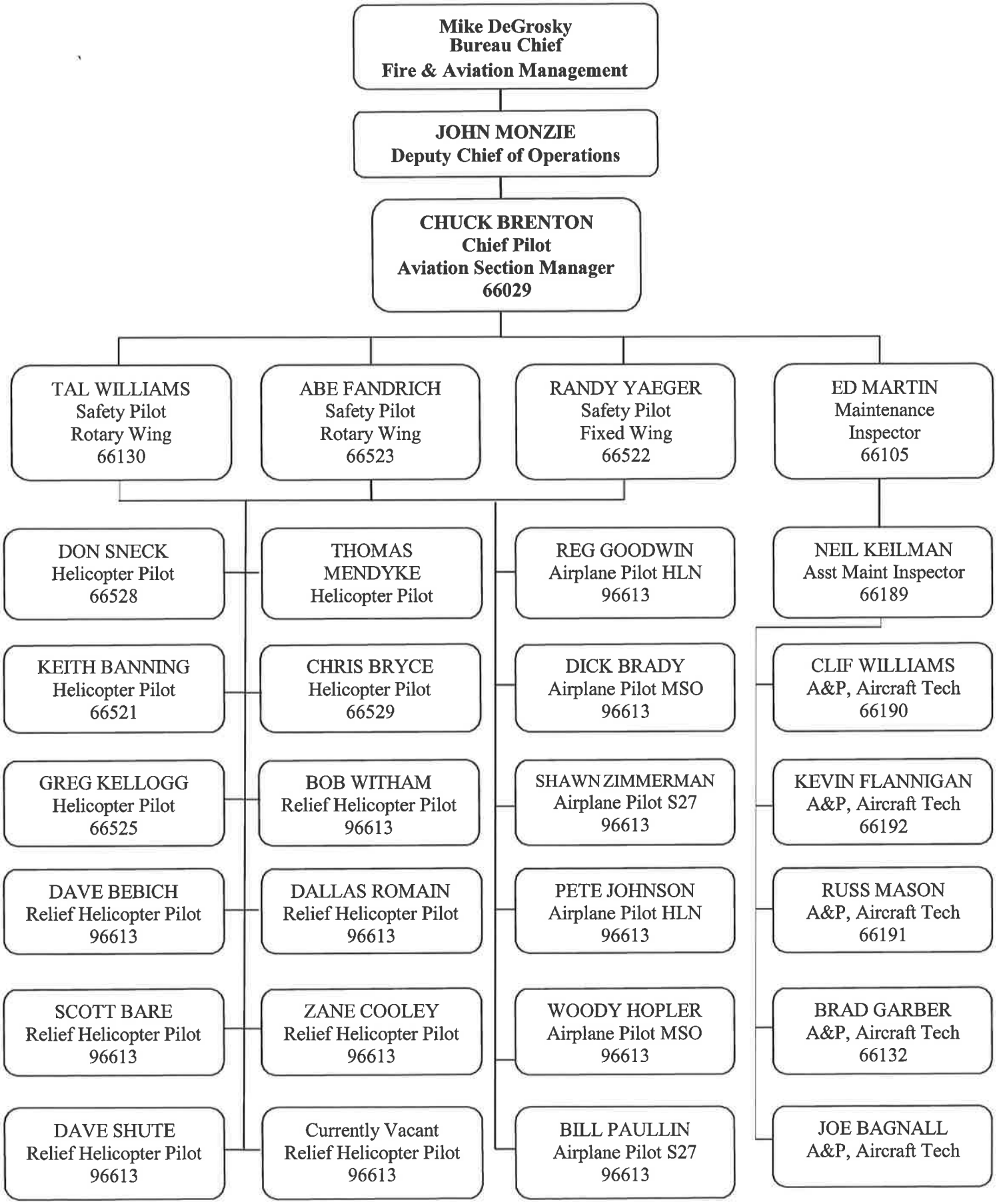
   5. During any fourteen consecutive days, pilots will be off duty for two full calendar days. Days off duty need not be consecutive.

   6. A duty day is any day a flight is made or 4 hours or more of other duty is performed, except for off-duty time.

B. Pilots flying airport-to-airport personnel or cargo transport missions will comply with FAR Part 121. Certificated contractors will comply with FAR Part 121 flight time limits.

C. Pilots flying missions covered in Item B above who are also flying other Forest Service missions will be limited to the duty and flight tour limitations in Items A-1 through A-6.

D. The Chief Pilot may waive the "consecutive" part of Item A-3, so that pilots flying such missions as a real application may have two shorter off duty periods, provided they aggregate 10 hours or more.


Mike DeGrosky
Bureau Chief
Fire & Aviation Management
JOHN MONZIE
Deputy Chief of Operations
CHUCK BRENTON
Chief Pilot
Aviation Section Manager
66029
TAL WILLIAMS
Safety Pilot
Rotary Wing
66130
ABE FANDRICH
Safety Pilot
Rotary Wing
66523
RANDY YAEGER
Safety Pilot
Fixed Wing
66522
ED MARTIN
Maintenance
Inspector
66105
DON SNECK
Helicopter Pilot
66528
KEITH BANNING
Helicopter Pilot
66521
GREG KELLOGG
Helicopter Pilot
66525
DAVE BEBICH
Relief Helicopter Pilot
96613
SCOTT BARE
Relief Helicopter Pilot
96613
DAVE SHUTE
Relief Helicopter Pilot
96613
THOMAS
MENDYKE
Helicopter Pilot
CHRIS BRYCE
Helicopter Pilot
66529
BOB WITHAM
Relief Helicopter Pilot
96613
DALLAS ROMAIN
Relief Helicopter Pilot
96613
ZANE COOLEY
Relief Helicopter Pilot
96613
Currently Vacant
Relief Helicopter Pilot
96613
REG GOODWIN
Airplane Pilot HLN
96613
DICK BRADY
Airplane Pilot MSO
96613
SHAWN ZIMMERMAN
Airplane Pilot S27
96613
PETE JOHNSON
Airplane Pilot HLN
96613
WOODY HOPLER
Airplane Pilot MSO
96613
BILL PAULLIN
Airplane Pilot S27
96613
NEIL KEILMAN
Asst Maint Inspector
66189
CLIF WILLIAMS
A&P, Aircraft Tech
66190
KEVIN FLANNIGAN
A&P, Aircraft Tech
66192
RUSS MASON
A&P, Aircraft Tech
66191
BRAD GARBER
A&P, Aircraft Tech
66132
JOE BAGNALL
A&P, Aircraft Tech

1524 **Security and Location of Aircraft**--The Helena Regional Airport is the home base for DNRC air operations. There is a 30,000 square foot winter maintenance/storage facility for the general maintenance and security of the DNRC aircraft and related FEPP parts. During the harsh winter months the helicopters are stored and maintained in this facility. The Cessna 182 is stored in a hangar in Missoula, and the C-185 is stored in a hangar in Kalispell during the winter months.

During the fire season 1 June – 30 Sept, aircraft are assigned to land offices for fire support.

Helena Central Land Office	--	Cessna 368M
		UH-1 388M
Harsh weather storage/security base ASF Hanger.		
Missoula Southwestern Land Office	--	Cessna 6312B
		UH-1 387M
Harsh weather storage/security base At SWLO		
Kalispell Northwestern Land Office	--	Cessna 391M
		UH-1 394M
Harsh weather storage/security base – Kalispell City		
Helena ASF State Wide Fire Suppression		UH-1 395M
		UH-1 398M
Helena ASF	--	Jet Ranger 384M
Helena ASF	--	Jet Ranger 392M

Any aircraft left unattended shall be secured and locked with proper wind gusts and tie-down equipment installed. Engine intake covers shall be installed at the end of the duty day, in a field, overnight environment. The DNRC Chief Pilot/Safety Pilot will determine if the aircraft must be relocated to a more secure area due to the threat level and general security of the aircraft. If security personnel are unavailable, aircraft will be moved to a secure location.

1530 FINANCE

1531 **Introduction**--The Department of Natural Resources (DNRC) directs most of its fire protection efforts towards keeping wildland fires as small as possible. The Department has established the primary goal of controlling 95% of all direct protection fires at 10 acres or less, so all fire management plans emphasize early detection and rapid initial attack to meet this goal. Analysis of suppression expenditures shows that the smaller the wildfire, the smaller the suppression expenditures. The cost of resources damaged and/or lost is also minimized.

The National Fire Management Analysis (NFMAS) evaluations for DNRC indicate improved efficiency by employing aircraft in firefighting. These studies also indicate maximum efficiency is gained by stationing a fixed-wing patrol plane and a medium helicopter in each of the State's direct protection areas for ready response from the middle of June to the end of September, or approximately 120 days of availability. The Department continually uses the NFMAS to reevaluate its needs for firefighting resources, and it also assesses the best way to acquire the necessary aviation services. We strive to get the best aviation services for firefighting at the most reasonable cost to the taxpayer. The Federal Excess Personal Property (FEPP) program is the program that affords the State the opportunity to achieve this goal.

1532 **Accounting**--The Department Air Operations Section is funded by an internal service account (proprietary account).

A. The internal service account (Responsibility Centers 52001 through 52020) was established to maintain money to pay for the day-to-day operating expenses of the Department aircraft and also hold some money in reserve for major repairs or overhauls from year to year so the aircraft are always maintained in a safe and cost-efficient manner.

Direct operating costs such as fuel, oil, radio repairs, annual inspections, 100-hour inspections, normal airframe repairs, engine overhauls, and other maintenance needs are all financed by the internal service account. Funding for this account is derived from a user's fee based on an hourly rate. The hourly rate is recalculated each year for all the aircraft and issued as a change to this part of the manual, if necessary.

The hourly rate structure was established by averaging direct costs for the operation of Department aircraft recorded in SABHRS and by reviewing operational cost data by aircraft manufacturers' recommendations.

B. ***General Fund Transfer***

The administrative part of the internal service account is related to flying operations for personal services, facilities rent, insurance, etc., which are budgeted and shown in responsibility center 52010. This is general fund and assessment money which represents the State's share to the aviation

program. The funds in the administrative account are constant except for inflation and additional increases necessary to administer the aviation program for the Department.

1533 **Flight Log**--The Department of Natural Resources and Conservation directs the Air Operation Section Supervisor/Chief Pilot to monitor the hourly operating cost of each Department aircraft and make the appropriate changes in the hourly rate for each aircraft. See Annex E for Aircraft Billing Form.

Aircraft rates are changed in order to maintain adequate funds in the aircraft internal service account. Current rates are:

Fixed wing $175.00/hour
Jet Ranger..... $515.00/hour
MT-205 Huey..... $1650.00/hour

These rates will be reviewed each year and changed as necessary to maintain adequate funds in the internal service account to maintain the aircraft in a safe state.

A billing format (Annex E) is used that facilitates the accumulation of hours flown per aircraft and initiates the billing process; this is the aircraft use record, and is a three-copy form. The DNRC Record of Aircraft Use is a record of all flight activity conducted by the Department using DNRC aircraft. DNRC aircraft are used primarily for fire management missions, but are also used for other administrative purposes. The mission is usually ordered by a dispatch center in support of DNRC or cooperating agency (USFS, BLM, BIA, county) operations. Each flight must be assigned a billing code responsibility center number. Fire management missions on behalf of our cooperators are assigned an Agency Support (7####) number or County Assist (8####) number. ALL FLIGHTS MUST BE ASSIGNED TO A RESPONSIBILITY CENTER.

