A Publication of the
National Wildfire
Coordinating Group

Interagency Helicopter Operations Guide

PMS 510 **February 2013**

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MEMORANDUM

To: Users of the Interagency Helicopter Operations Guide (IHOG)

From: Mark Bathrick, Director, Office of Aviation Services (OAS), DOI
Tom Harbour, Director, Fire & Aviation Management, Forest Service

Date: February 13, 2013

Re: Approval for publication of the 2013 IHOG

The Interagency Helicopter Operations Guide Unit (formally the IHOG Working Group) has revised the IHOG. The Interagency Helicopter Operations Subcommittee and the National Interagency Aviation Committee have endorsed this document and recommended it for approval. This document has also been vetted by the OAS and Forest Service aviation staffs.

This memo serves as the approval and authority to publish the submitted 2013 edition of the Interagency Helicopter Operations Guide.

The IHOG is a dynamic document and will be reviewed again in 2016. Please forward suggested changes for the 2016 revision to the appropriate agency representative from the Interagency Helicopter Operations Subcommittee.

A copy of this memo will be included in the front of the IHOG.

The Interagency Helicopter Operations Guide constitutes operational policy for those federal and state agencies who have formally adopted it as such. All changes contained in the new guide are effective as of February 2013.

Mark L. Bathrick
Director
Office of Aviation Services
U.S. Department of Interior

Tom Harbour
Director
Fire and Aviation Management
U.S. Forest Service

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CHAPTER 1: INTRODUCTION.

I. Objectives.

The objectives of the Interagency Helicopter Operations Guide (IHOG) are to:

- Promote safe, cost-efficient and effective aviation services in support of agency and interagency goals and objectives.
- Define and standardize national, interagency helicopter management and operational procedures for helicopter users from participating agencies.
- Through standardization, facilitate the ability of personnel from different agencies to work cooperatively on incidents or projects.
- Provide a framework within which areas, regions, states, and local units can provide supplemental, site-specific guidance.

II. Scope.

The procedures contained in this guide apply to helicopter operations conducted by providers and users of helicopters from participating agencies. This guide addresses both incident and resource/project helicopter operations.

For aviation operations using Active Duty/Reserve military helicopters, and National Guard units officially "federalized" by the Department of Defense (DOD), refer to Chapter 70 of the Military Use Handbook for specific policy and procedural information.

The use of National Guard units for federal firefighting purposes within their state must be outlined in national, regional, state or local agreements and Memorandums of Understanding (MOUs) between federal agencies and the specific National Guard units.

> IMPORTANT NOTE: The contractual relationship between the vendor and government is key to successful helicopter operations. There may be discrepancies between direction found in this guide and applicable helicopter contract language. When discrepancies arise, the current helicopter procurement document should be followed. However, if discrepancies cannot be resolved to the satisfaction of the vendor and government representative, the Contracting Officer should be consulted.

While it is recognized that field offices from most participating agencies have the authority to issue more restrictive guidance and directives than that contained in the IHOG, they are encouraged not to do so in the interests of the guide's objective to promote interagency standardization of helicopter operations. Exceptions to the IHOG may only be authorized through agency specific procedures.

IMPORTANT NOTE: If an agency chooses to incorporate the IHOG as policy within the agency's directives system, it is essential that the user understands the use of language in the IHOG regarding mandatory or optional compliance. The use of the verbs "must" and "shall" conveys mandatory compliance; use of "ought" and "should" conveys required compliance, except for documented justifiable reasons; and use of "may" and "can" conveys optional compliance.

III. Authority.

The aviation directives of participating agencies contain the authority to require implementation of this guide.

IV. Participating Agencies.

U.S. Department of Agriculture (USDA) – Forest Service (USFS)

Department of the Interior (DOI) – Office of Aviation Services (OAS)

DOI – Bureau of Indian Affairs (BIA)

DOI – Fish and Wildlife Service (FWS)

DOI – Bureau of Land Management (BLM)

DOI – National Park Service (NPS)

Participating State and Local agencies

A. Fire Operations

The IHOG is policy for all participating federal agencies for interagency fire operations.

The target group for distribution includes users and managers of helicopters, helibase management and air operations personnel, and other personnel involved in helicopter operations such as aviation managers, dispatchers and project managers.

B. Resource/Project Operations

The following agencies have adopted the IHOG for all helicopter operations.

- USFS
- BLM
- NPS

V. Organization.

The chapters of the guide are organized to assist the user in obtaining an understanding of standards and requirements for helicopter operations. The appendices provide the user with standard operational and administrative forms, checklists and other job aids.

VI. Publication.

Hard copies of the IHOG may be ordered. Ordering procedures and price are available in the National Fire Equipment System (NFES) Catalog Part 2: Publications posted at http://www.nwcg.gov.

VII. Review and Revision.

The Interagency helicopter Operations Guide Unit (Formerly the IHOG Working Group) has revised the IHOG. The IHOG Unit met to review and consolidate proposed revision to the IHOG that were generated from the field and from user agencies at all levels. The process allowed almost a full year for the field to propose changes. Each proposal was analyzed and either approved or rejected. Users are encouraged to recommend changes to this document through their aviation program manager or IHOG representative. The IHOG Unit was represented as follows:

- Carrie Vernon, NPS, Chair
- Bill Schuster, State, Vice Chair
- Patrick Kenny BLM
- Bob Quirino, USFS
- Todd Courture, BIA
- Dianne MacLean, FWS
- Michael Reid, OAS

The IHOpS Subcommittee reviewed and approved the revisions.

- Bryan Bitting, BLM, Chair
- Vince Welbaum, USFS, Vice Chair
- Dave Underwood, BIA
- Arlyn Miller, OAS
- Gary Morgan, USFS
- Glenn Cullingford, FWS
- Brad Koeckeritz, OAS
- Shad Sitz, NPS
- Dan Boyle, States

The Interagency Helicopter Operations Subcommittee and the National Interagency Aviation Committee have reviewed and endorsed this document.

The IHOG Unit will conduct a general review at least every three years. At that time, appropriate changes will be recommended to the Interagency Helicopter Operations Subcommittee (IHOpS).

It is recognized that interim revisions (those that occur within the three year revision cycle) may be necessary. Proposed revisions will be considered and, as appropriate, recommended to IHOpS. Interim revisions will then be issued under individual agency directive. Every effort will be made by the subcommittee to ensure that these revisions are issued in a timely and coordinated manner by participating agencies.

VIII. Ordering and Distribution.

The IHOG and the IHOG Supplemental Forms Package will be available for viewing and downloading at http://www.nwcg.gov

CHAPTER 2: PERSONNEL.

I. Introduction.

This chapter establishes common duties and responsibilities for individuals functioning in helicopter or helibase management positions. Position descriptions cover <u>both</u> incident and resource/project operations. Minimum staffing requirements for fire helicopters are also established.

II. Qualifications, Certification, Currency and Experience.

To meet minimum qualification standards, an individual must be trained, experienced, current and certified. Many types of helicopter and helibase management positions exist with incident and resource/project applications. Training, experience and currency requirements for various positions are found in a variety of documents.

A. Incident Helicopter and Helibase Management Positions.

Minimum qualification standards for individuals serving in helicopter and helibase management positions on wildland and prescribed fire are established by the National Wildfire Coordinating Group (NWCG) in the *Wildland and Prescribed Fire Qualification System Guide (*PMS 310-1). Each agency may require additional training, experience and currency standards of their employees, as long as they meet the PMS 310-1 minimum standards. Certification in these positions uses the Incident Qualifications and Certification System (IQCS) and is generally authorized by the local unit Fire Management Officer.

B. Resource/Project Helicopter Manager, Flight Manager and Crewmember Positions.

Training standards for resource/project helicopter manager, flight manager and crewmember include S-271, S-372 or applicable modules identified in the Interagency Aviation Training (IAT) Matrix found in OPM-04. Aviation users should refer to their bureau policy for resource position requirements.

C. Specialized Helicopter Positions.

Minimum position qualification standards for many specialized helicopter positions are established in various interagency guides and handbooks. Examples of these include the *Interagency Aerial Ignition Guide, Interagency Helicopter Rappel Guide, Helicopter Short-haul Guide, Aerial Capture Eradication and Tagging of Animals (ACETA) Handbook*, etc. State or regional aviation staff shall provide oversight and guidance.

III. Helicopter Management.

Chart 2-1 contains minimum staffing requirements for fire helicopters. It is recommended that

Exclusive-Use staffing for off-unit dispatch include the complete Exclusive-Use crew.[1]

Chart 2-1: Minimum Daily Staffing Requirements for Fire Helicopters

TYPE HELICOPTER	Federal Aviation Administration (FAA) STANDARD / TRANSPORT CATEGORY	FAA Standard Category Temporarily Designated for Limited Use	FAA Standard Category Permanently Designated for Limited Use* or FAA Restricted Category
1	Manager plus Four (4) Helicopter Crewmembers (HECM)	Manager only	Manager only
2	Manager plus Three (3) HECMs	Manager only	Manager only
3	Manager plus Two (2) HECMs	Manager only	Manager only
CWN Helicopter and Module should marry up away from incident(s) or fire operations. The minimum required staffing levels must be filled with fully qualified personnel. Trainees may be ordered in addition to the minimum module configuration.			

Limited Use Designation: This is an agency term used to denote a helicopter that can only be used in a limited role and not for passenger transport. Use would typically include external cargo transport or water/retardant dropping missions. This may be a temporary designation or it may be a permanent designation dictated by the contract or agency policy. During the period that a Type 1, Type 2, or Type 3 helicopter is temporarily designated as “limited use,” the assigned Helicopter Manager/Module are the only government employees authorized to function as aircrew and only when necessary (examples include ferry flights, initial attack size-up and bucket deployment or other non-external load missions).

The appropriate agency Aviation Manager at the state or regional level must grant approval any time a Standard Category helicopter is temporarily designated as “limited use” or re-designated to Standard Category. Any helicopter performing standard use missions requires full staffing of the module.

Two (2) Type I or Type II helicopters designated as “limited use” or FAA Restricted Category helicopters may be managed by one qualified Helicopter Manager only when the following conditions are met:

[1] Exclusive-Use crew members are used to fill critical helibase management positions.

- An order for another Helicopter Manager for the second helicopter has been placed and is actively trying to be filled.
- Both helicopters are working out of the same helibase and are physically located side-by-side.
- A Helibase Manager is assigned.
- The appropriate agency Aviation Manager at the state or regional level must grant approval on a case-by-case basis.

The management of two helicopters by one Helicopter Manager, as described above, should not be a standard operating procedure.

Standard Category Type III Helicopters may be temporarily designated and used as “limited use”, thus not requiring a standard module. A Helicopter Manager is all that is required. The following missions are authorized for Limited Use Type III Helicopters:

- ATGS- Air Tactical Group Supervisor
- HLCO-Helicopter Coordinator
- PSD- Plastic Sphere dispenser operations
- Infrared and aerial mapping
- Bucket Operations
- Cargo Operations
- Reconnaissance

The appropriate agency Aviation Manager at the state or regional level must grant approval on a case-by-case basis.

IMPORTANT NOTE: An Air Operations Branch Director or Air Support Group Supervisor may request delegated authority to approve “2 for 1” or “limited use” designation from the Regional or State Aviation Manager.

Limited Use Type III Helicopters <u>are not</u> included in the option of managing two helicopters with one Helicopter Manager.

- State and local agencies may have other minimum requirements for personnel and aircraft. Alaska agencies such as the Alaska Fire Service (AFS) have different staffing requirements when operating in Alaska. However, as a minimum, a Helicopter Manager must be ordered and assigned to all Exclusive-Use and Call-When-Needed (CWN) Helicopters in Alaska.

IV. Helicopter Management Personnel Roles and Responsibilities

A. Helicopter Manager.

The position of Helicopter Manager applies to the following:

- Exclusive-Use Contract Fire Helicopter Manager (including Helicopter Managers assigned to agency-owned aircraft)
- CWN Fire Helicopter Manager
- Exclusive-Use Contract Helicopter Flight Manager
- Resource Helicopter Manager

The duties and responsibilities of the Helicopter Manager.

1. Coordinate with scheduling office, Pilot, and users on flight planning (see Chapter 3), including, but not limited to:
    - Identify specific project requirements
    - Complete and review of Aircraft Flight Request/Schedule and, if special use, Hazard Analysis (this is applicable to project flights only. Fire missions are initiated on a Resource Order with job hazard analyses incorporated into operational procedures, helibase checklist and briefing formats, etc.)
    - Review of aircraft selection
    - Ensure that necessary equipment is available
    - Obtain required approvals and authorizations for the flight
2. Establish work schedule and coordinate with users and the scheduling office for use of helicopter.
3. Complete required administrative and operational forms specified in Appendix A and optional forms as required by local aviation management; complete required forms as outlined in Appendix B and optional forms as required by the Helibase Manager.
4. Verify that the aircraft and Pilot are approved and authorized for the type of operation to be conducted by checking Pilot Qualification Card and Aircraft Data Card.
5. Review vendor completed records and reports required by the procurement document (see Appendix A) including, but not limited to:
    - Vendor Service Truck Fuel Quality Control Log
    - Helicopter Power Check Turbine Engine and Helicopter Turbine Engine Performance Analysis Chart
    - Equipped weight as configured

- Helicopter Load Calculation
- Payment documents

6. Ensure required personal protective equipment is available and used correctly. See *Aviation Life Support Equipment (ALSE) Handbook*.
7. Perform preflight briefing and ensure a preflight passenger briefing by the Pilot is accomplished prior to the flight. See Chapter 10.
8. Ensure that flight following and resource tracking is performed; perform a preflight radio check. See Chapter 4.
9. Review and sign helicopter load calculations; complete, or delegate the completion of helicopter passenger/cargo manifests; may complete the Single Helicopter Load Capability Planning Summary - Multiple Helispots and Fuel Loads for planning purposes. See Chapter 7 and Appendix A.
10. Direct personnel in the conduct of helicopter operations (helispot location and construction, manifesting, loading and unloading of cargo and personnel, marshaling helicopters, rigging of external loads, etc.).
11. Ensure that, except in an emergency, there is no deviation from established flight plan or type of intended use unless such deviation is relayed and/or approved through identified procedures and that any requirements of such a deviation are met.
12. Assist the Pilot in aerial hazard identification; ensure a high-level reconnaissance is made prior to low-level flight.
13. Report any deviation from planned flight or normal operations immediately utilizing agency incident/hazard report.
14. Perform daily inventory checks and ensure that tool, equipment, and vehicle maintenance and refurbishment are performed; responsible for overall readiness of the helicopter crew. See Chapter 9.
15. Lead and participate in safety sessions and critiques; present safety topics to crew; maintain awareness of changes in aviation policy, regulations, and procedures; responsible for crew's and other users' welfare and safety in all aspects of job.
16. Complete Aircraft Fuel Facility Inspection Log at helicopter fueling facilities for which the government is responsible, or for those operated by the vendor but which are located on government land. See Chapter 13.
17. Monitor vendor personnel for compliance with flight time, driving time, and duty day limitations as contained in the procurement document; complete cumulative logs for vendor personnel as specified in Appendix A.
18. Ensure flight payment documents are accurate and submitted according to direction found in procurement document.
19. Function as the contracting officer's representative (COR) or Project Inspector (PI); monitor and ensure contract compliance by the vendor and vendor personnel utilizing the Aircraft Contract Daily Diary to document discrepancies; refer conflicts beyond immediate resolution to the COR if functioning as PI, or to the CO if functioning as COR. See Appendix A.