A manager is assigned to each aircraft operating in a dispatch zone. It is the responsibility of this manager to collect flight information for each mission flown on the zone by a DNRC aircraft. This data is forwarded to the Fire and Aviation Management Bureau for consolidation and review, to the DNRC Chief Pilot for further review and approval, and to Central Services Division for accounting. Fire, passenger, cargo and retardant information is also collected for fire missions and is used for a variety of aircraft usage analyses.

The approved data base/electronic billing program, Lotus Approach, is used for all cost and flight accounting.

Record of Aircraft Use shall be forwarded to the Fire and Aviation Management Bureau, Missoula, to the attention of Fire & Aviation Management personnel by the first Friday of the month following.

1540 SAFETY & TRAINING

A. ***Objective***--The primary objective of the Department's Aviation Safety Program is to provide a system for the identification and reduction of hazards associated with aviation operations.

B. ***Aviation Safety Philosophy***--Aviation safety and aircraft accident prevention in the Montana Department of Natural Resources and Conservation is based on the philosophy that all aircraft accidents can be prevented and that accident prevention is an inherent function of management. Application of approved practices is a fundamental responsibility of managers and supervisors. Aviation Safety Philosophy is an area in which supervisory performance and accountability must be emphasized. The responsibility for aircraft accident prevention lies with every individual involved in an aviation operation. Pilot, flight crew, passengers, maintenance and ground crew play a role and must apply sound professional judgment. All personnel must perform according to established requirements and operating procedures. The pilot is always in command of the aircraft. The pilot's word will be final as to whether a mission can be conducted. All personnel working in and around helicopters will use the following safety procedures.

1. **Accident Prevention Plan** - The Department has developed a training program that trains personnel to specific standards for accomplishing routine and specific mission tasks. In addition, the Department will identify and train for emergencies that might occur while performing mission-related tasks. The Aviation Safety/Training Officer will assist aircraft users to ensure all personnel associated with aircraft operations have received the training necessary for their safety when performing duties related to air operations. The Aviation Safety/Training Officer will maintain files on all accidents and incidents, so as to detect trends in specific areas of operation.

2. **Safety Hazard Reduction** - The success of the Aviation Safety Program requires that hazards be identified and reported prior to that hazard causing an accident. The procedure to be followed once a hazard has been identified is to report it to the Aviation Safety/Training Officer immediately. The Aviation Safety/Training Officer will ensure that the required procedures are provided through training and/or information sharing so that the hazard will not recur. This process will prevent an accident or incident because someone was not informed.

3. **Education and Awareness** - The Aviation Safety/Training Officer shall maintain close contact with other aviation organizations (federal, state and civil) for the purpose of aviation safety information sharing. The Safety Officer will collect and maintain correspondence, safety publications, employee suggestions and input relating to aviation safety. That information will be distributed throughout the organization. The Aviation Safety/Training Officer will at minimum disseminate the above information with the employees directly under the supervision of the Air Operations Section.

1541 Personnel Safety

A. Personnel must be instructed in and follow these safety requirements:

1. Keep clear of helicopter rotors at all times. Unless work requires being nearer, all personnel out of the safety circle (75 ft. for Type three helicopters, 90ft. for type two, and 110 feet for Type one helicopters). When approaching nearer than these distances, approach from front or from side near front. Do not approach a hovering helicopter from any side.

2. Before taking off, fasten and adjust shoulder harness and safety belt. Keep safety belt fastened until instructed by pilot after landing to leave the aircraft.

3. Helicopter passengers will not approach or leave the helicopter until authorized by the pilot. The passenger should leave or approach the helicopter in a direction that will permit the pilot to see him until clear of the rotors.

4. No person will be carried in a helicopter carrying sling loads, or when operating with any load as a helitanker, sprayer, or duster, except under the following conditions:

   a. Crew members may be allowed on board the helicopter while the Department check airmen are conducting formal training or as approved by the Chief Pilot and or Safety Pilot.

5. Personnel should never be directly under the bucket. Water, retardant, or buckets must not be dropped on people. Personnel should never place themselves directly under the bucket.

6. No extra lines or ropes of any kind should be used to help guide the bucket. This is extremely dangerous and could cause lines to get into the rotors.

7. Unless equipped with eye-protecting goggles or glasses, or at least 100 feet from the helicopter, do not watch landing, takeoffs, or hovering operations.

8. Avoid loose headgear; it can easily damage rotors or become a serious safety hazard when persons instinctively try to recover it when it blows away.

9. Watch out for long-handled tools, pipe, poles, or like items; windows and rotors are easily damaged.

10. Flights near the ground along hot fire lines should be made just outside the fire, since rotor blast will then be from outside toward the fire.

11. Helicopters flying over a hot fire line must be at sufficient altitude to prevent the rotor system from fanning the fire itself.

B. ***Ground Safety***

1. **Procedures**

a. All personnel engaged in helicopter operations should wear ear protection.

b. Approach or leave helicopter only when authorized by pilot or responsible personnel.

c. Approach the helicopter only from the front or side, and always in such a manner that allows the pilot to see you at all times.

d. Always depart and approach the helicopter at a slight crouch.

e. When on uneven ground, approach the helicopter from the downhill side.

f. When approaching the helicopter with long-handled tools, hold tool handles parallel with the ground and keep them clear of the main rotor path.

g. Loose headgear should be carried in hand, to prevent its being blown off by rotor down wash. Chinstraps will be used on hard hats.

C. ***Flight Safety***

1. **Procedures**

a. Always ensure seat belt is properly fastened.

b. Do not smoke.

c. Keep clear of controls.

d. Hold maps and papers securely while in flight.

e. Wear chin strap when in flight. If chinstrap is not available, hold hard hat securely under arm or in hand.

f. Keep oriented at all times.

g. Keep alert for hazards, particularly power and telephone lines. Inform pilot of their presence and, when requested, assist pilot in watching tail rotor clearance during landings at field landing areas.

h. Do not throw objects out of helicopter while in flight.

i. Do not move about the cabin area while in flight.

j. Maintain radio communications at all times.

k. Pilot will approve all missions. Pilot's word is final as to whether or not the flight can be made.

1542 Crash Landing

A. Keep seat belt (and shoulder harness if available) as tight as possible.

B. Passengers in forward-facing or sideward facing seats should lean forward, chest against knees, with arms clasped under legs.

C. Passengers in rearward-facing seats should sit up straight with back and head braced against the seat back.

D. Know where emergency equipment (first-aid kit, portable extinguishers, ELT, etc.) is located.

E. Know where the exits are and how to open them.

F. Move out in a rapid, orderly manner. Provide assistance to those injured.

1543 Emergency Procedures--In the event of an emergency landing due to engine or mechanical failure, the following steps should be taken by everyone on board to help make the landing as safe as possible and to minimize personal injury:

A. ***Front Seat and Rear-Facing Back Seat Occupants***

1. If possible, foreman should send a "may-day" on forest net giving helicopter number and location. Pilot should send "may-day" on air net.

2. Make sure seat belts and shoulder harness are secure.

3. Sit so your back rests against the back of the seat; do not slouch.

4. Remove glasses, if worn.

B. ***Rear Seat, Forward and Side-Facing Occupants***

1. Make sure seat belts and shoulder harness are secure..

2. Keep intercom traffic from the back seat to the front seat to a minimum.

3. Remove glasses, if worn.

C. ***All Personnel***--After crash:

1. If ship has landed in an unstable condition, do not leave ship until rotors have stopped.

2. If possible, before exiting ship:

   a. Manager should grab first aid kit.

   b. Designated crewmember should grab fire extinguisher.

   c. Designated crewmember should grab radio bag.

   d. Designated crewmember should grab the ELT.

3. Get clear of ship immediately.

4. Take head count and make sure everyone is out of the ship.

5. Rescue anyone who cannot leave ship alone. Administer first aid.

6. If you are on fire, roll on the ground to put fire out.

7. If radio is available, notify anyone that can be reached. Provide information on extent of damage, injuries, and location.

8. Remove any flight gear that may be soaked with fuel.

9. Make sure that emergency locator transmitter has been activated.

10. Non Fire mission PPE deviation will require prior approval from Aviation Manager or Safety Pilot.

1544 Protective Clothing and Equipment

A. ***Introduction***--The proper use and maintenance of equipment utilized in helicopter operations by ground and aircrew personnel is essential to safety. Since most of the equipment is expensive, proper maintenance is crucial.

B. ***Personal Protective Equipment (PPE)***--Personal protective equipment consists of clothing and equipment that provide protection to an individual in a hazardous environment. If any flight crew member refuses to wear the required PPE, the helicopter manager should terminate the flight and report the incident to the Aviation Safety/Training Officer (Refer to Table 1540-14).

1. **Fire and Low-Level Flights** - While on a fire status or while participating in low-level flights (continuous flight below 500 feet above the ground level), excluding takeoff and landing, all personnel shall wear personal protective equipment specified in this section at all times, except as noted. This includes helicopter pilots, helitack crews, and members of fire crews and volunteer firefighters transported by helicopter.

   a. Helmets. The U.S. Army SPH-4 or equivalent flight helmet shall be considered standard for the Department during fire and low level flight operations.

      1) Helmets/hardhats with chinstraps will be made available to each passenger or crewmember.
      2) Helmets shall be clean and free of defects. Clean with mild soap and water only.

2. **Clothing**

   a. Shirt and trousers or flight suits shall be made of polyamide material currently marketed as "NOMEX" or other approved fire resistant clothing. The shirtsleeves and trouser legs shall have sufficient length to allow overlap of the glove cuffs and boot tops. Shirt cuffs shall be worn down and fastened. When wearing two-piece suits, the shirt shall be tucked into the trousers. Flight suits shall be kept clean.

   b. Gloves shall be made of leather or approved fire-resistant material and shall be free of holes, tears, oils, and grease.

   c. Leather boots must be of sufficient height to cover the ankles and allow the legs of the flight suit or trousers to be fastened over them.

C. ***Other Personnel***--Personnel not subject to low-level flights are encouraged, but not required, to wear the personal protective equipment listed on the Personal Protective Equipment List (see chart on page 1540-8) while flying in helicopters above 500 feet AGL and landing at approved helispots.

D. ***Other Flights***--On those flights for other than fire-related activities it is recommended, although not mandatory, that all personnel should wear the protective equipment specified in this section. All personnel participating in low-level flights (below 500 feet) while riding in the front seat of a helicopter shall wear the SPH4/5 flight helmet.

E. ***Flight over Water***--All Department pilots will wear the personal flotation device provided to them by the Department any time that aircraft is beyond gliding distance from shore. (During all bucket operations reference IHOG)

F. ***All Flights***--Please refer to the chart concerning requirements for personal protective equipment.

G. ***Cold Weather Operations***--Coats, bib pants, overalls, etc., made of "NOMEX" and worn over the flight suit are recommended, but are not required, during cold weather flight activities. Outerwear garments made of natural fibers (cotton, wool, or wool/cotton blends) are acceptable substitutes. Undergarments which are not made of natural fibers are unacceptable. Footwear such as rubber boots are acceptable during cold weather operations.