B. Helicopter Flight Manager.

Non-complex project missions need only be supervised by a Helicopter Flight Manager who has been trained and is qualified to conduct simple helicopter missions. Non-complex missions are defined as:

- Point-to-point transport of personnel from one developed heliport/helibase or airport to another developed heliport/helibase or airport
- Low and high-level reconnaissance
- Landings at or takeoffs from improved or unimproved sites with no extensive transport of groups of personnel or cargo from one site to another

Helicopter Flight Manager duties and responsibilities.

1. Coordinate with scheduling office, Pilot, and users on flight planning (see Chapter 3), including but not limited to:
    - Identify specific project requirements
    - Complete and review of Aircraft Flight Request/Schedule and, if special use, Hazard Analysis
    - Review of aircraft selection
    - Ensure that necessary equipment is available
    - Obtain required approvals and authorizations for the flight
2. Complete required administrative and operational forms specified in Appendix A and optional forms as required by local aviation management.
3. Ensure required personal protective equipment is available and used correctly. See *ALSE Handbook*.
4. Perform preflight briefing and ensures a preflight passenger briefing by the Pilot is accomplished prior to the flight; verification that the aircraft and Pilot are approved and authorized for the type operation to be conducted by checking Pilot Qualification Card and Aircraft Data Card. See Chapters 5 and 10.
5. Ensure that flight following and resource tracking is performed; perform a preflight radio check. See Chapter 4.
6. Ensure that load calculation and manifests are completed correctly. See Chapter 7 and Appendix A.
7. Ensure that, except in an emergency, there is no deviation from established flight plan or type of intended use unless such deviation is relayed and/or approved through identified procedures and that any requirements of such a deviation are met.
8. Assist the Pilot in aerial hazard identification; ensure a high-level reconnaissance is made prior to low-level flight.

9. Report any deviations from planned flight or normal operations immediately utilizing agency incident/hazard report.
10. When requested, assist Pilot in loading and unloading passengers and cargo.
11. Ensure flight payment documents are accurate and submitted according to direction found in procurement document.

C. Helicopter Crewmember (Fire and Resource Exclusive-Use or Call-When-Needed).

The HECM serves as a trained member of a helicopter crew, assisting the Helicopter Manager in the performance and completion of helicopter missions.

Duties and responsibilities of the HECM:

1. Constructs helispots, manifests, loads, and unloads cargo and personnel, marshals helicopters, rigs external loads, etc. See Chapters 8 and 10 and 11.
2. Assists Manager in performing daily inventory checks and in ensuring operational readiness of helicopter unit; performs tool, equipment, and vehicle maintenance and refurbishment; performs facility and cache maintenance. See Chapter 9.
3. Participates in proficiency checks and drills. See Appendix E.
4. Participates in safety sessions and critiques; provides preflight safety briefings to passengers; ensures own and others' safety and welfare in all aspects of job.
5. Completes aviation forms, vehicle reports, and requisitions as required.

V. Pilot Duties and Responsibilities.

The Pilot is an essential part of any aviation mission and must be made an integral part of a team effort whose objective is flight safety and efficiency. The Pilot is in command of the aircraft and has ultimate responsibility, under both FAA and agency regulations, for the safety of the aircraft and its occupants.

> IMPORTANT NOTE: The Pilot's decisions and judgment are final. No agency employee shall explicitly or implicitly ask or require a Pilot to perform any mission or flight maneuver which compromises flight safety.

Pilot duties and responsibilities.

- Adheres to Federal Aviation Regulations (FAR's), agency regulations (for agency Pilots), and the requirements of the procurement document (vendor Pilots).
- As applicable, coordinates with dispatcher, helicopter manager, and/or helibase manager on project or incident planning and logistics; reviews manifests and intended loads to ensure aircraft is capable of performing the mission; is responsible for knowledge of hazards in area of operations. See Chapter 3.
- Ensures that all aircraft and communications equipment is in good condition and operable; performs flight following as required by the agency. See Chapter 4.

- Carries a current Interagency Pilot Qualification Card; ensures the Aircraft Data Card is physically present in the aircraft; presents the card upon request (Exception: Military, Cooperator and Other-Government Agency aircraft may have non-carded aircraft and/or Pilots but a copy of the approving document must be available). See Chapter 5.
- Performs preflight aircraft checklist and preflight safety briefing of passengers, or delegates the briefing responsibility to qualified personnel. See Chapter 10.
- Completes Helicopter Load Calculation using applicable aircraft Flight Manual Performance Chart(s); ensures that payload does not exceed allowable payload. See Chapter 7.
- Meets contract requirements for fueling using approved static bonding procedures. See Chapter 13.
- Is responsible for the security of the aircraft.
- Except in an emergency, does not deviate from flight plan without relaying change to appropriate dispatch office or other flight following facility; does not descend below 500 feet above ground level (AGL) unless such flight has been authorized in advance or an in-flight deviation is approved; makes no descent below 500 feet AGL without first performing a high-level reconnaissance of the operations area to identify hazards. See Chapter 3.
- Wears personal protective equipment as required by agency directive (agency Pilots) or the procurement document (vendor Pilots).
- Completes flight payment documents per agency or procurement document direction.

IV. Helibase/Helispot Management.

Refer to the Glossary for definitions of helibase, helispot, and unimproved landing sites. Helibases and helispots must be staffed appropriate to the level of activity and complexity. Further information on specific requirements for helibase and helispot management can be found in Chapter 15, or in other appropriate chapter(s) of this guide.

Unless otherwise specified, the following job descriptions apply to <u>both incident and resource operations.</u>

Subject to the processes and procedures contained in this guide, the duties and responsibilities contained in the *Wildland Fire Incident Management Field Guide* have been expanded upon and incorporated into the following helibase organization job descriptions.

A. Helibase Manager (Type I or Type II).

The Helibase Manager has primary responsibility for managing all activities at the assigned helibase. Within the ICS system, the Helibase Manager is supervised by the Air Support Group Supervisor. On projects, the Helibase Manager may report to an Air Support Group Supervisor or Air Operations Branch Director if these positions are assigned. Otherwise, the Helibase Manager usually reports to the Project Aviation Manager.

Helibase Managers are qualified at two levels: Type I Helibase Manager, HEB1 (6 or more helicopters) and Type II Helibase Manager, HEB2 (5 or fewer helicopters).

IMPORTANT NOTE: The Helibase Management Incident Complexity Analysis is intended to assist a HEB2/ ASGS/AOBD/Aviation Manager, in assessing the current helibase operations and help in determining if a HEB1 should be ordered. This is a risk analysis tool that will help to quantify the complexity of an incident helibase operation and support a decision to request a HEB1 even if the number of assigned helicopters is five or less. This complexity analysis should be completed by the helibase/aviation manager and routed through their incident supervisor. See Appendix B.

Training, qualifications, currency, and experience requirements for this position are listed in PMS 310-1.

The Daily Helicopter Operations Briefing/Debriefing Checklist and the Helibase Manager's Reminders List are the <u>primary management tools of the Helibase Manager.</u> See Appendix F and H.

A complete review of all items on the Reminders List prior to the establishment of a helibase, and a daily or more frequent review of the List thereafter, will significantly enhance the safety and efficiency of helibase operations.

Most of the following duties and responsibilities will be fulfilled through completion of the Daily Checklist.

The duties and responsibilities of the Helibase Manager are as follows (refer to Appendix B for instructions on completion of referenced forms):

1. Obtain briefing from supervisor; obtain Incident Action or Project Aviation Safety Plan, including ICS Form 220, Air Operations Summary if available; plan helicopter missions accordingly; enter missions to the Helibase Mission Request Log.
2. Obtain a flight hazard map of the area of operations from supervisor or from the local unit; incorporate hazards into both the Helibase Facilities, Hazard, and Flight Route Map and the Incident or Project Map.
3. Check the status of any Temporary Flight Restriction (TFR) that has been planned or implemented by the local unit under FAR 91.137; request and implement restrictions if necessary; ensure air traffic control procedures are followed and that requirements for arriving and departing helicopters and procedures for deconfliction of airspace are in effect (see *Interagency Airspace Coordination Guide* for guidance and requirements).
4. Participate in helibase and helispot site selection, or, if already established, evaluate appropriateness of site(s); take necessary action in coordination with supervisor, including any relocation or adjustment; establish helibase facilities and layout. See Chapter 8.

5. Establish a helibase display board and a communications/operations area.
6. Participate in incident or project aviation planning activities; coordinate frequently with supervisor concerning priorities and conflicts.
7. Ensure that missions are accomplished effectively and according to tactical and logistical priorities; receive and respond to special requests for logistical or tactical support.
8. Submit personnel, aircraft, equipment, and supply needs to supervisor; establish an internal tracking system to track status and delivery of ordered resources. Provide for signing and security of helibase.
9. Manage special operations such as aerial ignition, retardant, seeding, or spraying, mixing, and loading operations.
10. Ensure load calculations, manifesting, and loading/unloading of personnel and cargo are performed correctly.
11. Provide for helicopter fueling and maintenance services and areas. See Chapter 13.
12. Ensure dust abatement measures are provided and used; if chemical means are used, ensure environmental concerns are addressed. See Chapter 8.
13. Establish crash rescue procedures and manage appropriate services for the helibase and helispots. See Chapter 12.
14. Establish flight following procedures utilizing the Helibase Flight Following Log. See Chapter 4.
15. Manage resources (personnel, equipment, supplies and aircraft) assigned to the helibase, to include:
    - Ensuring the safety and welfare of personnel, both agency and contract, assigned to the helibase
    - Assigning trained and qualified personnel utilizing the Helicopter Crew Information Sheet or other sources of information; ensuring each individual understands his/her responsibility and authority; Individual knowledge and skill levels vary, every effort should be made to assign the most capable person based on the complexity and nature of the assignment
    - Keeping an up-to-date record utilizing, as needed, the Helibase Aircraft Information Summary
    - Ensuring required personal protective equipment (PPE) is worn according to requirements. See Chapter 9
    - Meeting timekeeping, eating, sleeping, and transportation needs
    - Conducting briefings for helibase/helispot personnel and Pilots utilizing the Daily Helicopter Operations Briefing/Debriefing Checklist. See Appendix F.
    - Monitoring and managing operations utilizing the Helibase Manager's Reminders List. See Appendix H.

16. Maintain agency records and reports of helibase activities; complete required forms and checklists relating to helibase management as required and outlined in Appendix B; use optional forms outlined in Appendix B if necessary or as required by supervisor.
17. Ensure the completion and maintenance of agency records and reports of helicopter activities by ensuring that Helicopter Managers of assigned aircraft complete required helicopter management forms as outlined in Appendix A.
18. Conducts a debriefing at the end of each day's operation and obtains feedback on day's operations; takes timely corrective action concerning problems identified.
19. Completes performance evaluations of personnel and crews supervised.

B. Helispot Manager.

When assigned, HECMs manage helispots and are under the supervision of the Helibase Manager. When functioning as helispot managers, HECMs are responsible for providing safe and efficient management of all activities at the assigned helispot.

Since helispots are physically separate from the helibase, resulting in the inability of the Helibase Manager to oversee and monitor helispot operations, it is essential that the Helibase Manager assign experienced HECMs to supervise these helispots. Individual knowledge and skill levels vary, every effort should be made to assign the most capable person based on the complexity and nature of the assignment.

Prior to the start of operations, the Helibase Manager should extensively review helispot manager duties and responsibilities, as well as the load capability planning forms in Appendices A and B.

Management of the helispot involves the following duties and responsibilities:

1. Obtain briefing from Helibase Manager; obtain Incident Action or Project Aviation Safety Plan, including ICS Form 220, Air Operations Summary and Communications Plan, if available.
2. Ensure that qualified helicopter crew members are assigned to assist in helispot management, providing on-the-job training as necessary; conduct regular briefings with helispot crew; ensure all assigned personnel understand their responsibilities and authority; manage resources/supplies dispatched to helispot.
3. Obtain necessary equipment and supplies for the operation of the helispot (tools, fire extinguishers, wind indicators, etc.).
4. On incidents, ensure that all helispot personnel are capable of and prepared to perform fire suppression duties in and around the helispot; ensure that helispot crew is equipped to remain overnight, even in adverse weather conditions.
5. Obtain allowable payload information for the helispot for each assigned helicopter, utilizing forms outlined in Appendices A and B.

6. Obtain transportation and report to the assigned helispot; establish radio communications with the helibase; provide the Helibase Manager with initial or additional information for the Helispot Information Summary.

7. Ensure that all helispot personnel and personnel to be transported wear required personal protective equipment. See Chapter 9.

8. Ensure the helispot and landing pad is constructed and prepared properly to ensure safe use of the highest gross weight helicopter and/or helicopter with the largest diameter rotor blades; construct the helispot according to safety standards; if required, obtain approval prior to making improvements. See Chapter 8.