H. ***Survival Equipment***--Survival kits are available for all natural resource missions. Survival kits will be maintained by the Aviation Safety/Training Officer and will be available for all cold weather operations.

I. ***First Aid Kits - Aircraft***--Each aircraft will have first aid kits installed that are sufficient for the number of personnel on board, and they will be readily accessible to the flight crew and passengers.

PERSONNEL PROTECTIVE EQUIPMENT REQUIREMENTS	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Flight Mission																		
Point-To-Point (One developed airport/heliport to another developed airport/heliport, parking lot, sports field or as approved by Chief Pilot or Safety Pilot				X														X
High-Level Reconnaissance (Land)	X			X	X	X			X									X
Low-Level Reconnaissance (Land)	X			X		X			X									
Over Water Beyond Gliding Distance From Shore												X						
Over Water – Extended													X					
Aerial Capture, Eradication And Tagging Of Animals	X			X			X		X								X	
Firefighter Transport To And From Fireline		X			X		X						X	X				
Helicopter Crew (Fire or Project) [1]	X			X		X			X									
Operations Where Individual Not Restrained by Seat Belt (Cargo Letdown, Cargo Free fall, Video, FLIR)	X			X		X			X								X	
Snow	X			X		X				X								
Rappel, Short Haul And Cargo Let Down	Requirements are contained in the applicable guide.																	
	Requirements same as for government employees, depending upon mission																	

KEY

1 - Nomex Flight Suit
2 - Nomex Shirt/Pants
3 - Non-Static Clothing
4 - Aviator Flight Helmet
5 – Hardhat
6 - Nomex Gloves
7–Leather Gloves
8–Rubber Gloves
9–Leather Boots
10–Rubber/Synthetic Boots
11–High-Visibility Vest
12–Personal Floatation Device
13–Raft & Kit
14–Eye Protection
15–Hearing Protection
16–Respirator/Dust Mask
17–Approved Restraint Harness
18–Head Set Optional Non-Fire Mission
19- PPE Optional for Passengers Non-Fire Mission

[1] Due to the extra protection afforded, Nomex flight suits and Nomex gloves should be worn whenever possible by exclusive-use helicopter crew (fire or project). There are situations however, where the individual's flight suit and/or gloves may not always be available, in which case Nomex shirt and pants and leather gloves may be substituted.

1545 **Aircraft Crash, Search and Rescue**--In order to be ready to render assistance in the event of an emergency, each area office, unit office, base heliport and heliport must have the plan issued by Air Operations. The plan should be posed in a prominent place, and each person on duty should be fully apprised of his or her responsibilities. For fire operations it is always the responsibility of the fire dispatch center to initiate the items in the DNRC Crash Search and Rescue Guide (See Annex C - DNRC Aircraft Crash, Search and Rescue Guide). For Non Fire Missions it is the responsibility of the Aviation Manager/Chief Pilot or the Safety Pilot to decide who will be responsible for the initiation. This will depend on the user agency and will require prior coordination with that agency.

A. ***Introduction***--Time is an extremely critical factor in responding to overdue, missing, or crashed aircraft. Personnel responsible for flight following cannot justify any delay in initiating emergency response procedures based on the possibility that a pilot or manager has forgotten to perform a check-in. Immediate positive action is necessary; the longer the delay in locating the overdue or missing aircraft, the less chance the occupants have to survive an accident.

The SAFECOM process will be the responsibility of the Chief of Fire and Aviation. The DNRC Safety Officer is required to collect the information and submit the SAFECOM.

The procedure to be followed in the event of an accident or incident is to report it to the Aviation Safety/Training Officer and Chief Pilot or the duty officer (use the pilot schedule to determine) by telephone immediately, also notify the DNRC Safety Officer and the Chief of Fire & Aviation. The Aviation Section Supervisor/Chief Pilot will dispatch a team of investigators from the Department. When verbal contact has been made, complete written information on FS 5700-14 or SAFECOM Annex F, The DNRC Safety Officer will ensure the information is placed into the system; use e-mail; fax or whatever method is available to ensure the correct information is presented to the DNRC Safety Officer in a timely manner.

All SAFECOMs will be reviewed by the Safety pilot and or Chief Pilot for technical accuracy prior to being submitted.

B. ***Emergency Response Preparedness Plan***

1. **Local Unit Responsibility** - Each local dispatch or other flight following office should have a copy of the DNRC Aircraft Crash Search and Rescue Guide (Annex C). Information in this plan should be pre-completed in the event of a mishap. (i.e., phone numbers, etc.)

   a. Purpose--The purpose of the guide is to establish standard emergency response procedures that the local line officers will

follow once an aircraft meets the criteria (overdue, missing, or crashed).

b. Applicability--The plan will be used in situations where an aircraft is considered overdue, missing, or crashed.

c. Contents--The guide is formatted so that the individual making the initial response to an emergency can easily reference the appropriate situation and then follow the checklist of actions to be taken for that situation.

d. Emergency Response Procedures--A MAYDAY call indicates that the pilot of an aircraft is experiencing an in-flight emergency. The dispatcher or radio operator must listen closely, since the pilot may be relaying location information essential to dispatch of rescue services. For this reason, a dispatcher must always be on duty at the radio during mission type flights. Helicopter personnel should also closely and continuously track the aircraft location so that an accurate location can be relayed in an emergency.

C. ***Aviation Accident and Incident Reporting***

1. **Incident, Hazard and Accident Reporting**

a. Definitions--These definitions supplement those found in the glossary. These may vary slightly among agencies, but are generally applicable to all agencies.

1) Aviation Hazard--An aviation hazard is any condition, act, or set of circumstances that compromise the safety of personnel engaged in aviation activities. These hazards may address, but are not limited to, such areas as:

a) Deviations from policies, procedures, regulations and instructions as contained in manuals, handbooks, directives and standard operating procedures, etc.
b) Hazardous materials handling and or transport.
c) Flight following.
d) Deviation from flight plan, planned operations, type of use.
e) Failure to use PPE in accordance with manual policy.
f) Inadequate training or failure to meet training requirements.
g) Failure to utilize load calculations and or manifest correctly.
h) Weather conditions.
i) Ground conditions.

j) Pilot procedures.
k) Fuel contamination.
l) Unsafe actions by pilot, aircrew, passengers, or support personnel.

2) Maintenance Deficiency—
A maintenance deficiency is a defect or failure causing mechanical difficulties encountered in aircraft operations not specifically identified as an incident or aviation hazard.

3) Aircraft Incident--An aircraft incident is an unplanned event that results in damage which is less than serious aircraft incident criteria, or injury that does not require medical attention. A situation involving an aircraft and or personnel which has the potential of resulting in an accident is also classified as an aircraft incident. Examples are:

a) Injury to Personnel--Injury requiring first aid.
b) Damage to Aircraft--Any damage less than significant (and less than accident criteria) when engines/rotors are turning and there is an intent to fly. When in doubt, respond to the occurrence as if it were an accident. The accident investigators will determine whether the occurrence was an accident or an incident.
c) Forced Landing--A landing necessitated by failure of engines, systems, or components which makes continued flight impossible, and which may or may not result in damage or injury.
d) Precautionary Landing--A landing necessitated by apparent impending failure of engines, systems, or components or incapacitation of the flight crew, which makes continued flight inadvisable.
e) Aircraft Ground Mishap--A mishap in which there is no intent to fly; however, the engines and rotors were turning and damage incurred requiring repair or replacement of rotors, propellers, tires, wheels, wing tips, flaps, etc., or an injury occurs requiring first aid.
f) Ground Damage to Aircraft--A mishap not specifically addressed as an incident above, where the aircraft or component incurs damage requiring repair or replacement before flight. Power plants and or rotors may or may not be in operation.
g) Near Mid-Air Collision--When airborne aircraft encroaches within 500 foot of another airborne aircraft, or a pilot or crewmember determines that a collision hazard existed between two or more aircraft.

h) Accident--An occurrence associated with the operation of an aircraft that takes place between the time any person boards the aircraft with the intention of flight and the time all such persons have disembarked and in which any person suffers serious injury or death or in which the aircraft receives substantial damage.

4) Responsibility and Requirements for Reporting--It is the responsibility of any individual who observes or who is involved in an aviation accident to report the occurrence immediately to the Air Operations Section Supervisor/Chief Pilot. It is the responsibility of any individual who is involved in an aircraft incident or hazard to report it to the DNRC Safety Officer and the Aviation Safety/Training Officer. The FS 5700-14 (Incident Report) will be sent to the DNRC Safety Officer and the Air Operations Section Supervisor/Chief Pilot as soon as possible. The DNRC Safety Officer will ensure the SAFECOM is entered into the system. All maintenance deficiencies will be reported to the Aviation Maintenance Director. Use of the Department crash search and rescue guide will help you to respond quickly and correctly in case of an emergency when time is critical. (See Annex F - Form FS 5700-14 Initial Report of Incident or Accident).

5) Responsibility for Action--The Department will respond with a team of investigators, as directed by the Air Operations Section Supervisor/Chief Pilot for all accidents and incidents. If a pilot has a safety of flight incident, that pilot will be grounded until a Department check airman releases pilot for flight. If an aircraft experiences a safety of flight malfunction, that aircraft will be grounded until the Aircraft Inspector or his designee releases aircraft for flight.

1546 Training

A. ***Training***--Each pilot must undergo both an initial and recurrent training program. See Annex B for a complete listing of training maneuvers and documentation for training folders.

1. **Initial Training** - As minimum, all new pilots will receive training in the following areas:

   a. Departmental operations and procedures.

   b. Organizational breakdown of the Department.

   c. Review of FAA rules and regulations.

   d. Briefing on all applicable waivers.

   e. Briefing on all Department aircraft including dual time and checkout (to be noted in logbook).

   f. Dual demonstration of all flying under the conditions of a waiver (to be noted in logbook).

   g. Safety and emergency procedures.

   h. Pilot maintenance/preflight/daily responsibility.

   i. Flight check to be given by the Chief Pilot or his designated check pilot on those tasks pertinent to the mission.

2. **Recurrent Training**:

   a. Annual Department training consisting of a review of:

      1) Aircraft Limitations.
      2) Emergency Procedures.
      3) Safety.
      4) Flight Physiology.
      5) Review of Waiver.
      6) Pilot maintenance/preflight/daily responsibility.

   b. Annual flight check by Chief Pilot or his designated check pilot on those tasks defined in DNRC's Aircrew Training Manual (Annex B) pertinent to the mission he or she has been assigned.

B. ***Pilot Certification Requirements*** for operating with external loads.

1. Any DNRC pilot engaging in external load operations must have been Qualified and Certified by a DNRC Check Airman. The DNRC pilot will then be issued a DNRC Qualification Card.

2. An annual flight check/review will be given to each pilot consisting of the following:

   a. Takeoffs and landings with loads.

   b. Demonstration of directional control while hovering with loads.

   c. Acceleration from a hover.

   d. Flight at operational airspeeds.

   e. Maneuvering of the external load into release position and its release, under probable flight operating conditions, by means of the quick-release controls installed in the helicopter.