9. Install wind indicators and sign the area perimeter as necessary; perform any necessary aerial and ground hazard reduction and safety improvements[2] anticipate dust abatement needs and provide or request as necessary; make crash rescue equipment such as fire extinguishers available; number and map the helispot in coordination with the Helibase Manager.

10. Ensure helispot air traffic control procedures (safe flight patterns inbound and outbound) are in place; ensure that flight routes and area hazards are made known to all Pilots; ensure communications and parking tender(s) are in place.

11. Complete manifests accurately for all flights originating from assigned helispot; perform manifesting, briefing, and loading of personnel and cargo. See Chapters 7, 10 and 11.

12. Return external load equipment (nets, leadlines, swivels) and excess firefighting equipment to the helibase promptly.

13. Inform Helibase Manager of helispot activities; coordinate activities and requests for air support with the Helibase Manager.

14. If applicable, supervise or perform water or retardant loading at helispot.

15. Maintain records and reports of helicopter activities for later inclusion in the Helicopter Daily Use and Cost Summary. See Appendix A.

16. If returned to the helibase, attend the nightly debriefing and provide feedback on day's operations; otherwise, provide by radio.

C. Deck Coordinator.

The Deck Coordinator (DECK) is supervised by the Helibase Manager and is responsible for providing coordination at the helibase for personnel and cargo movement. The DECK supervises the Parking Tenders and Loadmasters.

The individual assigned must have a complete knowledge of helibase operations, and especially of helibase layout and setup, passenger and cargo transport, load calculations and manifesting, external load operations, fueling, and helibase air traffic coordination procedures.

[2] Environmental considerations may affect the construction of a helispot. However, at no time will aircraft or personnel safety be compromised. Significant helispot improvements such as the cutting of numerous trees should be cleared by the Helibase Manager with a higher-level authority (for example, the Air Operations Branch Director or Project Aviation Manager in consultation with the Resource Advisor).

NOTE: During highly complex helibase operations, the assignment of a fully-qualified Type I or II Helibase Manager to this position is strongly recommended.

The DECK's duties and responsibilities are as follows (refer to Chapter 15 and Appendix B for specific information on completion of referenced forms):

1. Obtain briefing from the Helibase Manager; obtain Incident Action or Project Aviation Safety Plan, including ICS Form 220, Air Operations Summary and Communications Plan, if available.
2. Provide input to and assist the Helibase Manager in completing the Helibase Facilities, Hazard, And Flight Route Map; review with all personnel involved, including Pilots.
3. Obtain sufficient trained and qualified personnel to manage the deck safely and efficiently; supervise personnel assigned to the deck, to include:
    - Ensuring the safety and welfare of personnel (both agency and contract) as- signed; ensuring all personnel understand their responsibility and authority; monitoring their actions to ensure duties and responsibilities are correctly performed
    - Conducting briefings of subordinates
    - Ensuring personal protective equipment is worn by both personnel assigned to the deck and by personnel being transported. Ssee Chapter 9.
    - Meeting timekeeping, eating, sleeping, and transportation needs
4. Assist the Helibase Manager in completing the Daily Helicopter Operations Briefing/ Debriefing Checklist by ensuring that all requirements of the Checklist for the deck are met prior to commencement of operations; review the parts of the Helibase Manager's Reminders List applicable to the deck. See Appendix F and H.
5. Establish, number, and mark touchdown pads and emergency landing areas. Ensure separation of landing areas for cargo, personnel, fueling and other specialized operations (e.g., retardant, helitorch, etc.).
6. Ensure the separation of ground vehicle traffic and parking areas from flight operations and overflight by departing or arriving helicopters.
7. Ensure deck access is restricted to personnel and vehicles by posting of warning signs, flagging, etc.; establish staging areas, ground traffic routes, and cargo and personnel manifesting and weighing areas utilizing flagging or other means.
8. Ensure crash rescue requirements are understood by deck personnel and that personnel are trained and qualified in the use of extinguishers, crash rescue, and evacuation kits; conduct on-the-job training sessions as necessary. See Chapter 12.
9. Ensure hand signals are mutually understood by Parking Tenders and Pilots; conduct on-the-job training sessions as necessary .
10. Anticipate dust abatement needs and provide or request as necessary.
11. Complete manifests accurately for all flights originating from assigned helispot; perform manifesting, briefing, and loading of personnel and cargo.

12. Ensure helicopter fueling is performed according to requirements and that Parking Tenders provide fire extinguisher protection during refueling.
13. Coordinate with the Takeoff and Landing Coordinator (TOLC) to ensure air traffic coordination; assumes the TOLC position if unassigned.
14. Maintain records required for the deck coordination function, including procedures for completing the Helicopter Daily Use and Cost Summary and the Helibase Daily Use and Cost Summary.
15. Coordinate frequently with the Helibase Manager; attend the nightly debriefing and provide feedback on problems encountered; recommend corrective action.
16. Completes performance evaluations of personnel supervised.

D. Parking Tender

The Parking Tender is supervised by the DECK and is responsible for ground and air traffic in and around the assigned landing pad and for the landing and parking of helicopters at that pad.

Parking Tenders should be fully briefed regarding responsibility for the landing pad to which each is assigned, as well as the helicopter(s) assigned to the pad. Parking tender should perform the bulk of their duties from outside the safety circle.

Aside from marshalling helicopters, duties include providing standby fire extinguisher service during refueling and the ability to respond quickly to an aircraft emergency. See Chapter 12 for crash rescue responsibility.

The use of push-to-talk headsets under the hard hat or flight helmet with portable radio adapter is strongly encouraged to facilitate monitoring TOLC and Radio Operator communications with inbound, outbound, holding, and parked helicopters.

> NOTE: Since the Pilot must be able to distinguish the parking tender from other ground personnel working on the deck, the use of non-flammable high-visibility vests is strongly recommended.

Parking Tender duties and responsibilities:

1. Obtain briefing from the DECK; obtain radio frequencies and other information necessary to perform the job.
2. Whenever the assigned helicopter’s engine is running, or whenever it is approaching or departing the parking spot, supervise activities at the assigned landing pad, including personnel, ground vehicle, and helicopter movement.
3. Know and understand crash rescue procedures; ensure that extinguishers are placed at the landing pad; be responsible for extinguisher operation in the event of fire either on landing, takeoff, or refueling.

4. Ensure touchdown pad is properly prepared, numbered, and maintained.
5. Ensure there is adequate communications between the pad, Pilot, DECK, and the TOLC.
6. Know and understand helicopter hand signals; provide wind advisories and other landing, takeoff, and holding directions to the Pilot; assist the Pilot as needed when the helicopter is departing, approaching, or is on the landing pad. Communication with the Pilot may be done either through hand signals or by way of radio communication. Positive communication over the radio by the Parking Tender via a patch cord and flight helmet is the preferred method. Parking Tender should be positioned outside the safety circle.
7. Be alert for potential conflicts between inbound and/or outbound aircraft.
8. Coordinate with loadmasters on the loading and unloading of personnel and cargo; ensure that loading personnel check personnel seat belts, cargo restraints, and helicopter doors prior to departing the area.
9. Monitor the fueling of helicopters; report any problems to the Helibase Manager.
10. Coordinate frequently with the DECK; attend the nightly debriefing and provide feedback on problems encountered; recommend corrective action.

E. Loadmaster (Personnel or Cargo)

The Loadmaster is supervised by the DECK and is responsible for the safe loading and unloading of personnel and/or cargo.

It is essential that all Loadmasters be briefed concerning the characteristics of each make/model helicopter assigned, as well as standard aircraft safety briefing procedures, personnel/cargo weighing, etc. Chapters 7, 9, 10, and 11 and Appendix A provide information on load calculations/manifesting and personnel/cargo transport requirements.

Loadmaster duties and responsibilities:

1. Obtain briefing from DECK; obtain radio frequencies and other information necessary to perform the job.
2. Ensure designation and signing of crew and cargo staging areas and of egress and ingress routes to the deck. See Chapter 8.
3. Obtain sufficient personnel resources to load personnel and cargo; supervise personnel assigned to loading positions, to include:
    - Ensuring the safety and welfare of personnel (both agency and contract) assigned; ensuring all personnel understand their responsibility and authority; monitoring their actions to ensure duties and responsibilities are correctly performed
    - Conducting briefings of subordinates

- Ensuring personal protective equipment is worn by both personnel assigned to the deck and by personnel being transported. See Chapter 9.
- Meeting timekeeping, eating, sleeping, and transportation needs

4. Supervise the manifesting of personnel and cargo according to requirements;
   - Ensure that appropriate hazardous materials regulations are enforced as outlined in the *Interagency Aviation Transport Of Hazardous Materials Handbook/Guide*
   - Ensure the Pilot is aware of weight and nature of all loads being transported
   - Supervise loading and unloading crews
   - Ensure all passengers receive preflight briefings
5. Ensure external load equipment is checked for proper operation before use.
6. Know and understand crash rescue procedures; inform personnel of helibase and helicopter crash rescue procedures.
7. Coordinate with TOLC and Parking Tenders.
8. Coordinate frequently with the DECK; attend the nightly debriefing and provide feedback on problems encountered; recommend corrective action.

F. Takeoff and Landing Coordinator.

The Takeoff and Landing Coordinator (TOLC) is supervised by the Helibase Manager and is responsible for providing coordination of arriving and departing helicopters and movement around the helibase. When this position is not filled, the DECK or Aircraft Base Radio Operator (ABRO) will usually assume this function.

The individual assigned must have a complete knowledge of helibase operations, and especially of communications, helibase layout and setup, and helibase air traffic coordination procedures.

During highly complex helibase operations, FAA Air Traffic Control personnel may act as TOLC. Consult the geographic area *Mobilization Guide* and the *Interagency Airspace Coordination Guide* for ordering guidelines and other considerations (i.e. timekeeping, equipment needs, etc). Their effectiveness can be enhanced by providing them with a reconnaissance flight of the incident or project.

This position is responsible for providing coordination of arriving and departing helicopters and all helicopter movement on and around the helibase. The TOLC's responsibility is to provide advisories on the safe takeoff and landing of helicopters. It is <u>not</u> to be a radio operator for general messages.

The TOLC works with the Helibase Manager and must be proficient in radio use and flight route planning. Prior to the start of a shift, review the Helibase Facilities, Hazard, and Flight

Route Map. Identify all landing pads and their letter or number identifiers. See Appendix B.

The TOLC needs to establish communications with deck personnel (Loadmasters and Parking Tenders) to inform them of incoming helicopters. This communication is often established on a Very High Frequency-Frequency Modulated (VHF-FM) or Ultra High Frequency-Frequency Modulated (UHF-FM) logistics frequency.

The TOLC's duties and responsibilities are as follows (refer to Chapter 15 and Appendix B for specific information on completion of referenced forms):

1. Obtain briefing from the Helibase Manager; obtain Incident Action or Project Aviation Safety Plan, including ICS Form 220, Air Operations Summary and Communications Plan, if available.
2. Assist in the completion of the Helibase Facilities, Hazard, and Flight Route Map; review with all personnel involved.
3. Coordinate with the ABRO on helicopter flight routes and patterns; establish air traffic control procedures with Pilots; ensure established flight routes and patterns in and out of the helibase are maintained; control movement of helicopters in hover lanes.
4. Establish and maintain discrete communications with all incoming and outgoing helicopters, usually on discrete Very High Frequency-Amplitude Modulated (VHF-AM) frequency(ies); maintain constant communications with the ABRO(s).
5. Coordinate with DECK and Parking Tenders on movement of aircraft when arriving at or departing from the Helibase; provide advisories (traffic, winds, etc.) to landing and departing helicopters.
6. Coordinate frequently with the DECK and the ABRO; attend the nightly debriefing and provide feedback on problems encountered; recommend corrective action.

G. Aircraft Base Radio Operator.

The ABRO is supervised by the Helibase Manager and is responsible for establishing and facilitating communications among incident or project assigned helicopters, helibases, helispots, air operations staff or Resource/Project Aviation Manager, and the TOLC. This individual is key to efficient communications, flight following, and mission assignment.

The ABRO should communicate frequently with the Helibase Manager concerning mission assignments, priorities, etc. The Helibase Manager should review the requirements of Form HBM-6, Helibase Mission Request Log and Form HBM-5, Flight Following Log with this individual prior to the start of operations.

After the morning briefing, the ABRO should review the Incident Action or Project Aviation Plan in depth. The ABRO should post ICS Form 205, Incident Radio Communication Plan, for quick reference. The position is instrumental in recommending and establishing a communication plan for the helibase.

Information from the Communication Plan should be transferred to the Helibase Organization Chart, which lists aircraft frequencies, and to the Air Operations Communications Plan.

ABRO duties and responsibilities (refer to Appendix B for specific information on completion of referenced forms):

1. Obtain briefing from Helibase Manager; obtain Incident Action or Project Aviation Safety Plan, or, at a minimum, ICS Form 220 Air Operations Summary, Communications Plan, Medical Unit Plan, and Incident or Project Map.
2. Receive orders for support or tactical missions, enter on the Helibase Mission Request Log, and assign these missions in consultation with the Helibase Manager. If conflicts among missions occur, the ABRO should inform the Helibase Manager who, if unable to resolve, will contact higher-level authority. ABRO must keep abreast of priority changes, helicopter missions, and incident objectives.
3. Notify TOLC of incoming aircraft.
4. If applicable, receive approval from Air Tactical Group Supervisor or HLCO before directing aircraft for takeoff.
5. Establish procedures for and maintain flight following with all assigned aircraft utilizing the Helibase Flight Following Log.
6. Establish and maintain proper radio procedures.
7. Obtain necessary timekeeping forms and record operational times of assigned helicopters; as needed, track available time (flight and duty day) remaining utilizing the Helibase Flight Time Tracking Record; record other information on the Helibase Aircraft Information Summary.
8. Obtain Helicopter Daily Use and Cost Summaries from Helicopter Managers and complete the Helibase Daily Use and Cost Summary prior to the end of each shift and submit to the Helibase Manager.
9. Understand crash rescue and medevac procedures and notifications; notify supervisor immediately of any overdue, missing, or crashed aircraft; institute emergency response procedures if necessary (refer to Helibase Emergency Response Plan and Incident Medical Plan ICS 206).
10. Coordinate with the Helibase Manager, DECK, and TOLC; attend the nightly debriefing and provide feedback on problems encountered; recommend corrective actions.