C. ***Pilot Conduct***

Although low-level flight operations are routine and necessary for Departmental work, no unnecessary risk will be tolerated. Special-purpose privileges granted by the FAA will in no case be abused by unnecessary or irresponsible low level flight. Such abuses will be dealt with by immediate suspension of flight duties for the pilot involved.

Routine patrol flights and high-altitude scouting are generally performed at 1,000 feet or more above ground level. Low-altitude patrol flights, scouting, lead plane work, air tanker operations or similar activities are conducted so as to be clear of ground obstructions and personnel.

Any safety of flight incidents will result in immediate grounding of the pilot until released for flight duty by a Department check airman.

1550 AIRCRAFT MAINTENANCE

1551 Overview

The Department's Aircraft Inspector is responsible for the Department aircraft maintenance program. It is the Aircraft Inspector's responsibility to decide which maintenance regulations are applicable and to establish the standard where Federal Aviation Administration (FAA) compliance is either not applicable, inappropriate or otherwise unclear. The establishment of this manual clarifies the Department's aircraft maintenance operation and provides for continuity and professionalism in the program.

The Department operates its aircraft under two distinct categories: Public Use and FAA, Part 91. The Department is generally considered a public use operator and is therefore exempt from most FAA regulations, including maintenance regulations. Although the Department is technically exempt it has, in the interest of safety, chosen to meet or exceed the scope and intent of applicable FAA regulations regardless of which category a particular aircraft is being operated under.

The Department has both FAA-certificated and DNRC-certificated aircraft. FAA-certificated means that the aircraft is issued a Federal Aviation Administration (FAA) airworthiness certificate and a DNRC-certificated aircraft means that it has an airworthiness certificate issue by the DNRC.

1552 General Guidelines

Note: FAR part 91 stipulates what actions are required including flight rules, maintenance, inspections, and record keeping. FAR part 43 stipulates how those maintenance functions are to be accomplished.

Except as provided in section 1557 below, DNRC aircraft will be maintained as civil aircraft with standard category U.S. airworthiness certificates.

Maintenance is to be performed only by Vendors and personnel approved by the Aircraft Inspector.

All replacement and modification parts must meet the approved parts criteria in accordance with FAR part 21 subpart K.

All maintenance operations including inspections, preventive and routine maintenance, major repairs and alterations, and parts purchases must be authorized, coordinated and supervised by the Aircraft Inspector or his/her designee.

All maintenance operations shall be performed in accordance with the DNRC Aircraft Maintenance Quality Control Manual.

Persons authorized to perform maintenance, preventive maintenance; rebuilding and alterations will do so in accordance with FAR part 43.3.

Maintenance record keeping will be in accordance with FAR 91.417 and 91.421. Content, form and disposition of the records will be in accordance with the requirements of FAR part 43.

Refer to the appropriate sections herein for specific policies and requirements.

1553 Required Maintenance

All DNRC aircraft shall meet the maintenance and inspection requirements as stipulated in FAR part 91 subpart C and E and the additional requirements of this manual as follows:

A. Aircraft shall be inspected and repaired in accordance with FAR 91.405 and the appropriate inspection program contained herein. These inspection programs comply with the requirements of FAR 91.409.

B. Aircraft shall have discrepancies and inoperative equipment repaired or replaced as per FAR 91.405.

C. No aircraft will be operated in an unairworthy condition in accordance with FAR 91.7 and will have such conditions repaired before resuming normal operations. Authorization to fly the aircraft to a location where the repairs can be performed maybe granted by the Aircraft Inspector or his/her designee.

D. In accordance with FAR 91.403(c), no aircraft will be operated unless the mandatory replacement times, inspection items or related procedures are complied with.

E. The applicable Airworthiness Directives required by FAR part 39 shall be complied with.

F. In addition the specific maintenance and inspection requirements for each aircraft model, contained in the appropriate aircraft section of this manual, shall also be complied with.

1554 Responsibilities

General Responsibilities

A. The Department, as per FAR 91.403, is responsible for maintaining the aircraft in an airworthy condition, including compliance with part 39 of the

FAR's (AD notes). The Aircraft Inspector is the Department's designee for ensuring compliance with these rules.

B. Pilots and maintenance personnel shall notify the Aircraft Inspector of any discrepancies, planned maintenance and inspections.

C. No person will operate an aircraft in an un-airworthy condition (FAR 91.7).

D. Maintenance personnel and pilots will ensure that the maintenance and inspections required by FAR 91.405, and as required herein, are complied with.

E. Operation after maintenance, preventive maintenance, rebuilding or alteration shall be in accordance with FAR 91.407. Pilots and maintenance personnel will ensure the following are complied with:

1. The aircraft has been returned to service and the appropriate record entry has been made.

2. A maintenance test flight must be performed after any maintenance activity which could have appreciably altered the aircraft's flight characteristics or substantially affected its operation in flight.

Aircraft Inspector Responsibilities--It is the Aircraft Inspector's responsibility to manage all aircraft maintenance activities to include the following:

A. Research, establish and maintain the standards contained within the maintenance section of this manual.

B. Research and provide the means, training and guidance to comply with the maintenance section of this manual.

C. Establish and maintain an aircraft maintenance quality control program.

D. Select, establish and maintain an inspection program, as required by FAR 91.409, for each aircraft. Refer to the appropriate aircraft section herein.

E. Ensure maintenance operations comply with the requirements herein.

F. Establish, implement and maintain the DNRC certificated aircraft program.

G. Establish and approve vendors for maintenance and parts.

Maintenance Personnel Responsibilities -- It is the maintenance personnel responsibility to assist the Aircraft Inspector in accomplishing the requirements herein to include the following:

A. Perform the required inspections and repairs.

B. Maintenance functions shall be performed in accordance with the requirements listed herein and it's supporting documents.

Pilot Responsibilities -- It is the pilot's responsibility to assist the Aircraft Inspector in accomplishing the requirements herein to include the following:

A. Before the first flight of the day:

1. The airworthiness inspection or preflight will be performed and signed off, in accordance with the appropriate aircraft manual.

2. The flight log discrepancy list will be reviewed after any maintenance action and before the next flight. Ensure that maintenance personnel recorded a brief description of corrective action taken. A reference entry should include the date, tach time, corrective action, name and work order.

B. Keep the aircraft interior and exterior clean.

C. Perform an engine power check every ten hours of operation.

D. Notify maintenance personnel of needed inspections or repairs.

E. Notify the Aircraft Inspector immediately if the aircraft is deemed un-airworthy.

F. Enter aircraft flight data, discrepancies, power checks etc. in the aircraft's flight log (Annex G) discrepancy list. Entries shall be made in accordance with the instructions contained in the Daily Log.

G. The pilot in command is responsible for determining whether the aircraft is in condition for safe flight. The Aircraft Inspector or his/her designee should be contacted to assist in the determination.

1. Flight with a safety of flight discrepancy is prohibited unless authorized by the Aircraft Inspector. The Aircraft Inspector will be notified as soon as possible of any safety of flight discrepancies encountered during the operation of the aircraft. Repairs will be completed before conducting normal operations.

2. Except as provided in FAR part 91.213, no pilot will operate an aircraft with inoperative instruments or equipment.

a. Placards will be installed for any inoperative instruments or equipment allowed by FAR 91.213(d)(2).

H. Must perform maintenance functions in accordance with the requirements contained herein.

1555 Deleted

1556 FAA-Certificated Aircraft

Cessna Aircraft

1. Cessna model 180/182/185 shall be inspected and maintained in accordance with the general requirements of this manual and the following:

a. These aircraft have been issued a FAA Standard Category Airworthiness Certificate. Refer to the appropriate FAA Type Certificate Data Sheet for certification standards. The aircraft must conform to its Type Certificate at all times or be in a properly altered state.

b. Maintenance will be performed in accordance with the manufacturer's maintenance schedule, instructions and manuals.

c. These aircraft have been placed on the manufacturer's Progressive Care Inspection Program. Refer to the manufacturer's manual for the schedule and requirements.

d. The aircraft manufacturer's overhaul and retirement schedule will be complied with unless superseded by a FAA part 39 Airworthiness Directive.

e. The aircraft manufacturer's mandatory bulletins will be complied with.

f. Major repairs and alterations will be authorized, performed, approved and recorded as stipulated in this manual and FAR part 43.

g. The manufacturer's current flight manual will be used.

h. Discrepancies and inoperative equipment will be handled in accordance with the 1553 of this manual. The minimum equipment shall be as required by FAR 91.205 for VFR flight.

Bell Helicopter

1. Bell Helicopter model 206 will be inspected and maintained in accordance with the general requirements of this manual and the following:

   a. These aircraft have been issued a FAA Standard Category Airworthiness Certificate. Refer to the appropriate FAA Type Certificate Data Sheet for certification standards. The aircraft must conform to its Type Certificate at all times or be in a properly altered state.

   b. Maintenance will be performed in accordance with the manufacturer's maintenance schedule, instructions and manuals.

   c. These aircraft have been placed on the manufacturer's inspection program contained in the maintenance manual. Refer to the manufacturer's manual for the schedule and requirements.

   d. The aircraft manufacturer's overhaul and retirement schedule will be complied with unless superseded by a FAA part 39 Airworthiness Directive.

   e. The aircraft manufacturer's mandatory bulletins will be complied with.

   f. Major repairs and alterations will be authorized, performed, approved and recorded as stipulated in this manual and FAR part 43.

   g. The manufacturer's current flight manual will be used.

   h. Discrepancies and inoperative equipment will be handled in accordance with the 1553 of this manual. The minimum equipment shall be as required by FAR 91.205 VFR flight.

1557 DNRC-Certificated Aircraft

1. DNRC operates former US Army UH-1H helicopters as MT UH-1H. These aircraft are not FAA certificated. DNRC has unofficially assumed the Type Certificate holder responsibilities. As such, DNRC is responsible for the following:

   a. Establish and maintain the conformity standard for the MT UH-1H.

   b. Maintains the type certificate in support of the continued airworthiness of the aircraft to include:

      i) Establish maintenance and inspection standards.
      ii) Establishes overhaul and inspection intervals.

      iii) Establish airworthiness limitations.

      iv) Develop, issue and maintain appropriate documentation required to identify and correct unsafe conditions.

      v) Develop, issue and maintain other technical data as required.

   c. Identify and develop modifications to improve the aircraft's performance, service life and capabilities as follows:

      i) Develop and approve data.

      ii) Develop, issue and maintain appropriate technical data.

   d. Develop and implement procedures for the acceptance and oversight of the production of parts.

2. Bell Helicopter model UH-1H will be inspected and maintained in accordance with the general requirements of this manual and the following:

   a. The aircraft conforms to the DNRC MT UH-1H Type Certificate and must conform to the Type certificate at all times or be in a properly altered state.

   b. Maintenance will be performed in accordance with the DNRC MT UH-1H Type Certificate requirements.

   c. These aircraft have been placed on the DNRC MT UH-1H Progressive Inspection Program. This program meets the requirements of FAR 91.409 and has been reviewed and

accepted by the FAA. Refer to the manual for the schedule and requirements.

d. The overhaul and airworthiness limitations contained in the DNRC MT UH-1H Type Certificate shall be complied with.

e. All Alert Service Bulletins stipulated by the DNRC MT UH-1H Type Certificate shall be complied with.

f. Major repairs and alterations will be authorized, performed and approved as stipulated herein. Recording of work performed shall be in accordance with 1557 para 3.

g. The flight manual issued under DNRC MT UH-1H Type Certificate shall be utilized.

h. Discrepancies and inoperative equipment will be handled in accordance with the 1553 of this manual. The minimum equipment shall be as required by FAR 91.205 VFR flight.