H. Mixmaster - Retardant.

The Mixmaster is supervised by the Helibase Manager and is responsible for preparing fire retardant for helicopters at the rate specified and for the expected duration.

> IMPORTANT NOTE: Retardant operations at helibases or other off-airport locations are conducted primarily by commercial vendors using Mobile Retardant Base (MRB) on emergency equipment rental agreements. Most of the Mixmaster duties outlined below are fulfilled by vendor personnel, with government involvement limited to contract administration and verification of payment documents. The duties below are provided as a guideline for what the Helibase Manager supervising an MRB operation may expect from the vendor, and the type of coordination that is required. Duties and responsibilities should be adjusted accordingly, given the vendor-government relationship.

If a portable retardant operation is ordered, it is advisable that the Helibase Manager immediately order a Mixmaster who is knowledgeable and trained in the type of portable retardant operation to be conducted.

Although it is recognized that many portable retardant operations come fully staffed by the vendor, it is advisable to order this position to function as the government representative monitoring retardant quality control, reviewing and approving payment documents, and generally overseeing the retardant operation.

Mixmaster duties and responsibilities:

1. Obtain briefing from Helibase Manager; obtain Incident Action or Project Aviation Safety Plan. If these are unavailable, a minimum of Air Operations Summary (ICS 220), Communications Plan, and Incident or Project Map.
2. Coordinate mixing and loading activities with the TOLC and DECK.
3. Determine needs and plan for necessary personnel, equipment, facilities, and supplies; ensure supply of retardant is adequate to meet demand.
4. Coordinate with the Helibase Manager or Helispot Manager to plan the retardant site layout and establish a retardant dip point and/or mixing area (this is usually performed in coordination with the retardant vendor).
5. Check accessory equipment such as valves, hoses, and storage tanks.
6. Supervise the mixing crew during setup and operations, to include:
    - Ensuring the safety and welfare of personnel (both agency and contract) as- signed; assigning qualified retardant mixers and loaders and ensuring all personnel understand their responsibility and authority; monitoring their actions to ensure duties and responsibilities are correctly performed
    - Ensuring required personal protective equipment is worn at all times. See Chapter 9.
    - Conducting briefings of subordinates
    - Meeting timekeeping, eating, sleeping, and transportation needs
7. Ensure that preflight inspections of drop equipment (fixed-tanks, buckets) are made prior to operation.

8. Coordinate with Helibase Manager to evaluate efficiency of the retardant operation:
    - Retardant mixture meets specifications
    - Cost-effectiveness of the operation, to include location of mix site relative to drop points and retardant effectiveness
    - Type of fill operation
9. Provide for proper storage and management of supplies and equipment; ensure that all environmental concerns and requirements are met; ensure that cleanup is performed prior to departure; a Resource Advisor should be able to help with local area concerns.
10. Keep required records for water, foam, and retardant use.

VII. Specialized Positions.

A. Helicopter Aerial Ignition Positions.

See *Interagency Aerial Ignition Guide* for additional information.

B. Helicopter Rappel and Short-Haul Positions.

See Interagency *Helicopter Rappel Guide* and *Helicopter Short-Haul Handbook* for duties, responsibilities, certification, training, and currency requirements.

C. Law Enforcement Helicopter Positions.

Sensitive mission requirements and objectives may require security clearances of personnel participating in the mission. Any individual deemed not suitable for the mission by the Law Enforcement Officer (LEO) shall be removed from the operation and documentation of the action taken shall be submitted to the unit Aviation Manager. See Chapter 16.

1. All law enforcement aviation operations using helicopters shall, depending on the mission profile, be conducted either by a qualified Resource or Fire Helicopter Manager or by a Helicopter Flight Manager.

   It is recommended that qualified LEOs fill the Helicopter Manager position.

   The one exception to personnel being required to fulfill the above requirements is when the agency is using other-government agency or military aircraft, <u>and</u> the provider of the aircraft is also providing all helicopter and/or helibase management services (for example, flight following, loading/unloading of personnel and/or cargo, external load operations, etc.).

2. Helicopter Crewmember. Any law enforcement personnel participating as a HECM and not solely as a passenger being transported shall meet the requirements for a Resource/Project HECM.

3. All law enforcement personnel filling helibase positions shall meet requirements.

4. Law Enforcement Pilots. Section V of this chapter outlines standard Pilot duties and responsibilities. Pilots from other law enforcement agencies, the National Guard, or Department of Defense shall be either approved through a Memorandum of Understanding or similar agreement, or shall possess a current Interagency Pilot Qualification Card.

   Sensitive mission requirements may require security clearances of the Pilot and/or vendor to ensure mission integrity. Law Enforcement Helicopter Managers are responsible for informing the scheduling unit of any such requirements.

D. Search and Rescue Helicopter and Helibase Positions.

Refer to Chapter 17 for operational procedures. Helicopter Managers and Crewmembers performing search and rescue missions shall meet resource/project requirements for helicopter or helibase management, as well as associated duties and responsibilities for each position filled.

E. Helicopter Coordinator.

The HLCO is supervised by the Air Tactical Group Supervisor and is responsible for coordinating tactical or logistical helicopter missions(s) at the incident.

The HLCO's duties and responsibilities are as follows:

1. Obtain briefing from Air Tactical Group Supervisor.
2. Survey assigned incident area to determine situation, aircraft hazards, and other potential problems.
3. Coordinate with Air Support Group Supervisor and/or Helibase Manager in establishing locations and takeoff and landing patterns for helibase(s) and helispot(s).
4. Coordinate the use of assigned ground-to-air and air-to-air communications frequencies with the Air Tactical Group Supervisor.
5. Ensure that all assigned helicopter Pilots know appropriate operating frequencies.
6. Coordinate geographical areas for helicopter operations with Air Tactical Group Supervisor and make assignments.
7. Inform Air Tactical Group Supervisor when mission is completed and reassign helicopter as directed.
8. Report incidents or accidents to Air Tactical Group Supervisor immediately.
9. Maintain record of activities.
10. Attend a debriefing and provide feedback to both the Air Tactical Group Supervisor, Air Support Group Supervisor, and Helibase Manager.

F. Military Helicopter Management.

For aviation operations using Active Duty/Reserve Military helicopters and National Guard units officially “federalized” by Department of Defense, refer to Chapter 70 of the *Military Use Handbook* for specific policy and procedural information.

The use of National Guard units for federal firefighting purposes within their state must be outlined in national, regional, state or local agreements and Memorandums of Understanding (MOUs).

G. Aerial Capture, Eradication, and Tagging Of Animals Helicopter Positions.

Vendors who provide gunners and muggers for ACETA operations are not required to adhere to the agency personnel requirements outlined below.

1. The Helicopter Manager of an ACETA operation shall meet the requirements for a Resource Helicopter Manager. The Helicopter Manager participating in ACETA operations has mission specific duties and responsibilities as follows:
    - Ensures that Pilot and aircraft are carded and certified for ACETA operations
    - Ensures dual controls are removed prior to commencement of the ACETA operation
    - Ensures crew and passengers wear PPE as specified in the *ALSE Handbook*, as well as in agency specific manuals and handbooks
    - Ensures all cargo is restrained according to requirements
2. The Gunner of an ACETA operation shall:
    - Operate appropriate weapon(s); ensures the weapon is not loaded or cocked unless the muzzle is outside and pointed away from the aircraft
    - Identify the animals(s) to target
    - Ensure adequate covering for protection of control mechanism and under seat area to prevent ejected shells, etc., from interfering with controls
3. The HECM participating on an ACETA operation as a mugger shall meet the requirements for a Resource/Project HECM.
4. All agency personnel filling helibase positions on an ACETA project shall meet position requirements.
5. ACETA Pilots must be carded for the ACETA mission and specific animals targeted. If single-skid, step-out, or toe-in landings are to be performed, Single skid Toe in Exit Procedures (STEP) training is required as well as an approved exemption granted by the appropriate agency aviation manager.

CHAPTER 3: OPERATIONAL PLANNING.

I. Introduction.[1]

It is essential that all aviation operations be planned with the utmost consideration given to safety and operational efficiency. Missions can be accomplished safely and efficiently, provided that a high degree of planning, risk analysis and management is applied. Many users have developed Standard Operating Procedures (SOPs) that streamline the planning process, incorporate the lessons learned from experience, and use the best practices that balance the demands for safety and efficiency.

This chapter discusses operational areas that must be addressed and actions that must be performed during the flight planning and scheduling process including, but not limited to:

- Assessment and mitigation of hazards
- Selection of aircraft
- Cost analysis
- Submission of the Aircraft Flight Request/Schedule
- Scheduling of aircraft with vendors
- Ensuring that sufficient qualified personnel are assigned
- Pilot and aircraft approvals
- Pre-flight briefings
- Post-flight evaluations

II. Planning.

Every decision you make will be affected by the objectives that are the basis of your mission, and your ability to anticipate and influence events before they occur.

To be effective, objectives must be clear. Simple objectives are usually better, but to be effective they need to be the following:

- Measurable on some quantifiable scale so you can ultimately determine whether the mission was successful.
- Achievable. This doesn't mean it has to be easy. If you're going to mobilize resources, nothing degrades their abilities, motivation, energy or enthusiasm quicker than to give them an impossible task.
- Supportive of the overall goals of the organization.

[1] Adapted from http://www.afterburnerseminars.com/the-six-steps-to-mission-planning.php and http://www.uscg.mil/auxiliary/training/tct/default.asp.

Preparation is the key to flexibility. You always need to have options. Long term success won't come if you continually rely on only one course of action. Ask "What if?" questions such as, "What if the flight is delayed? What if the passengers at an intermediate point are late? What if the meals for the spike crews aren't delivered as scheduled?" Up to fifty percent of your planning process is usually required for contingency planning.

It is easier to do contingency planning in an air-conditioned room in the company of your teammates instead of later when the rotors are turning and the sun is getting close to the horizon. That's not the time to brainstorm, but the time to execute based on decisions made in the calm comforts of the planning room. You won't have time to think things through as thoroughly during the mission. The answers to these questions need to be made in the planning stage.

Contingency planning needs to be detailed. Break down your mission into its smallest components and then rank those components on the basis of their importance. What's going to absolutely stop your progress? What component is essential for the mission to go on? Then work out all the ways something can go wrong to that component and develop your solutions.

At times you will come up with a very difficult situation that won't have an apparent answer. When this occurs there is a blockage caused by the operational tempo, resources selected, organizational culture, personal priorities, etc. Seek out the underlying cause for the impediment. The process of repeatedly asking the "Why?" of the issue will lead you to options you can explore more fully and get around the mental block. Keep peeling back the layers until the block is removed. Once you've got a back-up for every item on the must-have list, you're ready to execute your mission.

III. Risk Management.[2]

Risk management enables personnel at all levels to do exactly what the term implies: manage risks. Risk Management has been defined as the process by which risk assessment results are integrated with political, social, economic and engineering considerations for decisions about the need/methods for risk reduction. This section is directed toward risk management as it applies to helicopter and helibase field operations.

Any flight mission has a degree of risk which varies from 0% risk (no flight activity is conducted) to 100% (aircraft and/or personnel experience a mishap).

RISK CONTINUUM

0% |------------------------|--------------------------| --------------------- |--------------------------- | 100%
(NO FLIGHT ACTIVITY) (MISHAP OCCURS)

[2] Parts of this section are paraphrased from Flightfax - Report Of Army Aircraft Accidents, "Risk Management vs. Risk Assessment: What's The Difference," LTC. Kurt Pierce, December, 1991, Volume 20, No. 2

Flight operations are usually well organized and funded, making them one of the safest means of accomplishing work. Alternative methods, such as performing the mission by ground, should always be considered. In every mission there are many decision points such as:

- Planning decisions made in preparation for the mission and planned threat mitigations.
- Management approval for the mission to take place and the controls that management deems necessary to ensure a level of safety commensurate with the benefit of the operation.
- Continual decision making that is necessary to evaluate and respond to changing conditions during the execution of every flight.
- In accordance with Federal Aviation Regulations, the Pilot always retains final authority for the operation when safety of the aircraft and occupants is a factor.

Risk management is an ongoing process that should be integrated into all of these decision making processes.

A. Risk Management Principles.

These basic decision making principles must be applied before any anticipated job, task, or mission is performed:

- Accept no unnecessary risk. Unnecessary risk does not contribute to the safe accomplishment of a task or mission. The most logical choices for accomplishing a mission are those that meet all the mission requirements while exposing personnel and resources to the lowest possible risk.
- Make risk decisions at the appropriate level. Making risk decisions at the appropriate level establishes clear accountability. Those accountable for the success or failure of a mission must be included in the risk decision process. Supervisors at all levels must ensure subordinates know how much risk they can accept and when they must elevate the decision to a higher level.
- Accept risk when benefit outweighs cost .Weighing risks against opportunities and benefits helps to maximize unit capability. Even high-risk endeavors may be undertaken when there is clear knowledge that the sum of the benefits exceeds the sum of the costs.
- Integrate risk management into planning and execution at all levels. To effectively apply risk management, leaders at all levels must dedicate time and resources to incorporate risk management principles into the planning and execution phases of all operations. Integrating risk management into planning as early as possible provides the decision maker with the greatest opportunity to apply risk management principles.

B. Time Element in Risk Management.

Performing risk management is limited by the amount of time available for planning and requires flexibility and judgment by both Pilots and air operations supervisors. Risk management can be divided into three categories according to time element.

1. Time Critical. This type of risk management is an “on-the-run” mental or verbal review of the situation using the risk management process without necessarily recording the information. The process is used to consider risk while making decisions in a time limited situation. Many of the skills used in this context are applicable to normal mission where deliberate risk management has occurred and crews must manage risk in a dynamic situation.

   Search and rescue missions also fall in this category. Encountering unexpected winds at a helispot is another common occurrence, where the Pilot must rapidly assess the risk and determine whether to land, attempt to land at another spot farther from the objective, or abort the mission and return to base.

   Note that **time critical** does not mean “hasty” or “uninformed”.

2. Deliberate. This type is used when planning time permits. It involves systematic risk identification, evaluation, consideration of control options and risk decision making, implementation of controls, and supervision. Note that all of these may be applied to time critical risk management; however, the time frame in which the rapid examination is performed is extremely compressed by the urgency of the situation.

   This is the type of risk assessment that should be performed by the Air Operations Branch Director in completing the ICS-220 Air Operations Planning Summary, by the Helibase Manager in briefing personnel and discussing intended missions, and by project personnel when planning a flight mission days or weeks in advance.

   For example, if a Wild Horse and Burro Specialist knows that she must perform a census in a certain area at a specific time of year, there is ample time to identify and evaluate hazards (wires, military training routes, deep canyons, etc.), develop and implement controls (for example, coordinate with the military to de-conflict airspace), and supervise preparations for the mission.

3. Strategic/In-Depth. This type should be used in instances where new technology is being proposed, when risks appear high, and time and resources allow thorough assessment. Risk management at this level requires more sophisticated techniques and professional reviews.

   An example would be the Safety Management System testing and implementation of a new aerial firing device, new external load method, or new method of personnel delivery. In these cases, handbooks and operating procedures must also be developed and/or revised.

C. Risk Management Process.

During mission planning, risk decisions should be made at a level of command that corresponds to the degree of risk. For personnel at the field level a general field appraisal may often be sufficient and may be accomplished through the use of one of the risk management tools that are discussed in Appendix J.

IMPORTANT NOTE: Risk management tools have been moved to Appendix J.

Medium-risk decisions should be elevated to a somewhat higher level (for example, to the Air Operations Branch Director or Project Aviation Manager level). Low-risk decisions can usually be made at the Helibase Manager or Helicopter Manager level. Refer to Appendix J for guidance.

During mission planning, risk decisions should be made at a level of command that corresponds to the degree of risk. **The Pilot and/or Helicopter Manager always have the authority to decline the mission.**

How to Properly Refuse Risk

Every individual (government and contract) has the right and obligation to report safety problems affecting his or her safety and has the right to contribute ideas to correct the hazard. In return, supervisors are expected to give these concerns and ideas serious consideration. **When an individual feels an assignment is unsafe, he or she also has the obligation to identify, to the degree possible, safe alternatives for completing that assignment.** Turning down an assignment is one possible outcome of managing risk.

A "turn down" is a situation where an individual has determined he or she cannot undertake an assignment as given and is unable to negotiate an alternative solution. The turn down of an assignment must be based on assessment of risks and the ability of the individual or organization to control or mitigate those risks. Individuals may turn down an assignment when:

1. There is a violation of regulated safe aviation practices.
2. Environmental conditions make the work unsafe.
3. They lack the necessary qualifications or expertise.

Individuals will directly inform their supervisor that they are turning down the assignment as given. The most appropriate means of documented turn down criteria is using the Aviation Watch Out Situations. See Exhibit 3-4.

The supervisor will notify the Air Operations Branch Director immediately upon being informed of a turn down. If there is no Air Operations Branch Director, notification shall go to the appropriate Section Chief, the Incident Commander, or the local Aviation Manager. Proper handling of turn downs provides accountability for decisions and initiates communication of safety concerns within the incident organization.

If the assignment has been turned down previously and the supervisor asks another resource to perform the assignment, he or she is responsible to inform the new resource that the assignment has been turned down and the reasons why. Furthermore, the personnel need to realize that a turn down does not stop the completion of the assigned operation. The turn down protocol is an integral element that improves the effective management of risk, and it provides timely identification of hazards within the chain of command, and raises risk awareness for both supervisors and subordinates and promotes accountability.

If an unresolved safety hazard exists, the individual needs to communicate the issue/event/concern immediately to their supervisor and document as appropriate, including filing an Aviation Safety Communique (SAFECOM).

IV. Types of Flight Missions.

Informational needs, flight following methods, requirements for personal protective equipment, aircraft/Pilot carding, and required management approvals differ between point-to-point and mission-type flights, and between general use and special use flight. In order to identify the type of flight, the following definitions have been established.

A. Point-to-Point vs. Mission Flight.

1. Point-to-Point Flight. Typically, the flight originates at one developed airport or permanent helibase, with flight route being direct to another developed airport or permanent helibase. The flight is conducted solely for the purpose of transportation of persons or cargo for administrative travel purposes, and does not involve mission-type flight.

   When planning to deviate from a direct route for aerial surveillance or other reasons, the deviation must be specified and documented in advance.

   Except in an emergency or at the direction of an air traffic control facility, there shall be no deviation from the submitted flight plan while en route unless the agency representative aboard the aircraft reports the amended flight plan to a designated point-of-contact.

   All point-to-point flight is considered general use flight (see general and special use definitions below).

2. Mission Flight. These flights are defined by exclusion as all flights not meeting the definition of “point-to-point” flight. As such, mission flight requires work to be performed in the air (for example, retardant or water delivery, reconnaissance, etc.), or through a combination of ground and aerial work (for example, delivery of personnel and/or cargo from helibases to helispots or unimproved landing sites, rappelling or cargo letdown, horse herding, etc.).

   Mission flight inherently requires greater planning due to the greater number of hazards and consequent higher degree of risk commonly involved in non-point-to- point flights.

B. General Use vs. Special Use.

Flights are also categorized as either "General Use" or "Special Use" activities. Special use flights require additional Pilot qualifications, aircraft equipment, and passenger safety equipment. All helicopter flights, including those aboard cooperator, military, and other government agencies' aircraft, shall conform to the requirements as outlined in appropriate agency directives.

1. General Use. A point-to-point flight is general use flight. Mission flight conducted at greater than 500 feet AGL, with no descent at any time below 500 feet AGL, is also general use flight. During a flight mission, the type of use shall not change from a planned "general use" environment to an unplanned "special use" flight environment unless the following conditions have been met:

   - Required personal protective equipment is being worn by both Pilot and all passengers.
   - Line manager approval is obtained prior to the change in type of flight activity.
   - Pilot and aircraft are carded for the special-use activity, as verified by either the Dispatcher or the Helicopter Manager.
   - The Dispatcher or other point-of-contact reviews the unit aerial hazard map and relevant information on area of operations is relayed to the Pilot or Helicopter Manager.

These requirements are waived when a life-threatening situation exists on the ground, and intervention or surveillance by the occupants of the helicopter will avert the situation. Such situations shall be documented by the Helicopter Manager or Flight Manager and a report submitted to the unit aviation manager.

   - The Pilot performs a high-level reconnaissance above 500 feet AGL of the area to identify hazards prior to descent to low level.

2. Special Use. Special use activities are described as operations involving helicopters which require special considerations due to their functional use. This may require deviation from normal operating practices when authorized. Special Pilot qualifications and techniques, special aircraft equipment, and personal protective equipment are required to enhance the safe transportation of personnel and property.

   Special use flight includes the following missions:

   - Flights conducted below 500 feet AGL
   - Water or retardant application
   - Parachute delivery of personnel or cargo (not usually performed using helicopters)

- HLCO and Air Tactical Group Supervisor operations
- Aerial ignition activities
- Air Tanker Coordinator operations (not usually performed using helicopters)
- External Loads (Class B, C, or D as defined in 14 CFR 133)
- Night Vision Goggle operations
- Hoversite/Autosurvey
- Rappel
- Short-Haul
- ACETA
- Offshore vessel or platform landings
- Toe-in, single-skid and step-out landings (prior authorization or exemption required)
- Takeoff or landing requiring special techniques due to hazardous terrain, obstacles, pinnacles or surface conditions

V. Specific Missions.

A. Law Enforcement.

See Chapter 16 for discussion of law enforcement specific missions and operational requirements.

B. Search and Rescue.

See Chapter 17 for discussion of search and rescue specific missions and operational requirements.

C. Aerial Ignition.

All aerial ignition operations shall be conducted in conformance with the *Interagency Aerial Ignition Guide*.

D. Rappel.

The use of rappel requires agency approval. Training, qualification, and certification shall be in accordance with the current copy of the *Interagency Helicopter Rappel Guide*. Tactical use of rappelling will be determined by the individual agency.

E. Short-haul

The use of helicopter short-haul requires agency approval. Training, qualification, and certification shall be in accordance with the current copy of the *Helicopter Short-Haul Handbook*. Tactical use of helicopter short-haul will be determined by the individual agency.

F. Aerial Capture, Eradication and Tagging of Animals.

ACETA operations are conducted primarily by DOI bureaus. For these operations, refer to the *ACETA Handbook*. Bureaus may have additional internal guidance. Other agencies conducting ACETA operations may wish to use the handbook as guidance.

G. Media.

Transportation of media personnel may be conducted in government helicopters provided media personnel meet the definition of “official passengers”. Refer to agency specific direction concerning level of approval needed to conduct flights with media on board. Media personnel must adhere to all requirements (for example, personal protective equipment). See Chapter 10.

H. External Load Operations.

External load operations include water bucket operations, seeding, sling loads using either lead line/swivel/cargo hook or the swivel/remote electric hook/longline. When planning an operation which will involve external loads, the personnel requirements and operational procedures outlined in Chapter 11, Cargo Transport, shall be followed. Chapter 11 also includes recommendations for the transport of material or equipment when standard methods cannot be used.

VI. Project Flight Planning and Scheduling Process.

Flight planning involving all participants in the intended mission serves to reduce the risk inherent in any aviation mission to acceptable levels. Levels of aviation safety and efficiency can be significantly improved by comprehensive planning of both one-time and recurrent aviation projects. Individuals who have a need to initiate or participate on a flight mission should consult their agency’s manual and handbooks for the specific process and procedures to be followed.

The following is a discussion of recommended procedures for project operations, with Sections J through N applicable to both resource/project and incident operations.

A. Elements of the Process.

There are common elements involved in any planning and aircraft scheduling process. This process should consist of:

- An Aircraft Flight Request/Schedule submitted by the user requesting the mission. See Exhibit 3-1.
- A cost-analysis performed by the Dispatcher or individual scheduling the flight[3].
- A Dispatch/Aviation Manager Checklist and Hazard Analysis performed by the requester (assigned Helicopter/Flight Manager), the scheduler (the Dispatcher and/ or Aviation Manager), and for complex missions, the Pilot. See Exhibit 3-2.
- Higher-level approval(s) which may be required[4].
- Standard Aircraft Safety Briefing completed by the Helicopter Manager or Project Flight Manager and Pilot just prior to the flight.
- A post-flight evaluation which identifies any problems encountered so that corrective action can be taken on future flights.

B. Frequency of Completion.

1. One-Time Missions. The elements of the flight planning and scheduling process described above should be addressed or completed for each flight mission.
2. Recurrent Special Use Projects and Operations. For recurrent flight missions of a similar nature in a special use environment, scheduling and approval requirements can be reduced by the completion of a Project Aviation Safety Plan. See Exhibit 3-3.
   a. Purpose. The purpose of a Project Aviation Safety Plan is to:
      - Ensure that recurrent flights in special use environments (primarily flight below 500 feet AGL) are adequately planned and that management is aware of and has approved flight in the special use environment.
      - Document the information required on the Aircraft Flight Request form and the Dispatch/Aviation Manager Checklist and Hazard Analysis for successive, similar missions. The Project Aviation Safety Plan can relieve

[3] Note that Office of Management and Budget (OMB) Circular A-126 requires a formal cost-analysis only for point-to-point ("administrative travel") flights. Performance of a cost- analysis of different makes and models of helicopters, as well as of various vendors or other aircraft sources available, for all flights is highly recommended. Refer to agency-specific direction concerning requirements for a cost-analysis of mission-type flight. The Interagency Helicopter Approval Performance Index (IHAPI) for Type 1 and 2 CWN helicopters is recommended.

[4] Agency-specific direction may require line manager approval for special use flights. Administrative travel flights with senior federal officials on board require higher approvals and documentation (see OMB Circular A-126).

the user from completing repetitive information (hazards, communications, etc.) on the flight request each time a flight is made to the same area(s). For scheduling and manifesting purposes, the Aircraft Flight Request is completed for each use. However, only that information not contained in the Project Aviation Safety Plan is required, such as date/time of flight, manifest, etc.

b. Applicability. The Project Aviation Safety Plan should be completed for all recurrent special-use flights for the same project to the same areas(s). Examples are wild horse counting or herding, bald eagle survey, communication site repair, etc.

c. Responsibilities and Requirements for Completion. The local Aviation Manager and Project Aviation Manager are jointly responsible for determining the need for a Project Aviation Safety Plan. Plans are generally completed in the following sequence:

(i) Project Aviation Manager or assigned Helicopter/Flight Manager completes the majority of plan information.

(ii) Dispatcher completes flight following and emergency search and rescue information.

(iii) An aerial hazard analysis is completed jointly by the Project Aviation Manager, the Helicopter Manager, the Dispatcher, and the unit Aviation Manager.

(iv) Unit Aviation Manager reviews and recommends.

(v) Line Manager or designee reviews and approves. Note that approval is not automatic. The Manager may choose to make a risk management decision to not conduct the operation as planned, or to not conduct the mission at all.

d. Content. As a minimum, the plan shall consist of those elements depicted in Exhibit 3-3 at the end of this chapter.

e. Routing and Filing. After approval by line management the plan is maintained in the Dispatch Office for reference during flight.

f. Annual Review and Update. The plan should be reviewed annually by the unit Aviation Manager for currency of information, with at least annual re-approval by line management. Updates should be performed as necessary. More frequent review and update may be necessary if the type of mission, location, etc., change.

C. Aircraft Flight Request/Schedule Preparation.

The following is a suggested format for ensuring all elements of the flight request and scheduling process are met. All flights should be requested and scheduled using the following procedures.

- The Aircraft Flight Request/Schedule is completed jointly by the Helicopter/Flight Manager assigned and the Dispatcher or Aviation Manager. See Exhibit 3-1.