3. Since the FAA maintenance regulations do not apply to the MT UH-1H, DNRC will perform maintenance on the MT UH-1H as follows:

a. Develop, implement and maintain an FAA Part 145 style Repair Station manual covering the maintenance functions for the MT UH-1H.

b. UH-1H maintenance shall be performed in accordance with the Repair Station Manual.

(Refer to Annex G -- Maintenance Forms)

1560 FLIGHT OPERATIONS

The objective of this section is to describe air operations, give guidelines and policies promoting a safe, efficient, and economical means of aircraft use in connection with natural resource protection.

Flight Performance--Flight performance shall be conducted according to FAA operation certificates, manuals and regulations; Montana State laws; and DNRC Policies. USFS Standards will be used when the aircraft is under USFS operational control. Only qualified personnel, approved by the Chief Pilot or his designee, the Safety/Training Officer, will operate aircraft for the purpose of DNRC activities.

Fuel--Only aviation grade fuel will be used in DNRC aircraft as per manufacturer's specifications. Fuel is purchased from vendors at normal airports as listed in the appropriate directories. The AVCard is a Multi Service fuel card which enables the aircraft to be refueled at non-contract fixed-base operators. 384M, 368M, 391M, AND 12B will be utilize the Multi Service card. Fuel vendors are as follows:

Billings	--	Edwards Air
Bozeman	--	Alrin's Aircraft Service
Butte	--	Butte Aviation
Helena	--	Exec-Air
Great Falls	--	Holman Aviation
Kalispell	--	Glacier Jet Center
Lewistown	--	Newton Aviation
Missoula	--	Northstar Aviation

Updates on locations can be obtained at: http:/www.airseacard.com/cgi-bin/fbo_locate

DNRC maintains five medium fuel tenders, one small fuel tender and one portable pickup fuel tender.

The Interagency Helicopter Operations Guide will be followed as per Chapter 13 (Fueling Operations), except for truck requirements. The Department may use a fuel tender with less than eight hours of fuel, if it is determined that a smaller fuel tender will accomplish the mission.

Night Flying--Extended flight operations at night in single-engine aircraft are considered dangerous and are discouraged. Although such flights are not prohibited outright, pilots are urged to conduct them only for reasons of utmost importance.

Instrument Flying--Single-engine instrument flying is a marginal operation and will not be a normal practice. Twin-engine aircraft, however, will be used for instrument flying. Actual instrument flying shall be governed by Federal Aviation Regulations, part 91 and/or 135. No instrument flights will be made into hazardous flying conditions, such as moderate or severe icing, thunderstorm, etc. Flights made into high-density air traffic will require a qualified co-pilot.

Landing Areas--An airport classification guide for Montana has been prepared to provide dispatchers and aircraft managers with a reference to determine the types of aircraft that are suitable to operate from specific airfields under normal conditions. This guide will be provided by the Montana Aeronautics Division. DNRC fixed-wing aircraft may land at unapproved sites (i.e., field and roads) if proper permission is obtained and the pilot is approved for such operations.

Prior to using any airfield, the aircraft managers and pilots should check the classification guide, latest state and federal publications, and NOTAM's to determine current status of the airfields, prior to use. Check weight restrictions on all airports to be used by heavy aircraft. Weather and runway conditions may limit or preclude the use of these airfields.

Out-of-state aircraft and pilots will not be scheduled into any remote or mountainous airfield unless they are familiar with the airfield and prior approval has been made with the Chief Pilot.

Flight Routes--Flight routes should be defined and planned to ensure a safe and efficient operation. For safety of flights, coordination is required with Flight Service facilities regarding type of operations, intensity, and duration. When possible, flights should be made on federal airways. Special-purpose flights (scouting, patrolling, spraying, etc.) should be planned to avoid controlled airspace, when possible. Patrol routes will be coordinated with all other fire protection agencies.

Congested Areas--Flights over congested areas, such as cities, towns, crowded freeways or highways, ranger stations and fire camps will be kept to a minimum. Heliports will be located to provide approaches and climb outs which will be clear of congested areas.

Communications--It will be the responsibility of each dispatching agency and Area Land Office (i.e., aircraft users) to inform Air Operations of any changes in communication frequencies. This information will be given to the Department Safety Officer.

Density Altitude Effects--High elevation, high temperature, and high moisture content, all of which contribute to high density altitude conditions, lessen performance. Performance is reduced because the thinner air at high density altitudes reduces blade or wing efficiency.

Winter Operations--Aircraft use for winter operations will comply with the following special equipment and operating procedure:

A. Sufficient equipment and personal clothing will be carried or worn to sustain personnel in a winter environment for at least 24 hours.

B. Aircraft must be equipped with adequate fully-operating cabin heaters.

C. Aircraft must have windshield defrosting capabilities.

D. A pilot can cancel flights in sub-zero temperatures if the personnel or aircraft are not adequately equipped for the flight or any en route emergencies.

E. Aircraft on overnight flights should be hangared in a heated hangar.

F. Aircraft used for winter operation will be properly winterized in accordance with its operational and maintenance manual.

Emergencies--When a pilot experiences an in-flight difficulty or emergency or believes a situation exists that would create an emergency, he/she will take any action he/she deems appropriate to assure the safety of flight. The pilot will report deviations from directives that may occur as a result of an emergency to his/her Chief Pilot or the Safety Pilot.

Flight Following Plans—Normal flight following will be accomplished with the AFF. Flight Following through Geographic Zone Dispatch Centers will be done for all fire mission flights (i.e., fire patrol, aerial survey, etc.). For normal point-to-point flying, a FAA flight plan will be filed.

Montana DNRC Air Operations performs many different and varied missions for other state agencies throughout the year. Because of this, the most advantageous Flight Following available for non-fire missions will be determined by the Aviation Manager/Chief Pilot or Safety Pilot.

Checklists--An adequate pre-flight checklist and a cockpit checklist, in accordance with FAR 135 (135.83), will be provided for all aircraft and will be used by all pilots for each flight. A visual pre-flight inspection will be made by the pilot before flight, and any deficiency which might affect the safety of the flight will be corrected prior to commencing that flight.

Seat Belts and Shoulder Harnesses--Pilots will assure that all occupants have fastened seat belts prior to takeoff and landings. Shoulder harnesses will be installed for each front seat occupant of helicopters. Shoulder harnesses are

recommended for crew positions in all DNRC aircraft. Where installed and operable, they will be used for all takeoffs and landings.

Passenger Handling

A. ***Manifesting***--Prior to every flight, the pilot-in-command will ensure a manifest is completed, to include a listing of all crewmembers and passengers on board. A copy of this manifest will remain at the point of departure, where practical. Unit and Land Office personnel will be required to be familiar with the manifest location, and educated on the MT DNRC Crash Search and Rescue Guide.

B. ***Briefing***--Before each takeoff and landing, the pilot-in-command or his designee will brief all passengers on the use of seat belts, smoking regulations and emergency exits. The crew will familiarize all passengers with the location and access to all survival equipment. On pressurized aircraft or non-pressurized aircraft flying above 12,000 feet, passengers will be acquainted with the oxygen source and usage requirements (FARs). For over water flights, special emphasis will be placed on ditching procedures briefing.

C. ***Debriefing***--All flights will be conducted in the most efficient, cost-effective manner possible. However, safety is paramount and will never be compromised. The pilot-in-command will lead a post flight debrief to determine if the aircrew thought the mission was performed efficiently and safely. A copy of the minute shall be kept in the Helicopter Manager's daily dairy.

D. ***Enplaning/Deplaning Passengers***

1. On single-engine fixed-wing aircraft (except float planes), the engine will not be started until all passengers are aboard and the doors are closed. At the completion of the flight, engine will be shut down, propeller stopped and switches off before cabin doors are opened for passenger off-loading.

2. In single engine floatplanes, if it is necessary for a passenger to assist the pilot in docking or beaching operations, he will be thoroughly briefed by the pilot on all safety precautions prior to each operation. At no time will a passenger or crewmember be allowed forward of the wing strut on a high wing aircraft or forward of the wing on a low wing aircraft while the propeller is turning.

3. On twin or multi-engine airplanes, passenger loading/off-loading may be accomplished at en route stops with engine(s) running on the side of the airplane opposite the cabin door. Pilots will carefully brief passengers on safety precautions prior to using this procedure. No personnel will be allowed on the side with the engines running. If access must be made to both sides of the airplane, all engines will be shut down.

4. Engines need not be shut down on helicopters during passenger unloading, providing the pilot briefs the passengers before they debark. Passengers must be directed to keep heads and equipment low, proceed away from the rear of the helicopter and not to leave the helicopter on the "uphill" side. If the rotors are turning, the passengers will be led toward the helicopter for loading by a qualified ground crew or flight crewmember.

1561 Hazardous Material

A. ***Hazardous Material Definition***--A substance or material which has been determined by the Secretary of Transportation to be capable of posing an unreasonable risk to health, safety and property when transported in commerce, and which has been so designated.

B. ***Policy***--The Department will use the guidelines set forth in the text entitled USDA - Forest Service Aviation Transport of Hazardous Materials Guide, NFES 1068.This publication will be used as a guide when it is necessary to carry hazardous materials.

C. ***Training***--All personnel involved with loading, unloading, packaging and handling hazardous materials must be trained. Training should consist of classification, marking, and labeling in accordance with CFR 48, Parts 171, 172, 173 and 175. Use NFES 1068 for guidance on proper handling of hazardous materials.

1562 Fixed-Wing Operations

Cargo Operations--No cargo shall be carried on or in any aircraft unless it is:

A. Secured in an approved cargo rack, bin or compartment installed on or in the aircraft.

B. Secured by an approved means.

C. Carried in accordance with each of the following:

1. Cargo is properly secured by a safety belt or other tie-down having sufficient strength to eliminate the possibility of shifting under all normally anticipated flight and ground conditions.

2. Cargo is packaged or covered to avoid possible injuries to occupants.

3. Cargo does not impose excessive loads on seats or floor of structure.

4. Cargo must not obstruct access to, or use of, any required emergency or regular exit, or the use of an aisle way.

5. Cargo must not be carried above occupied seats.

D. Loaded to allow physical entry for crewmembers to all parts of cargo compartments to extinguish any fire that may occur during flight.

Pilot-in-Command

A. The assigned pilot-in-command is directly responsible and is the final authority for the safe operation of that aircraft. In addition, the PIC has the authority to relocate the aircraft to facilitate proper rest or maintenance of the aircraft.

B. It is the responsibility of the pilot-in-command to be aware of and conform to DNRC policies, Federal Aviation Regulations, Bureau directives, and the regulations and directives of other applicable authority, including those relating to use for official purposes only and the transportation of unofficial passengers.

C. When two-pilot crews are used, the pilot-in-command for the mission will be specifically designated. The pilot-in-command will exercise command authority over all assigned crewmembers from the time of reporting for the flight until the mission is completed. The pilot is responsible for the safe and successful completion of the mission. He/she will delegate duties to other members of the crew. The pilot will also ensure that all passengers are dressed appropriately for the flight condition to be encountered.

D. At the completion of a flight, the pilot is responsible for adequate security and tie-down of the aircraft. Fueling will be done in accordance with the OAS "Aviation Fuel Handling" handbook.

Co-Pilots

A. The co-pilot is responsible to the pilot-in-command. When an assigned co-pilot is fully qualified in an aircraft, pilot duties (flying "left seat" on alternate legs, etc.) may be shared at the discretion of the pilot-in-command when passengers are carried. On a flight where no passengers are carried, pilots not fully qualified in the aircraft may occupy the left seat at the discretion of the pilot-in-command when the pilot-in-command is an OAS check pilot or holds current instructor's rating and full dual controls are available. A co-pilot will not assume pilot-in-command authority except in emergency situations due to incapacitation of the pilot.

B. Co-pilot time will not be logged unless there is a functioning set of dual or "throw-over" controls installed in the aircraft.

1563 Flight Limitations

Wind Restrictions--The capability of successful helicopter flights in extreme wind conditions is dependent upon the weight class of the helicopter being flown, as well as the pilot's experience with this type of flying. Helicopter operations will be shut down if the wind exceeds those limitations established in the operator's flight manual or manufacturer's recommendations. If no wind limitation has been prescribed by the manufacturer, helicopter operations will be terminated when wind speed exceeds the following conditions:

A. For low-level operations (below 500 feet): Small helicopters and single engine fixed-wing 30 knots, or a maximum gust spread of 15 knots; for medium/transport category helicopters 40 knots, or a maximum gust spread of 15 knots.

B. For cross-country flights (500 feet above ground level), 50-knot winds; not applicable for twin engine aircraft.

Snow Operations--Helicopter flights in falling snow may be accomplished, provided the following criteria are met.

A. VFR conditions can be maintained.

B. Turbine helicopters will be equipped with snow kits as prescribed by the approval flight manual. Helicopters requiring particle separators as part of their snow kit will be inspected for ice accumulation in accordance with the flight manual. Under conditions of wet, very large snowflakes, a visual inspection of the aircraft's particle separator will be conducted after ten minutes of flight. Should a buildup of snow be noted in either the snow kit or particle separator, further flight is prohibited. The aircraft's intake and exhaust covers will be installed during shutdown periods when the aircraft is subjected to falling or blowing snow.

C. Approaches must be made to landing without a planned hover. A maximum performance takeoff to clear an obstacle should be used to minimize blowing snow. Caution should be exercised to avoid whiteout conditions where a snow-covered surface cannot be detected due to the lack of the normal color contrast. This condition can be expected when the light is such that the surface is void of shadows and consists of unbroken snow. Whiteout can also be induced by rotorwash.

External Load Operations

A. External loads are defined as cargo protruding from the helicopter, cargo carried in external cargo racks, cargo carried on a jettison able sling, retardant bucket and fixed tank operation, and towing and stringing wire. Pilots must possess a current DNRC Pilot Qualification Card authorizing external load operations.

B. The pilot-in-command is responsible for ensuring that:

1. The weight capacity of the cargo hook is not exceeded.

2. The weight capacity of the cargo rack is not exceeded.

3. For jettisonable loads, the maximum allowable external load gross weight is not exceeded.

4. For non-jettisonable external loads, such as cargo on cargo racks, the internal gross weight limitation of the helicopter is not exceeded.

C. Passengers will not be carried aboard helicopters when dropping retardant, foam or water on fires.

D. With certain types of helicopters, such as the Bell 206B and 205A, an observer may be necessary to provide information to the pilot while dipping water from ponds or streams. In these instances, when a qualified observer is assisting the pilot in water dipping, the observer will not be allowed to remain in the helicopter during the dropping procedure, or the dipping procedure, but will observe from a safe distance.

Cold Weather Operations-- Planned or continuous operations into surface temperatures below -40 degrees will not be permitted, unless the aircraft is otherwise allowed by the approved flight manual.

Drugs and Alcohol--The basic directives of FAR, Part 91 apply.

Weight and Balance--Weight and balance information including passenger configuration, cargo distribution, center of gravity limits, maximum takeoff and landing weights, and charts for computing center of gravity location will be in the aircraft flight manual and/or weight and balance book for each aircraft operated by DNRC. Weight and balance will be completed and a copy will be left at the point of departure for every flight in transport aircraft with a maximum gross takeoff weight exceeding 12,500 pounds.

Personnel at Controls--Personnel on DNRC aircraft who do not hold a DNRC Qualification Card will not be allowed to manipulate the flight controls without prior DNRC approval.

Oxygen Requirement--The requirements in FAR 91 will apply.

Fuel Handling - Procedures--Detailed procedures for handling aviation fuel for DNRC aircraft are outlined in the Aviation Fuel Handling Handbook.

Airport and Heliport Facilities Management

A. ***Airport***--Each airport will be surveyed in order to establish their suitability for certain types of aircraft. The types of aircraft to be serviced at an airport or heliport facility will be determined by the length of runways, width of taxiways, strength of paving or other surface condition (aircraft footprint), parking room and turning clearances.

B. ***Management Guidelines***--The Air Operations Section will ensure that when operating airplanes out of operated airports or heliports that the following guidelines are used:

1. Safety guidelines are established and enforced.

2. Procedures for ground marshaling will be established. The Interagency Helicopter Training Guide may be used.

3. Equipment, such as power units, batter carts, maintenance stands, and fire extinguishers will be maintained and controlled.

4. Plans will be established for taxi and parking areas, the loading and unloading of personnel and cargo, and tie down areas.

5. Vehicular traffic controls will be posted and enforced.

6. Liaison procedures will be established for agencies using facilities.

Heliport

A. Heliport Construction and Closures

1. The "Heliport Installation Handbook" is used for the evaluation, design, construction, and closures of heliports. The Air Operations Section will determine guidelines.

2. Distribution of the handbook is made to DNRC aircraft managers and users by the OAS Headquarters Office, P.O. Box 15428, Boise Idaho 83715-9998 (see Field Reference Guide for Aviation Users). Revisions and amendments will be prepared for approval and issuance by the Director-OAS.
Link: https://www.iat.gov/docs/FRGAU_2013.pdf

Restricting Air Space over Forest Fires--When forest fire suppression activities require that air space congestion be minimized, aircraft not involved in the suppression activities may be temporarily restricted from the vicinity of the fire. Flight restrictions are provided by the Federal Aviation Agency (FAA) in the form of a TFR (Temporary Flight Restriction) when requested by fire personnel.

The NRCC is responsible for requesting a TFR through the flight service station at 1-800-WXB-RIEF (992-7433).

Flight Hazard Maps--Each area will maintain a ½-inch to the mile scale map showing flight hazards as accurately as possible, including those hazards in the approach or take-off patterns of heliports and helispots.

Use standard map legend in red for potentially dangerous transmission or telephone lines. Particular emphasis should be placed on wires and cables that cross drainages or draws. TV translators, microwave stations and other towers shall be indicated. Show special hazards with a red cross at the map location, connected to marginal descriptive data by red arrow. Omit natural hazards such as tall timber, peaks, rock bluffs, etc. Do not include buildings.

The map shall be reviewed and brought up to date annually and prior to initiating projects involving low-flight operation such as spray projects, mine surveys or water bucket operations. Hazard maps of the area involved shall be available at each air base and helitack base.

1564 Helicopter Operations

Helicopter Operations

A. The helicopter has become a familiar multi-use aircraft in resource management. In recent years, the Department has increased speed and payload by the use of better helicopters. To utilize this capability efficiently, we must realize that helicopters are potentially as dangerous as they are valuable. They are also expensive. They must be integrated within the Resource Management Organization and closely managed by trained personnel. Success of efficient helicopter use depends on trained and qualified personnel and key overhead that

have working knowledge of helicopter operations. It is essential that all aviation operations be planned with the utmost consideration given

to safety. Missions can be accomplished safely, provided that a high degree of preplanning, risk management and analysis is applied.

B. ***Objective***--The objective of this chapter is to provide specific operational procedures to providers and users of helicopter services. It will be used by specialists and technicians as a detailed outline in planning and carrying out helicopter operations. This handbook may be used for orientation and familiarization for personnel new to the helicopter program.

1. **Policy**

a. Rotary wing aircraft will be used in those functions contributing to more effective and economical operation. Helicopters are one of the single most versatile and flexible tools in natural resources work today. However, they are expensive, and careful planning for their use is essential.

b. Only fully qualified personnel meeting the list of qualifications outlined in Section 1520 will operate helicopters.

c. All direction in this handbook will be given for the purpose if ensuring safety and efficiency in helicopter operations.

d. Hot refueling is not permitted in DNRC aircraft.

C. ***Dispatch Procedures***--Dispatch procedures for fire operations: The helicopter manager will be responsible for receiving all mission-specific information from the dispatching agency. That information will then be relayed to the pilot. The pilot will be responsible for determining if the mission can be accomplished. The minimum information from dispatch will be a Lat – Long position, or geographic location and a Frequency with a ground contact if available at incident. The minimum crew for all Initial Attack Fire operations will be a Pilot and a qualified Helicopter Manager.

D. ***Aircraft Response Times***--The helicopter manager will be responsible for informing the pilot of the response time at the beginning of the duty day, and as to any changes that may occur throughout the day. The pilot will be responsible for adhering to the response time. At no time will safety be compromised so that a response time can be achieved.

E. ***Base Operations***--The helicopter manager shall be responsible for informing dispatch when the aircraft is in or out of service. Maintenance personnel shall inform the manager when the aircraft will be out of service due to maintenance. The responsibility for standby

orders shall lie with the dispatching agency. All base operations, to include equipment, shall follow the guidelines in the Interagency Helicopter Operations Guide.

F. ***Helicopter Landing Area Specifications***--The proper selection and construction of landing areas is essential to both the safety and efficiency of helicopter operations. Landing areas that are poorly constructed or located improperly may contribute to the cause of an accident. At a minimum, inadequate landing areas heighten risk, increase pilot workload and result in inefficient operations.

The Interagency Helicopter Operations Guide will be utilized for specific information in the construction of, dimensions of, and terminology of landing areas.

1. **Planning** - The most important aspect in planning for helicopter operations is the selection of areas on which to land the helicopter. The types of activity and volume of traffic will affect selection and development of these landing areas. The site should lend itself to expansion, which will accommodate the type of helicopter and volume of traffic expected. Planners should look well into the future to ensure that heliports will be adequate in location and size to meet future needs and will not become obsolete within a few years.

   If the heliport is to be on land that is not owned by the State government or on government land adjacent to private property, a careful study of the community's local laws, rules and regulations for the establishment of a heliport must be made. Site elections should be made to properly provide for takeoff and landing approaches which adequately clear both federal and private housing areas, schools, churches and any other community complexes which would be disturbed by low-flying helicopters. Landing areas should be located so that takeoffs and landings may be made into prevailing wind, if possible. Areas on exposed knobs and ridges could permit approaches and departures from all directions. When moderate-to-strong winds are common to a locality, it is important to choose landing sites that will be relatively free from air turbulence generated from large trees, buildings and terrain features in the vicinity.