- The Dispatcher and/or unit Aviation Manager completes the Dispatcher/Aviation Manager Checklist. See Exhibit 3-2.
- For special use flights, a Hazard Analysis is completed jointly by the Helicopter Manager or Flight Manager and the Dispatcher or Aviation Manager. See Exhibit 3-2.
- For cooperator (Civil) or other-government agency aircraft, refer to agency specific direction on the approval process. For military aircraft, refer to *Military Use Handbook* for ordering and approval process. Gaining approval for use of these types of aircraft is the joint responsibility of the Dispatcher, unit Aviation Manager, and the individual requesting the aircraft.
- The Aircraft Flight Request/Schedule must be relayed to all personnel and offices involved in the flight including other dispatch offices, the Pilot, and the Helicopter/Flight Manager. This may be accomplished by automated flight planning and transmission by email, fax or telephone. The Helicopter/Flight Manager is responsible for relaying flight specifics to other passengers.

D. Manifest.

All personnel on the manifest must meet the definition of “air crewmember” or “authorized passenger” and “official passenger.” See Glossary.

E. Aircraft Capability and Selection Factors.

To complete any helicopter mission safely and efficiently the aircraft must have passenger/ cargo carrying capacity and sufficient power capability for anticipated temperature(s) and elevation(s).

Aviation Managers and Dispatchers must be trained in, and knowledgeable of, helicopter capabilities and limitations in order to schedule the proper aircraft.

During the scheduling process for project flights, the intended mission shall always be discussed in depth with the vendor and preferably with the Pilot assigned to the mission.

It is essential that Pilots perform load calculations. Appendix A contains instructions and procedures for completion of the load calculation and manifest forms.

When selecting helicopters, several factors must be taken into consideration to determine an aircraft appropriate for the mission.

1. Capabilities. Each aviation management office should maintain a current copy of the specification of helicopters commonly used and which summarizes performance capabilities of those aircraft. This data may be used for program planning, but shall not be used to perform the actual helicopter load calculation prior to takeoff.
2. Limitations. Limitations to consider in operational planning may include, but are not limited to:

- Number of passenger seats
- Aircraft performance given the density altitude at takeoff and landing sites
- Skid or wheel footprint given the size of landing pad
- Radio equipment capability (does helicopter have VHF-FM equipment?)
- Cargo-carrying equipment (does helicopter have cargo hook or remote electric hook/longline equipment, cargo compartment, etc.?)

3. Anticipated Environmental Conditions. All environmental factors should be considered when selecting an appropriate helicopter. Temperatures, wind speed and direction, visibility, and local weather anomalies can impact aircraft capabilities, mission profile and fuel burn.

F. Aircraft Cost-Comparison Analysis.

1. Requirements. OMB Circular A-126 requires that a cost analysis and comparison of different aircraft and vendors be performed for point-to-point administrative travel flights. States may have similar requirements.

   It is recognized that the majority of helicopter flights involve non-point-to-point, mission-type flight for which this cost comparison may not be required. If a helicopter flight falls within the point-to-point definition, then a cost-comparison that meets OMB Circular A-126 requirements must be performed.

   It is also recommended that a cost comparison be completed for helicopter mission flights. Often a helicopter that has a more expensive hourly rate will prove to be cheaper due to a variety of factors, including higher cruise speed during ferry, greater load-carrying capability, and other factors.

2. Documentation. The comparison and the reason for selecting any aircraft other than the lowest cost aircraft (for example, safety considerations, cannot meet ordered time frames, etc.) should be documented in writing.

G. Scheduling Aircraft with Vendors.

The following guidance applies primarily to project flights.

1. Documentation of Contacts. Once a preliminary flight plan has been prepared and a cost comparison performed, the Scheduling Dispatcher may contact a vendor to determine availability. These contacts may be documented on a Resource Order Form or other appropriate format.

2. Vendor Review of Flight Request and Preliminary Flight Plan. During the scheduling contact, the preliminary flight plan must always be reviewed with the vendor and preferably the Pilot who will fly the mission. Scheduler should relay an accurate itinerary and manifest along with the desired sequence of events. Flight plans should be amended at this time, subject to aircraft limitations, refueling needs, or other concerns identified by the vendor. More

complex projects may require in-person meetings with the vendor to plan the flight or project correctly.

H. Obtaining Approved Pilots and Aircraft.

During the scheduling process, the individual scheduling the aircraft must ensure that the vendor provides approved Pilots and aircraft.

Aircraft and Pilots shall not be scheduled or dispatched unless it is verified that both are approved and current for the mission. Note that use of other-government agency, military, and civil aircraft requires approval, but not necessarily carding.

Initially it is the responsibility of the Dispatcher to verify that the equipment and Pilots are carded. This may be done by reference to the agency's vendor source list. The Dispatcher should then verify with the vendor that the Pilot(s) and aircraft are approved and that the Pilot is current for the intended mission.

I. Obtaining Necessary Equipment.

It is essential that the individual submitting the flight request give sufficient information to ensure any specialized mission equipment requirements are met, especially for equipment which is to be supplied by the vendor. Local operating plans should specify procedures for obtaining agency supplies such as handheld radios, external load equipment and personal protective equipment.

J. Analyzing Known Aerial Hazards.

The special use flight profile of low altitude flight places people and equipment in a higher risk area of potential wire strikes, mid-air collisions with other low flying aircraft, and impact with obstacles protruding beyond normal surface features.

To mitigate this risk, Pilots, helicopter and flight managers, and passengers must be made aware of obstacles which they may encounter during low-level operations.

Known aerial hazards must be identified and analyzed during the flight planning process. Managers must be made aware of the associated risk and make a risk management decision to accept those risks, provided they are properly mitigated, require the mission to be changed to avoid identified risks, or cancel the flight.

1. Local Unit Hazard Maps. Known flight hazards must be identified on the unit's "Known Aerial Hazard Map." Managers of each permanent helibase shall obtain and post a flight hazard map.

    b. Purpose. The purpose of aerial hazard mapping is to identify aerial hazards within and/or near local administrative boundaries so that flight safety awareness by the Pilot, the helicopter manager and passengers is achieved.

c. Applicability. Each unit shall maintain a current aerial hazard map in each location where flight planning, flight tracking and aircrew dispatching occur. The master map should be located in the office where flight planning and scheduling is accomplished (for example, in the dispatch office). For units without dispatch offices, the hazard map should be located where flights are normally planned and scheduled. Maps shall also be maintained at permanent helibases.

d. Responsibility and Requirements for Completion. Unit Aviation Managers are responsible for ensuring the development and update of Known Aerial Hazard Maps. All personnel are responsible for reporting aerial hazards to the designated point-of-contact for inclusion on the Hazard Map.

Particular emphasis should be placed on identifying those obstructions not normally indicated on government published flight maps including old mining wires, stream flow gauges, areas of extreme turbulence, etc.

Medical facilities (hospitals, clinics, etc.) with landing areas or heliports should be shown on the hazard map. Those with air transport (“life flight”) capability should be so indicated.

If not already marked, all airports, landing strips and heliports/helibases should be added.

Each flight request or resource order for non-point-to-point, mission-type flights, regardless of altitude, must have known hazards identified or a hazard map attached.

e. Instructions for Completion. Potential hazards and emergency services as identified above must be marked. Method of marking is optional, but may be determined by agency-specific direction.

2. Hazard Maps on Large Incidents.

a. Aviation Manager Responsibility. Prior to the start of the second full operational period, the Dispatcher shall furnish the incident air operations staff and all aircraft operating bases with a copy of the current local aerial hazard map for the area surrounding the incident, as well as the areas surrounding any aircraft operating bases.

b. Air Operations Branch Responsibility. Upon arrival at the incident, the Air Operations Branch Director or designee shall make an aerial survey of incident operations airspace and shall post a detailed Aerial Hazard Map at all aircraft operating bases. This map is usually the one received from dispatch, with any amendments or additional hazards observed added.

During the initial stages of a large incident, the Air Operations Branch Director position may be filled by the Operations Section Chief or by one of the sub-functions of the branch (for example, by a Helibase Manager). It shall be the responsibility of that individual to perform the above survey. The local unit Aviation Manager should ensure compliance.

Hazards shall be reviewed each morning during the briefing of Pilots and helibase support personnel.

3. In-Flight Hazard Identification. To reduce wire strike potential, it is essential that an on-site risk assessment be conducted prior to all low-level flights. All low-level flights require a thorough, high-level reconnaissance of the route to be flown. Transition to an unplanned low-level flight mode should only be conducted when determined to be critical to the safety of the operation. Extreme caution shall be exercised.

K. Airspace Coordination.

Personnel involved in helicopter operations shall follow all processes and procedures outlined in the *Interagency Airspace Coordination Guide*. Positions such as the Air Operations Branch Director, Air Support Group Supervisor, Air Tactical Group Supervisor, Helibase Manager and Project Aviation Manager are all responsible for:

Evaluating the airspace surrounding the incident to include, but not limited to:

- Identifying Military Training Routes, Special-Use Airspace, Visual Flight Rules (VFR) Airways, etc., which may impact air operations
- Identifying these areas on the Incident or Project Hazard Map
- Ensuring all Pilots are briefed on these hazards

Ensuring that a TFR is in place when appropriate.

- NOTAMS are advisable for some project work (horse herding, construction longline, etc.)

Reporting any violations through the SAFECOM reporting system.

Ensuring the TFR is cancelled when no longer necessary.

L. Flight or Driving Time and Duty Day Limitations.

For safety purposes, flight or driving time and duty day limitations must be taken into account when planning flights. Care should be taken that limitations not be exceeded. For contractor personnel, limitations are stated in the procurement document.

M. Personal Protective Equipment and Aviation Life Support Equipment.

Requirements for personal protective equipment are determined by the type of flight. The type of ground operation being performed also will determine PPE required (for example, hover hookup or working around operating helicopters).

N. Communication Plan.

Radio frequencies must be designated for Air-to-Air, Air-to-Ground and Ground-to- Ground operations. Identification of the means of flight following and the methods by which it will be accomplished is an essential part of the communication plan.

VII. Fire Aircraft Aviation Safety Plans.

Units shall have Fire Aviation Safety Plans when engaging in incident aviation operations. These plans should include an Operations Plan for exclusive-use contract and CWN helicopter crews assigned to the unit. When using the helicopter for project missions, processes and procedures described in the preceding section should be followed.

The Resource Order is used to order or dispatch tactical or reconnaissance/detection fire helicopters on initial attack on the local unit. Appendix A contains an optional form, Flight Order: Helicopter, for use by the Helicopter Manager when receiving flight information from a dispatch office.

During incident helibase operations, other formats are used to schedule missions. See Appendix B.

Sections VI.J through VI.N in the previous section are applicable to both project and incident operations.

VIII. Pre-Flight Briefings.

A briefing covering both the specifics of the intended mission and helicopter safety is required. See Appendix A for additional information.

IX. Post Flight Evaluation.

Just as the pre-flight briefing is deemed essential to the success of a mission, the post flight evaluation of a flight is likewise important in order to correct problems encountered.

Exhibit 3-1: Aircraft Flight Request/Flight Schedule

AIRCRAFT FLIGHT REQUEST/FLIGHT SCHEDULE

CHANGE #:

6. AIRCRAFT INFORMATION FAA N#:

FLIGHT SCHEDULE #:

MAKE/MODEL: # SEATS:

COLOR:

VENDOR:

PHONE #:

PILOT(S):

1. INITIAL REQUEST INFORMATION

COST-ACCOUNT/MANAGEMENT CODE(S):

BILLEE CODE (OAS A/C only)

INITIAL DATE/TIME: TO/FROM: PHONE NUMBER:

CHECK ONE: ( ) Point-to-Point Flight ( ) Mission Flight DESIRED A/C TYPE: ( ) Helicopter ( ) Airplane

MISSION OBJECTIVE/SPECIAL NEEDS:

2. PASSENGER/CARGO INFORMATION: INDICATE BY ASTERISK WHICH PASSENGER LISTED BELOW IS CHIEF-OF-PARTY.

NAME/TYPE OF CARGO	LBS OR CU FT	PROJECT ORDER/ REQUEST NO.	DEPT ARPT	DEST ARPT	RETURN TO	NAME/TYPE OF CARGO	LBS OR CU FT	PROJECT ORDER/ REQUEST NO.	DEPT ARPT	DEST ARPT	RETURN TO

3. FLIGHT ITINERARY (For Mission-Type Flights, provide points of Departure/Arrival and attach Map With Detailed Flight Route and Known Hazards Indicated)

DEPART WITH			DEPART FROM			ENROUTE	ARRIVE AT			DROP OFF		KEY POINTS	INFO RELAYED
Date	No. Pax	Lbs.	Airport/Place	ETD	ATD	ETE	Airport/Place	ETA	ATA	No. Pax	Lbs	Drop-Off Points, Refueling Stops, Flight Check-ins, Pickup Points	TO/FROM
						+							
						+							
						+							
						+							
						+							
						+							
						+							

4. FLIGHT FOLLOWING

( ) FAA IFR ( ) Satellite

( ) FAA VFR With Check-in Every ____ Minutes To

( ) FAA or ( ) Agency

( ) Agency VFR With Check-in via radio Every ____ Minutes

Frequency(ies):

5. METHOD OF RESOURCE TRACKING:

( ) PHONE ( ) RADIO

( ) To Scheduling Dispatcher @ ____________ (PHONE NUMBER)

( ) Prior to Takeoff ( ) Each Stop Enroute ( ) Arrival At Destination

( ) To: ____________ (OTHER OFFICE) @ ____________ (PHONE NUMBER)

7. ADMINISTRATIVE

Type of Payment Document:

( ) OAS-23 or ( ) OAS-2

( ) FS 6500-122

OTHER:

Route Document To:

8. REVIEW (if applicable)

___ Hazard Analysis Performed

___ Dispatch/Aviation Mgr Checklist

___ Other:

9. CLOSE-OUT CLOSED BY:

Exhibit 3-2: Hazard Analysis and Dispatch/Aviation Manager Checklist

HAZARD ANALYSIS AND DISPATCH/AVIATION MANAGER CHECKLIST

I. MISSION FLIGHT HAZARD ANALYSIS (fire flights exempt provided a pre-approved plan is in place). The following potential hazards in the area of operations have been checked, have been identified on flight itinerary map, and will be reviewed with Pilot and Chief-of-Party prior to flight:

- ☐ Military Training Routes (MTRs) or Special-Use Airspace (MOAs, Restricted Areas, etc.)
- ☐ Areas of high-density air traffic (airports); Commercial or other aircraft
- ☐ Wires/transmission lines; wires along rivers or streams or across canyons
- ☐ Weather factors: wind, thunderstorms, etc.
- ☐ Towers and bridges
- ☐ Other aerial obstructions:
- ☐ Pilot flight time/duty day limitations and daylight/darkness factors

  SUNRISE: ____________

  SUNSET: ____________
- ☐ Limited flight following communications
- ☐ High elevations, temperatures, and weights:

  MAX LANDING ELEV (MSL): ____________

  MIN. FLIGHT ALTITUDE AGL: ____________
- ☐ Transport of hazardous materials
- ☐ Other: ____________________

II. DISPATCHER/AVIATION MANAGEMENT CHECKLIST

- ☐ Pilot and aircraft carding checked with source list and vendor; carding meets requirements;
- ☐ OR, Necessary approvals have been obtained for use of uncarded cooperator, military, or other-government agency aircraft and pilots
- ☐ Check with vendor that an aircraft with sufficient capability to perform mission safely has been scheduled
- ☐ Qualified Aircraft Chief-of-Party has been assigned to the flight (noted on reverse)
- ☐ All DOI passengers have received required aircraft safety training;
- ☐ OR, Aviation manager will present detailed safety briefing prior to departure;
- ☐ Bureau Aircraft Chief-of-Party will be furnished with a Chief-of-Party/Pilot checklist and is aware of its use
- ☐ Means of flight following and resource tracking requirements have been identified
- ☐ Flight following has been arranged with another unit if flight crosses jurisdictional boundaries and communications cannot be maintained
- ☐ Flight hazard maps have been supplied to Chief-of-Party for nonfire low-level missions
- ☐ Procedures for deconfliction of Military Training Routes and Special-Use Airspace have been taken
- ☐ Chief-of-Party is aware of PPE requirements.
- ☐ Cost analysis has been completed and is attached
- ☐ Other/Remarks:

III. APPROVALS

Note: Reference Handbook 9420 for approval(s) required.