G. ***Passenger Transportation***--The safety transport of passengers in helicopters is extremely important. Utilizing standard procedures for transport will ensure the safety of everyone involved in the operation.

1. **Passenger Brief** - All passengers will be briefed on the proper use of equipment for the particular aircraft they will be transported on. The safety briefing may be given by the pilot or as delegated by the pilot to qualified personnel. The briefing will follow the format of the safety briefing at the end of this chapter. The briefing shall be clear and must be understood. In-flight emergency procedures will also be briefed.

2. **Loading Procedures** - Personal gear may be carried on board, and passengers must maintain control of all personal items. Prior to approaching the helicopter, remove gear such as canteens that will impede fastening of the seat belt. Stay in a safe area until instructed by trained personnel as to the direction to go. Wear a flight helmet or hard hat with a chinstrap or carry it in hand. The first person into the helicopter passenger compartment should move to the center seat or seat assigned by the pilot or helicopter manager. Fasten and adjust seat belt. Ensure PPE is properly worn. Large gear will be stored in the cargo compartment.

3. **In-Flight Precautions** - No smoking during flight. Keep clear of the flight controls at all times. Keep control of gear and be aware of emergency exits. If in doubt, ask questions.

4. **Unloading Procedures** - Wait for pilot or other trained personnel to give okay to unload. Door should be opened by trained personnel or at the direction of the pilot when no one is available at the landing site. Remove seat belt and lay it back on the seat. If possible, refasten and lay on seat. Maintain tight control of personal gear and exit the helicopter slowly using the departure path indicated by the pilot or trained personnel. After leaving the helicopter, move to an area which is not in the flight path of the helicopter.

H. ***Aerial Photo***--Aerial photo missions for the helicopter will be flown in commensurate with all applicable FAR regulations and Department policies. No unnecessary risks will be taken during these missions.

I. ***Aerial Survey***--The helicopter is a good tool for viewing may Department functions from the air such as preliminary EIS requests, gravel operations, drilling inspections and many more. For these operations all the policies in this manual will provide guidance in safety of operations for these projects.

J. ***Fire Operation***

1. Helicopter initial attack is a normal function of the Department. Guidelines/safety procedures will be covered in DNRC's training program.

   a. External Load Operations - External load operations include water bucket operations and sling loads, using either normally configured leadline/swivel/cargo hook or the remote electric hook and long line. When planning an operation which will involve external loads, it is imperative that proper pre-mission planning be performed.

K. ***Flight Routes and Maps***--Flight routes and maps shall be discussed and briefed between the pilot and the user prior to departure on any flight.

L. ***Congested Areas***--Flights over congested areas, such as cities, towns, crowded freeways or highways, ranger stations and fire camps will be kept to a minimum. Heliports will be located to provide approaches and climb outs which will be clear of congested areas.

M. ***Helicopter Pilot Equipment***--Helicopter pilots involved in any DNRC fire activity shall wear, while in flight, leather boots, fire resistant clothing and an appropriate approved flight helmet. For those flights that are not fire-related but are considered to be in a hazardous flight regime, i.e., those flights conducted routinely in a low-level flight mode, pilots shall wear, as a minimum, an appropriate approved flight helmet. Deviation will require prior approval from the Chief Pilot or Safety Pilot.

1565 Helicopter Performance

Introduction--It is essential that non-pilot users of helicopters gain some working knowledge of helicopters' capabilities and limitations. This chapter will provide language and terminology concerning capabilities, performance and load calculations. Users are also encouraged to engage in conversations with the subject matter expert, the pilot.

Helicopter Performance and Selection--In order to safely and successfully complete the mission, the helicopter must be capable of meeting the performance required. Payload, hover ceiling, airspeed and fuel requirements need to be considered in selecting the proper aircraft. Other factors include the number of passenger seats, dimensions of the rotor disk, etc.

Load Calculations--The load calculation is the primary tool for determining if the helicopter is capable of lifting the load at a given temperature and

altitude. All load calculations shall be completed for all flights to ensure that the helicopter will perform within the limitations established by the helicopter manufacturer, without exceeding the gross weight for the environmental conditions where the helicopter will be used. When using military helicopters, a similar load calculation can be used such as the performance planning card.

All helicopters have a maximum computed gross weight limitation. These weight limitations are based on pressure altitude, air temperature, and configuration of the helicopter. Use the helicopter load calculation form 5700-17, RI 5700-17, or OAS-67. This form will ensure a margin of safety in helicopter loading while obtaining optimum use of the helicopter.

The pilot is responsible for the completion of the load calculation form. He will be responsible for completing items 1 through 13 of the form. The pilot must use the applicable performance charts from the helicopter operators flight manual and none other to complete his/her portion of the form. The helicopter manager must complete items 14 through 16. Retain completed load calculation forms with the project or flight records.

For repetitive flights, one calculation is valid between the same departure and destination base provided the original computed gross weights are not exceeded and the atmospheric conditions are approximately the same. Recalculate the load calculation when the pressure altitude changes + or - 5 degrees centigrade, + or - 1,000 ft. altitude, or any increase of the payload to be carried, including more than five gallons of fuel load (a decrease in fuel load will increase the allowable payload); a new load calculation form may be completed to reflect increased capability.

A. ***Determining Pressure Altitude***--Set aircraft altimeter kolsman window to 29.92 inches of mercury and then read pressure altitude directly off the altimeter, or altitude can be estimated by using a map, benchmarks, signs, etc. Temperature can be read directly off the outside air temperature gauge or for destinations by using the 2 degrees Celsius per 1,000 ft. or 3 degrees Fahrenheit method.

B. ***Determining Flight Crew Weight***--This is the weight of the pilot plus personal flight gear.

C. ***Determine Helicopter Equipped Weight***--The helicopter equipped weight is obtained from the aircraft weight and balance form in the aircraft flight manual.

D. ***Determine Fuel Weight***--The actual weight of a gallon of aircraft fuel may vary slightly. For computation purposes, the following weights should be used. If the pilot can determine the exact weight, he may use that weight.

AVGAS = 6.0 POUNDS PER GALLON
JET FUEL = 7.0 POUNDS PER GALLON

Utilizing the weight of fuel burned off en-route to the landing or hover site is an acceptable method of calculating a helicopter's ability to hover or land at the destination.

E. ***Operating Weight***--This is the sum of the helicopter's equipped weight, flight crew weight, and fuel weight.

F. ***Maximum Computed Gross Weight***--This weight is obtained from the appropriate performance charts (HIGE, HOGE) from the helicopter's flight manual.

G. ***Weight Reduction***--Except for external, jettisonable loads with pilot approval, the helicopter maximum computed gross weight for both HIGE and HOGE calculations shall be reduced by the weight listed in the weight reduction chart on the load calculation instructions.

H. ***Alternatives When Conditions Are Different***--Occasionally, the actual environmental conditions at the destination are more severe than that which was estimated for the load calculation, resulting in an over gross weight condition. Examples include higher temperature, higher altitude, or encountering a HOGE, instead of a HIGE landing site, etc. In these situations a different landing site at a lower elevation or an HOGE landing site can be selected, with a new load calculation completed to determine if the actual load is within the allowable load limits. For initial attack missions, this is the acceptable method of determining loads where the destination helispot is usually unknown.

The HOGE allowable weight may be utilized on a standard basis for internal loads when the destination is known to be, or has been designated, as a HOGE landing site, or when experience has proven that landing sites in certain areas are usually HOGE sites.

I. ***Manifests***--A listing of all passengers and cargo being transported is required. This listing of passengers and cargo may be accomplished on the load calculation form or the interagency helicopter passenger/cargo manifest.

Listing will include: full name of each passenger, employer information, weight of each passenger with personal gear, weight of additional cargo, and destination. A copy of the passenger manifest

must remain at the departure base. Base personnel must be educated on the purpose of the manifest and proper guidelines per the MT DNRC Crash Search and Rescue Guide.

J. ***Helicopter Loading***--Consideration of center of gravity limitations is important in the loading of all aircraft, but is particularly important in helicopters. In fixed-wing aircraft, the center of gravity is balanced over a horizontal wing area and has a comparatively wide range. In a helicopter, it is carried under a single point, like a pendulum; therefore, very little loading out of the center of gravity can greatly affect the controllability of the helicopter.

It is also important to properly secure all materials loaded on or in a helicopter. Careful attention must be given to small/heavy parcels loaded into helicopters to ensure that the pound per square inch maximum is not exceeded. Small heavy objects can punch holes in the flooring or collapse decking and the supporting stringers.

K. ***Standard Power Trend Checks***--Turbine engine power checks, when conducted on a regular basis, can be a good indicator of the health of the engine. Helicopter power checks will be conducted each 10 hours of flight time.

Each make and model helicopter may have a different power check procedure with different charts. Sample power checks with discussions of the elements involved are included for models most often used power check procedures are outlined in the individual aircraft flight manual.

Definitions and abbreviations:

1. EGT/TGT - Exhaust gas temperature/Turbine gas Temp.

2. HG - Inches of mercury.

3. ITT - Inter turbine or inter stage turbine temperature.

4. NF - Rotational speed of the power turbine in a free turbine engine. this speed may be expressed in percent. (N2)

5. NG - Rotational speed of the power turbine in a free turbine engine. (N1)

6. NR - Rotational speed of the main rotor.

7. NZ - Same as NF (sometimes referred to as N II).

9. OAT - Outside air temperature.

10. PA - Pressure altitude.

11. POWER - As used in this section, is the same as torque.

1566 Cargo Transport

Introduction--The safe, efficient transport of cargo utilizing helicopters is a high priority. If performed incorrectly, there is the potential for dropped external loads, spillage of hazardous materials in the helicopter, over gross weight condition, cargo interference with the rotor systems, and other serious safety hazards. Incorrect methods of rigging and transporting cargo can result in catastrophic accidents.

Use of procedures in this chapter will ensure the safe transportation of cargo.

Qualified Personnel

A. ***Ground Personnel***--Helicopter and helibase personnel must be trained and qualified to perform or supervise the transport of cargo. Trained personnel should be provided at all loading and unloading sites. Any exceptions to this requirement (for example, longline with remote hook) are noted in this chapter.

B. ***Pilot Qualification***--The pilot must be qualified for carriage of external loads and, if applicable, for longline with remote hook operation.

Load Calculations and Manifesting--During cargo transport operations, load calculations shall be performed prior to any flight activity. Weight of cargo is usually indicated on the load calculation form or if manifesting multiple trips, under one load calculation, on the manifest form.

Air Crew Member on Board During External Load Missions--An air crew member is allowed on board during external load operations for formal training when authorized by the Chief Pilot and or the Safety Pilot, and when the capability of the aircraft is not significantly reduced.

An air crew member is allowed on board during external load operations, when the safety of the fire mission can be substantially enhanced, and the capability of the aircraft is not significantly reduced. Mission examples are listed in the IHOG (page 10-2). This mission will require mutual agreement between pilot and manager. In addition, a thorough debriefing to the Chief Pilot, Safety pilot and Land Office Fire Manager must occur upon

completion of mission.
The pilot has final authority regarding carrying an aircrew member during external load operations, but must still obtain prior approval from the chief Pilot or Safety Pilot.

Hazardous Materials Transport and Handling--A complete list of hazardous materials is contained in CFR 172.11, Department of Transportation, Hazardous Materials Table. This guide will reference which materials can be transported via aircraft.

Cargo Preparation--Correct cargo preparation is essential to safe completion of the mission.

A. ***Pilot Approval***--Obtain pilot approval of all cargo to be transported. Loadmasters and other personnel loading cargo must always inform the pilot of:

1. Hazardous material(s) being transported.

2. Packaging of the hazardous material and its placement in the helicopter, which must comply with the requirements specified in the hazardous materials handbook.

B. ***Weighing***--Weigh cargo and inform the pilot of actual weights. Portable scales can easily be set up at remote helibases and helispots. Do not exceed allowable payload. If possible, have the cargo weighed, packaged, and marked prior to the arrival of the helicopter.

Equipment Inspection--Prior to the beginning of the operation, the helicopter manager or other person responsible for the cargo transport should inspect all equipment (i.e., lead lines, swivels, nets, tie-down straps, etc.) to ensure equipment is in good working condition and is being used properly.

Cargo Inspection--Prior to commencing operations, the helicopter manager or other person responsible for the transport should inspect all cargo. Inspection should include, as applicable, the following:

A. Liquid containers should be secured in an upright position.

B. Boxes should be taped shut and all items tied down or secured.

C. Cargo should be secured by restraining straps or nets constructed of synthetic webbing; straps or nets should be attached to cargo rings or attachment points specifically designed for restraining purposes.

D. Hazardous materials should be marked and the pilot made aware of items being transported.

E. Sharp edges of tools should be protected by tool guards or tape to protect the cargo net.

Loading Procedures--All internal cargo shall be properly stored and secured, regardless of whether passengers are being transported with cargo.

A. Soft packs may be carried by passengers in the passenger compartment of the helicopter. An initial attack pack is not considered a soft pack and must be secured in the cargo compartment or transported via sling.

External Cargo Rigging--The importance of inspecting equipment prior to rigging cannot be over-emphasized. Look and check for damage. If in doubt as to the equipment integrity, tag it as unusable or inoperable. On the tag, state the reason for the equipment being declared inoperable so that another individual will not use it.

A. The aerodynamic configuration of a load may cause it to spin or oscillate, which in turn may cause the pilot to experience control problems with the helicopter. The degree of the control problem may be small, easily handled by minor control inputs. On the other hand, the pilot may experience extreme difficulty in controlling the helicopter, usually caused by improperly rigged cargo coupled with winds and turbulence. The load may have to be re-rigged, or under extreme conditions, the pilot may be forced to release the load, either intentionally or inadvertently.

Cargo Rigging Techniques--The Interagency Helicopter Operations Guide shall be used to determine the proper method for rigging a specific type of cargo. While it does not cover every type of load that can be carried, it is an excellent reference for most load types.

Hookup Methods--There are four methods of hooking up loads to the helicopter for transport These are:

A. Hookup while the aircraft is on the ground.

B. Hover hookup, attaching the rigged load directly to the cargo hook (no lead line).

C. Hover hookup utilizing a lead line.

D. Hover hookup using a longline with a remote electric hook or carousel.

1. **Preparation for the Hookup** - Basic tasks that should be performed prior to any external load operation include:

   a. Prepare by removing any items from the helicopter that are

not essential.

b. If requested, remove any or all doors and store in a safe location as directed by the pilot.

c. Check both the rigging of the load and the external load equipment according to the requirements and guidelines previously discussed in this chapter.

d. Attach the load to a swivel (the swivel must have a rating equal to or greater than the load being carried, with an ultimate strength of three times the weight of the load). Use of a swivel is required in most cases. Always attach the swivel to the cargo hook or, if using the longline with remote electric hook configuration, to the remote electric hook.

2. **Hookup with Helicopter on the Ground** - This method is usually utilized with the helicopter shut down and involves the least amount of risk to those involved. It should be used when the considerations outlined for the other two methods do not apply.

   The pilot should be present when hooking the load to the aircraft. Once the load is ready, perform a three-point check:

   a. Pilot checks manual release on the cargo hook.

   b. Pilot checks the electric release on the cargo hook.

   c. Check the electrical function of the mission equipment (water bucket release, remote electric hook release, etc.).

   d. Run the lead line and swivel from the load to the cargo hook, ensuring that the line is not near or looped over any skid.

3. **Hover Hookup with No Lead line** - This method involves attaching the load (for example, a cargo net with swivel) directly to the cargo hook. This method of hookup without a lead line has disadvantages. There may not be enough slack in the net perimeter lines to allow the hookup person to attach the load to the cargo hook. In extreme cases, the helicopter may have to descend almost on top of the load itself. This procedure is not recommended unless there is enough line for the hookup person to stand almost upright below the helicopter.

4. **Hover Hookup with Lead line/Longline** - Hover hookups with lead line are effective:

   a. When multiple loads need to be transported in a short period of time.

   b. When the load destination involves terrain on which the helicopter is unable to land. To determine when and how to use a lead line/long line, consider:

      1) Pilot preference.
      2) Cargo to be transported.
      3) Terrain and surrounding vegetation at the takeoff point and destination.

5. **Hover Hookup with Long Line and Remote Electric Hook** - Hover hookups with longline and remote electric hook are effective:

   a. When multiple loads need to be transported in a short period of time, and when the load is on terrain on which the helicopter is unable to land or take off, and the surrounding vegetation is such that the helicopter is unable to perform a hover hookup with a standard length of lead line.

   b. When ground personnel are not at the site.

Required Personnel

A. ***Hookup with Helicopter on the Ground***--Only one person is necessary for this type of operation.

B. ***Hover Hookup***--It is recommended that two individuals perform this type of operation, one qualified person hooking up the load and one person maintaining communications.

   1. **Briefing** - A safety briefing should be completed prior to performing hover hookups.

   2. **Helicopter Hand Signals** - In the event radio communications are not sufficient, then standard hand signals shall be used.

C. ***Emergency Procedures***--Prior to hover hookup operations, emergency procedures should be discussed with the pilot and ground crew. The pilot should discuss procedures in the event of a mechanical failure and the steps that should be followed should a failure occur.

1. The pilot should indicate the intent will be to move the helicopter away from ground personnel, generally to the pilot's side of the helicopter, and the ground person should move in the opposite direction, or fall flat next to the load to attempt as much protection as possible.

2. **Radio Communications** - For operations where radio communications are recommended or required, ensure frequencies are established, radios checked and ground contacts identified. The pilot shall receive radio communications from only one person.

3. **Hover Hookup With or Without Lead line** - For hover hookup operations it is recommended that an additional person or hookup person maintain communications with the pilot.

4. **Hover Hookup with Long Line and Remote Electric Hook** - Radio communications between pilot and ground personnel must be established to ensure the safety of the person making the hookup.

Procedures for Hover Hookups

A. ***General***--There are standard procedures for any hover hookup, regardless of whether or not a leadline or a long line is used. These include:

1. The cargo load itself should be placed in front of the helicopter skids, with no potential for the lead lines to become snagged over the skids.

2. The cargo nets perimeter lines should be drawn over the top of the load and laid so that the lines and leadlines are prevented from becoming entangled in the net during takeoff.

3. Ground personnel should direct the pilot by radio or standard hand signals. Placement of loads carried by long line and remote electric hook may be done independently by the pilot if no ground personnel are available.

4. Ground personnel should be far enough back of the load to remain visible to the pilot at all times; personnel should establish this position by anticipating the length of the lead line or long line attached to the load or helicopter; the longer the line, the farther back from the load ground personnel should be.

5. This position should be slightly to the side of the load so that the ground personnel can maintain visual contact with the pilot from the pilot's position in the cockpit.

6. This ground person should wear a non-flammable, high-visibility vest to distinguish himself from other ground personnel.

7. Mutually agreeable measures to prevent static electric shock may be taken by the ground person making the hookup and the pilot.

8. When the hookup person is clear of the helicopter, ground personnel may signal the pilot to begin movement of the load.

9. Ground personnel must pay close attention as the helicopter lifts up and tension is applied to the line; an improperly rigged or placed loan can become snagged at any time.

10. Always keep the load between you and the helicopter.

B. ***Long Line with Remote Hook Procedures***--Considerations and requirements for long line with remote electrical hook operations include:

1. The sling load should be placed on the ground in the center of the loading area.

2. On approach, the signalman should advise the pilot on load clearance from trees, load height above the ground, and any problems that might arise in the pickup or drop zones.

3. For safety purposes, the hook should be landed next to the load. The hookup person should not be in the vicinity of the load at the time the pilot is placing the hook.

4. Once the hook is placed on the ground, the pilot should then move the helicopter to the side so the hookup person is not directly beneath the hovering helicopter.

5. When attaching a load to the remote electric hook, the hookup person should allow the hook to contact the ground before touching it. This will ground the hook and reduce the possibility of electric shock from static electricity.

6. The hookup person will hook the load and leave the area.

7. The helicopter is then positioned above the load and lifted from the ground and flown out.

8. When receiving a load, stay clear of the landing area. Let the pilot set the load on the ground and release it from the remote hook before entering the area.

Cargo Letdown--Cargo letdown is a system that allows controlled descent of lighter cargo loads from a hovering position into areas that are not conducive to delivery by the internal cargo method, or which do not contain equipment to make a normal external load delivery.

Cargo Free Fall--The free fall of cargo from a helicopter is an additional method of delivering cargo to an area where conventional methods will not work and a landing is impossible.

A. When cargo free fall may be used--free falling of cargo should only be done after these conditions are met:

1. The pilot and crewmembers have been trained in cargo free fall.

2. The helicopter cannot be landed safely, and the mission is essential.

3. Other methods have been considered, and free fall has been determined to be the optimal method.

4. A load calculation form has been completed for hover out of ground effect.

5. There is adequate clearance from obstructions in the flight path of the helicopter and the drop zone.

6. All flight crew members and ground personnel have been thoroughly briefed.

7. Positive air-to-ground communications have been established.

Drop Procedure--The following procedures must be followed:

A. Communications established.

B. Drop zone is identified.

C. Reconnaissance to determine if drop zone is feasible.

D. Ground personnel have been moved a safe distance from drop zone.

E. Determine wind condition and direction.

F. Determine ground and aerial hazards.

G. Establish flight path in and out of drop zone.

H. When over the drop zone, ensure prior conditions are met.

I. Drop cargo out and away from the aircraft.

J. Anticipate the forward airspeed of the aircraft

ANNEX LIST – 1500 MANUAL

Annex A	**DNRC Aircraft Use Management Guidelines**
Annex B	**Aircrew Training Manual**
Annex C	**DNRC Crash Search and Rescue Guide**
Annex D	**Pilot Supervision Matrix**
Annex E	**DNRC Aircraft Billing Form**
Annex F	**Form 5700 -14 Initial Report of Incident or Accident / Incident report**
Annex G	**Maintenance Form / Daily Log Instructions**
Annex H	**FAA Public/ Civil Aircraft Utilization Dispatch Worksheet**
Annex I	**Forest Service Approval Letter**
Annex J	**DNRC Guard Operations Guide**
Annex K	**DNRC Line Officer Aviation Transition Checklist**
Annex L	**Fuel Handling**

Reference	**IHOG**
Reference	**USFS Transport of Hazardous Materials**
Reference	**Public Law Advisory Circular 00-1.1A**