A. MISSION FLIGHT: HAZARD ANALYSIS PERFORMED BY:

____
Chief-of-Party Signature

B. MISSION FLIGHT: HAZARD ANALYSIS REVIEWED BY:

____
Dispatcher Or Aviation Manager Signature Required

C. IF NON-FIRE, ONE-TIME (NON-RECURRING), SPECIAL-USE MISSION, SIGNATURE OF LINE MANAGER IS REQUIRED **:

____________________ DATE: ________

D. THIS FLIGHT IS APPROVED BY (Authorized Signature):

____________________ DATE: ________

*** For recurring Special-Use Missions, signature is required on Special-Use Air Safety Plan, and not required here.*

Exhibit 3-3: Elements of a Project Aviation Safety Plan

Identify qualified Project Aviation Manager and/or Helicopter Manager **Project Name and Objectives**. Brief description of the project and its objectives. **Justification**. Indicate why the project will require the use of aircraft in special-use flight conditions/environments and list the most practical alternative for completion of the project.

Project Dates. Dates project will begin and end. These may be approximate, since exact dates of flights may not be known.

Location. Enter descriptive location and include a map clearly showing area where flights will be made. Aerial hazards must be clearly indicated.

Projected Cost of Aviation Resources. Enter cost coding, projected flight hours and cost, projected miscellaneous expenses (overnight charges, service truck mileage, etc.), and total cost of project.

Aircraft. If known, identify company(ies) that own(s) aircraft anticipated to be used, registration number, aircraft type, date of aircraft data card expiration and missions for which aircraft is approved.

Pilot. If known, identify Pilot(s), type of aircraft qualified in, type of missions qualified for and Pilot card expiration date.

Participants. List individuals involved in flights, their qualifications (Helicopter Manager, Passenger, Helibase Manager, etc.), dates of last aviation training and include individuals' project responsibilities.

Communication Plan, Flight Following and Emergency Search and Rescue. Identify the procedures to be used.

Aerial Hazard Analysis. The project Aviation Manager develops an aerial hazard analysis with attached map. Flights made in confined areas (e.g. deep, narrow canyons) require that a prior ground and/or aerial survey of hazards be made. A copy of the hazard map shall be provided to the Pilot prior to any project flights. The necessary temporary flight restrictions and coordination with the Federal Aviation Administration and, if appropriate, military authorities, must be accomplished prior to project flights.

Protective Clothing and Equipment. Identify the protective equipment and clothing necessary for the particular operation. Survival equipment (extra water, flotation devices, sleeping bags, etc.) beyond the normal PPE complement may be required.

Load Calculations. The Pilot is responsible for the accurate completion of load calculations. Trained aviation personnel shall ensure that aircraft scheduled are capable of performing the mission(s) safely and within the capabilities of the aircraft selected. The Helicopter Manager shall ensure that manifests and load calculations are completed properly and are completed daily.

Signatures. Appropriate level of approval such as supervisor or line officer.

Exhibit 3-4: Aviation Watch Out Situations

Aviation Watch Out Situations

Is this flight necessary?

Who is in charge?

Are all hazards identified and have you made them known?

Should you stop the operation or flight due to change in conditions?

– Communications	– Turbulence
– Conflicting Priorities	– Weather
– Personnel	– Confusion

Is there a better way to do it?

Are you driven by an overwhelming sense of urgency?

Can you justify your actions?

Are there other aircraft in the area?

Do you have an escape route?

Are any rules being broken?

Are communications getting tense?

Are you deviating from the assigned operation or flight?

NFES 1129 (1998)

CHAPTER 4: COMMUNICATIONS, FLIGHT FOLLOWING AND RESOURCE TRACKING.

I. Introduction.

Communications, flight following and resource tracking are key components in promoting employee and aircraft mission safety and efficiency. It is important that a line of communications be established and maintained throughout the aviation and dispatch organizations. Communications at all levels should be encouraged to resolve situations before they become a problem.

Local units should ensure that the existing communications network is adequate to meet both fire and project flight needs. Unit Aviation Managers or dispatchers should report, through submission of a SAFECOM, any discrepancies in the flight following system. These discrepancies may involve human performance problems (for example, failure to adhere to check-in requirements) or failures or limitations in the system (for example, inoperative equipment, inadequate coverage areas, etc.). Corrective action shall be given a high priority.

Personnel must be furnished and aircraft must be equipped with sufficient radio capabilities and maps to meet safety objectives.

- The Pilot is required to carry sectional aeronautical charts of the area(s) of operations.
- On all non-point-to-point, mission flights, it is recommended that the Helicopter Manager carry topographic maps (1:250,000 AMS suggested) of the area(s) of operations.
- Contract aircraft, and where possible, local vendor aircraft used on a recurring basis, should be equipped with agency compatible radios.
- Special use missions require communications equipment that will allow radio check- ins to be made without removal of the approved flight helmet. Agencies should obtain avionics equipment that provides for this requirement.

> NOTE: If check-ins cannot be made due to equipment failure, the aircraft shall return immediately to the departure point or proceed to the closest facility where a check-in can be made via telephone. The flight must not proceed until the problem is corrected and positive communications are established. Dispatchers are instructed to institute “Overdue Aircraft” procedures when check-in requirements are not met.

II. Flight Following.

Flight following is the knowledge of the aircraft location and condition with a reasonable degree of certainty such that, in the event of mishap, those on board may be rescued. Flight following, whether performed from a dispatch office or other facility, or at a remote location in the field, must be given a high priority by all personnel involved.

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

- Ensure the safety and welfare of flight crew and passengers.
- Perform resource tracking to promote effective use of aircraft.
- Provide information for the administrative processing of aviation related documents.

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

Flight following procedures outlined here are more restrictive than the national flight following procedures contained in the *National Mobilization Guide*.

A. Identification of Flight Following Requirements.

At the time the flight is planned or during morning briefings at incident helibases, flight following requirements should be clearly identified by the dispatcher, unit aviation manager, helicopter or project flight manager, helibase manager or other responsible party.

This individual should identify check-in procedures to include time and locations, dispatch office(s) or other flight following facilities involved, individuals responsible for flight following, frequencies to be used and any special circumstances requiring check-ins (for example, to military facilities within Special Use Airspace).

B. Methods of Flight Following.

There are several methods to accomplish flight following. Refer to Chart 4-1 for a summary of these methods, those that are appropriate for point-to-point flight, and those appropriate for mission flight. Flights following methods include:

- An Instrument Flight Rules (IFR) flight plan. This method is not usually used for helicopter point-to-point or mission flights.
- A VFR flight plan with radio/telephone check-in to an FAA facility or agency dispatch office at intervals specified. This method should be used for helicopter point-to-point missions, especially long-distance ferry flights to and from projects or incidents.

- An agency VFR flight plan with radio/telephone check-in at intervals specified in the flight plan not to exceed agency minimums. Minimums vary for point-to-point and mission flights. See Chart 4-1.
- Systems with automated flight following (AFF) via satellite whose reporting intervals meet agency minimums (see https:\\www.aff.gov).
- Aerial supervision using ATGS, HLCO or others. This is often the way to maintain communications with aircraft involved in low level flight operations.

For specialized flight following procedures during law enforcement operations, see Chapter 16.

C. Documentation of Flight Following.

The following requirements apply to agency flight following only and are not applicable to flight following performed through the FAA system. In the event of a mishap, the speed and effectiveness of search and rescue is dependent on the accurate transmission and recording of flight following information.

1. Dispatch Flight Following Log for Project Flights. Flight-following is accomplished using local forms and procedures for project missions.
2. Helibase Flight Following Log. Form HBM-9, Helibase Flight Following Log, shall be used for all flight following during project or fire helibase operations.

D. Check-In Facilities.

1. FAA Flight Following. For FAA flight plans, check-ins are made with FAA facilities upon departure, while enroute and upon arrival at destination.
2. Agency Flight Following. Check-ins may be made with either the dispatcher or with trained personnel or other aircraft at the incident/project site (e.g., helibase, Incident Commander, etc.). When field (on-site) flight following is approved, ground personnel performing the flight following must have contact with dispatch to allow timely reporting of any accidents, incidents, hazards or problems encountered.

Chart 4-1: Flight Following and Resource Tracking Options and Requirements

	Flight Following	**Resource Tracking**
Point -to- Point	OPTIONS 1. FAA IFR Flight Plan 2. FAA VFR With Check-in Every ____ Minutes To FAA 3. Agency VFR With Check-in via radio Every ____ Minutes To Agency Dispatch Frequency(s): 4. Satellite-based Automated Flight Following System	Resource Tracking may be performed by PHONE or RADIO (if aircraft is equipped with VHF-FM) Check-ins are made 1. With Scheduling Dispatcher @ ____________________ ____________________ **(PHONE NUMBER)** ( ) Prior to Takeoff ( ) Each Stop Enroute (optional; negotiated with Dispatcher) ( ) Arrival At Destination 2. As specified by the Dispatcher, Check-ins may also be made with another office: ____________________________________ **OTHER OFFICE** **@ ____________________________(PHONE NUMBER)**
Mission	OPTIONS (Flight Following and Resource Tracking Become The Same) 1. Agency VFR With Check-in via radio Every ____ Minutes Frequency(s): 2. Satellite-based Automated Flight Following System 3. Aerial Supervision With Check-in via radio Every ___Minutes, Frequency___ and Call Sign	

E. Check-In Requirements.

Check-in requirements differ between point-to-point and mission flights.

> NOTE: Exceptions must be made in Alaska due to long distances and incomplete FAA and agency communications facilities. 60 minute interval check-ins for point-to-point flights and 15 minute interval check-ins for mission flights are not always feasible. It is therefore imperative that FAA and/or agency flight plans be filed for point-to-point flights and that the resource tracking check-in/check-out system be strictly implemented.

1. **Point-to-Point Flight.** Check-ins shall be made at 60 minute intervals (maximum) and at every fuel stop.
2. **Mission Flight.** Check-ins shall be made as follows:
   - Unless alternative flight following intervals have been identified in advance for areas of incomplete coverage or valid mission requirements, check-ins at intervals not to exceed fifteen (15) minutes are the standard.
   - Prior to and immediately after landing. If it is anticipated that terrain will interfere with check-in at the landing site, call in while still at altitude, giving a reasonable estimate of on ground time. Helicopter managers and Pilots should be aware that the dispatcher will expect a check-in at the end of the on ground time identified.
   - Prior to and immediately after takeoff. The takeoff check-in should be made as soon as communications can be established.

> EXEMPTION: Law enforcement personnel on sensitive missions may request an exemption to the above requirements from their unit Aviation Manager. If flight following cannot be performed without compromising mission integrity, a detailed flight plan will be submitted in a sealed envelope to the dispatcher. Check-ins can then be made by referring to nonspecific “points” (for example, Point A, Point B, etc.) that are identifiable only on the flight plan itself. If no mishap occurs, the envelope is returned unopened to law enforcement. If a mishap occurs, the envelope is opened and emergency response procedures are initiated.

F. Check-In Information.

The check-in made by the Helicopter Manager or Pilot for mission flights shall consist of:

- Current location use global positioning system (GPS) latitude/longitude if available; otherwise legal or geographic descriptions are acceptable)
- Current direction of flight
- Next destination or area to be surveyed
- Estimated time on ground (if landing)

G. Failure to Meet Check-In Requirements.

The dispatch or other flight following facility shall immediately initiate emergency response procedures for overdue or missing aircraft.

III. Resource Tracking.

In order to facilitate cost-effective use of aircraft and planning of resources, scheduling offices and ordering offices may request Pilots or the government representative on board an aircraft to relay flight status information at designated intervals. These notifications are performed to coordinate changes in assignments or update time frames for mission completion. They may be performed via radio or phone calls to dispatch offices. The need for and method of resource tracking should be planned and documented on the flight request/plan or resource order. The use of aircraft radios for resource tracking is at the discretion of the Pilot and shall not interfere with air traffic control or the safe operation of the aircraft.

On point-to-point flights, including ferry flights, it is required that the Helicopter Manager or Pilot to make resource tracking check-ins, usually via telephone, at enroute stops and at final destination. Refer to Chart 4-1.

IV. Aircraft Communication Systems.

A. Aircraft VHF-AM Radio.

All agency-owned, contract, and rental aircraft have a VHF-AM radio for communication with FAA facilities. Some VHF-AM radio frequencies are available for incident or project use on either a nationally or regionally assigned basis.

Along with the use of VHF-AM frequencies to perform flight following check-ins with FAA facilities, communication functions of the VHF-AM bandwidth include helicopter takeoff and landing coordination and air-to-air tactics.

With the exception of 122.925[1], these frequencies must be ordered from the local dispatch facility. The order must specify the function for which the frequency is intended (e.g., TOLC, air-to-ground, air-to-air, etc.).

Large helibases with numerous aircraft should have separate frequencies assigned for takeoff and landing control and air-to-air tactics for the entire incident or project. A checkpoint should be established at which the Pilot should change frequencies from air-to-air tactics to TOLC, and vice versa.

---

[1] VHF-AM frequency 122.925 is a frequency designated for use by all natural resource agencies. It may be used on both incidents and projects for air-to-air and air-to-ground communications. The hazard in utilizing this frequency for any extended period of time is that anyone can use it. An incident or project cannot restrict its use by others.

B. Aircraft VHF-FM Radio.

See procurement document for FM radio Requirements.

1. Analog. It is important to know whether the frequency being used is wide-band (25 MHz) or narrow-band (12.5 MHz). Additionally, tones may be used. Both the transmit and receive side of the radio may be tone guarded.
2. P-25 (Digital). Digital and Analog frequencies are not compatible in either transmit or receive mode. Network Access Codes (NAC) function similarly to tones when using digital frequencies.

C. Satellite and Cell Phones.

This equipment may supplement radio communications in some instances. However, their use during flight by the Pilot-in-Command (PIC) should be limited to that necessary for the safety of the flight and its occupants. In-flight phone calls should not be used for leg-by-leg resource tracking, company business or any unnecessary conversations.

> IMPORTANT NOTE – Distractions and workload in the cockpit increase with the use of specialized equipment such as differential GPS navigation systems, Dataloggers, programmable graphic displays and some radio equipment. The Pilot's primary task must be flying the aircraft.

V. Helibase Communications.

There are two major factors to consider regarding helibase communications:

- The system itself, consisting of hardware, frequency assignments, and the location at which communications with aircraft are performed; and,
- The individuals who are responsible for helibase communications.

A good helibase radio communication system, staffed by trained personnel, should result in effective, safe operations.

A. General Considerations.

The following standards should be consistently followed:

- Operations must <u>not</u> be conducted if flight following requirements <u>cannot</u> be maintained.
- Communication between the helibase and helispots is required.
- Helicopters with avionics problems that don't allow positive communications must return to the helibase (or other directed location) and should be shut down until the problem is corrected.

- A review of the Communications Plan shall be conducted during the morning review of the Daily Helicopter Operations Briefing/Debriefing Checklist, ensuring that all helibase personnel and Pilots are aware of frequencies to be used, flight following requirements, and, most importantly, any changes to the Communications Plan since the last shift. A critique of communications should be conducted at the debriefing.

- Frequency changes during a project should be the exception rather than the rule. However, during large, complex incidents, or incidents that are in a transition stage from extended attack to team management, frequency changes may be the rule rather than the exception. Be flexible and ensure that changes are made known to all.

> IMPORTANT NOTE: One of the difficulties air crews experience in contacting an incident is when frequencies have been changed on the incident, but not on the Aircraft Resource Order. It is incumbent that the Air Operations Branch Director or other staff member ensures that dispatchers relay new or changed frequencies and air/ground contacts when ordering additional aircraft for an incident.

- Ensure that problems are brought to the attention of the air operations staff or Project Aviation Manager. The Communication Unit Leader and/or local radio technician are helpful resources in solving communications problems.

B. Organization.

All personnel working at the helibase are affected by how information is exchanged. Communication flow and how it is structured within the helibase organization will differ with each situation, but must be established with and understood by each member of the helibase organization.

The two key positions under the Helibase Manager that directly manage the communication flow are the ABRO and TOLC. See Chapter 2 for a description these positions.

C. Helibase Communications and Flight Following Forms.

The ABRO uses the following forms to accomplish the duties and responsibilities of the position:

- ICS-220, Air Operations Summary, identifies aviation communications frequencies.

- ICS-205, Incident Radio Communications Plan, identifies aviation and other communications frequencies and functions.

- HBM-6, Helibase Mission Request Log, identifies requested missions.

- HBM-5, Helibase Flight Following Log, enables the ABRO to track and identify current location and intended destination of assigned helicopters.

- HJA-4A, Emergency Rescue Information, identifies primary and secondary medevac helicopters in the event of injuries to personnel or in the event of an aircraft mishap.

This becomes part of the Medical Plan.

- HJA-4B, Emergency Medevac Medical Transport Request, allows the ABRO to obtain additional information necessary to respond safely and efficiently to a request for Helicopter Emergency Medical Services (EMS) services.

D. Incident Communications Plan and Frequencies.

Refer to Exhibit 4-2 for an illustration of an aviation communications plan.

There is no standard communication plan that will work in all situations for all agencies during complex helicopter operations. For this reason, the following is a general discussion of helicopter communications in terms of communication functions, requirements, options, and radio discipline. These may be adapted to the specific situation encountered.

On an incident or project, the number of helicopter communication functions is dependent upon the complexity of the situation. One may use any number of these functions to meet the need. Refer to the *NIFC Aircraft Radio and Communications Frequency Guide* and the *Incident Aviation Communications Functions and Frequency Guide* for additional information.

1. Helibase Air Traffic Control. This function is commonly called the TOLC frequency.

   It is used to coordinate departing and arriving air traffic at the helibase with other aircraft, the TOLC and ABRO, the HLCO, the Air Tactical Group Supervisor, and Helispot Managers.

2. Flight Following. This function is usually performed by the ABRO. The HLCO, as well as the Air Tactical Group Supervisor, can be of assistance with this function, particularly when working the helicopters in remote areas of the incident or project out of VHF-AM, line-of-sight range.

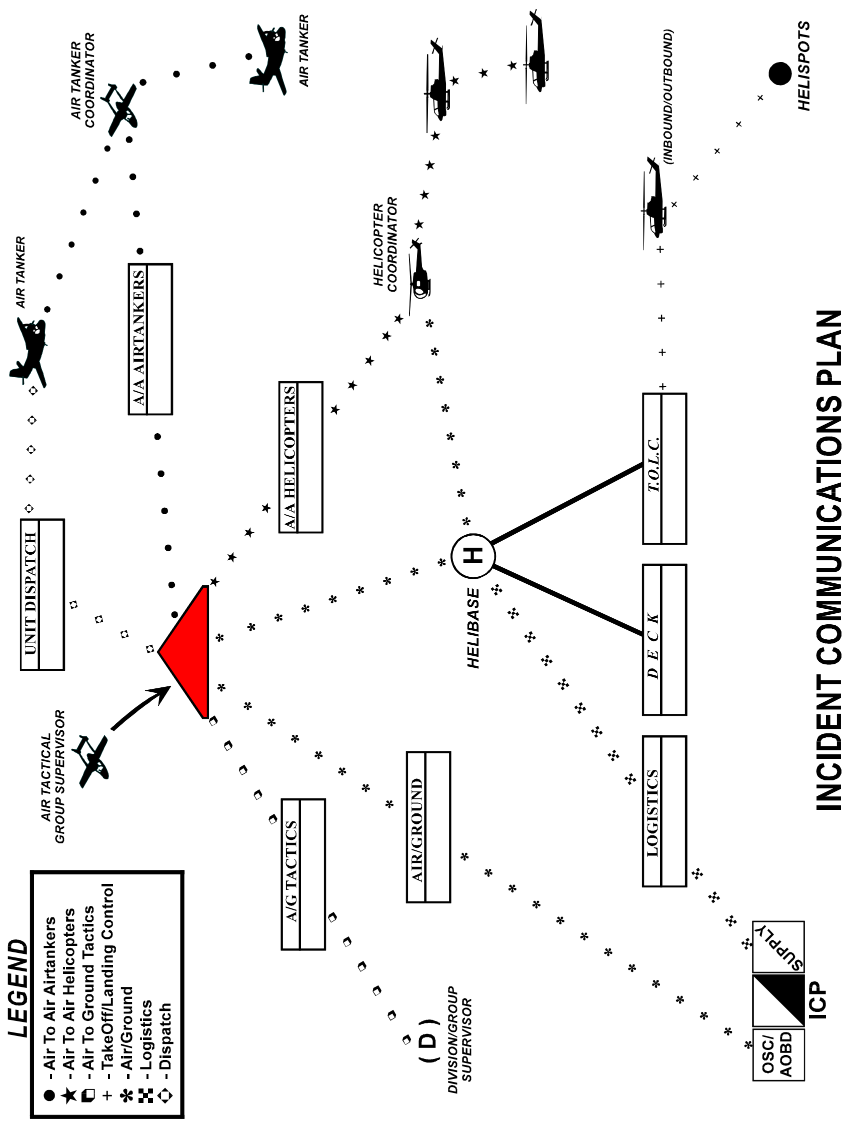
   Remember that a “human repeater” is an effective method of flight following when radio repeaters are unavailable or not working. This function may employ a Ground/Aircraft Radio Link system which translates VHF-AM aircraft transmissions to UHF frequencies via a repeater.

3. Deck Communication and Coordination. Use of a Logistics Net frequency for ground-to-ground deck communications on large helibases can facilitate communications between the Parking Tenders, Loadmasters, DECK, TOLC, and the ABRO.

4. Air-to-Air Tactics. This frequency is used by all aircraft, the HLCO, and the Air Tactical Group Supervisor to coordinate aerial activities. On large incidents or projects, helicopters and airplanes may have separate frequencies.

5. Air-to-Ground Tactics. Several frequencies may be used to coordinate aerial activities with ground activities. Helicopters should have frequency compatibility for this function. If the helicopters do not, the HLCO or Air Tactical Group Supervisor must have compatibility with ground units in order to pass on the information to helicopters via the air-to-air frequency.

Exhibit 4-2 Incident Communications Plan



6. Command. There is usually only one Command frequency assigned, although there may be more than one frequency for this function on large incidents assigned as Air-to-Ground Command. This function is used to link the Incident Commander or Project Aviation Manager, air operations staff members, and the Air Tactical Group Supervisor. Its use should be strictly limited to overhead communications and should not be used for other traffic except in an emergency.
7. Support/Logistics. This function is for supply and support requests, status keeping, and general non-tactical, non-command information. The ABRO can be the central point for relaying information that falls within this broad function.
8. Air Guard. Air Guard is a national frequency with specific designated uses: emergency contacts, initial contact at an incident by inbound aircraft, and long-range dispatch or rerouting. At no time should Air Guard be an assigned frequency, nor should it be used if other frequencies become overloaded.

E. Communication Requirements and Options.

1. Frequency Compatibility. It is essential that all aircraft and ground personnel have compatible radios and frequencies in order to perform necessary communication functions.
2. Radio Traffic and Radio Discipline. Radio traffic must be disciplined and concise. If problems are encountered with overloaded radio frequencies, first examine whether radio discipline is being practiced. If not, take corrective action with Pilots, aircraft managers, and helibase personnel. If the frequencies remain overloaded, then an additional frequency or frequencies may be needed.

   Remember that at no time shall the Air Guard frequency be used for any function other than its intended uses.

   Use the following guidelines in managing radio traffic.

   - Agency requirements for sterile cockpit procedures shall be followed.
   - Use clear text on all operations. See Exhibit 4-3.
   - Keep messages brief and to the point.
   - If the message is long, stop the transmission periodically to allow for emergency or other short messages to be transmitted.
   - If a frequency has been designated for a specific function, do not allow radio traffic unrelated to this function on the frequency.
   - On the takeoff and landing control frequency, encourage Pilots to actively participate in aircraft coordination on inbound and outbound routes. If the TOLC tries to coordinate all air traffic, the Pilots may be lulled into relying on the position excessively. Remember that the basic tenet of VFR flight is “see and avoid.”

- If an individual (for example, the ABRO or TOLC) will be off the frequency or out of the area temporarily, ensure that all Pilots who might try to communicate with that function are aware of the out-of-service condition. Remember that the flight following function must always be staffed when aircraft for which it is responsible are airborne.

- Establish standard procedures for where and/or when helicopters contact the TOLC and ABRO.

- When making a radio call, identify the radio or frequency on which the message is being transmitted. Since Pilots and ground personnel are monitoring more than one frequency, this will enable them to identify which radio or frequency to use to respond. For example: "Blues Helibase, Helicopter 68X on Victor[2]. Send an additional Type 2 Helicopter with bucket to Division B."

- Never use frequencies without prior authorization. Switching to an apparently unused frequency may have serious consequences for FAA air traffic control, other adjacent incidents, etc.

3. Frequency Monitoring. Pilots can usually monitor only two frequencies effectively.

   Experience has proven that the fewer the frequencies that need monitoring and fewer the people from whom the Pilot is receiving direction, the better the Pilot will function. Their understanding will increase and fatigue factors will be reduced.

   For this reason, it is essential that the HLCO, Air Tactical Group Supervisor, ABRO, and TOLC monitor all incoming radio traffic directed toward the airborne helicopter operation.

4. Switching from One Frequency to Another. The necessity to manually switch frequencies affects the Pilot. Due to the normally short turnaround times of helicopter missions, frequency changes are a source of distraction and increase the already heavy workload.

   To relieve this, Pilots should be required to monitor only one primary frequency at a time, with a secondary as a backup.

5. New or Changed Frequencies. If a new frequency is necessary, or frequencies are changed, coordination between the aviation management positions is essential in getting new information to all ground and air personnel. Frequency additions, changes, and deletions should be coordinated through the Communication Unit Leader. A specific time for the changeover to occur should be established to avoid confusion.

   If at all possible, avoid switching frequencies and their functions in the middle of a shift.

6. Combine Functions. On smaller incidents, communication functions can be combined. A common method is to combine helicopter air traffic control, air-to-air traffic control, air-to-air tactics, and flight following on one frequency. Command, air-to- ground tactics, and support are often combined on another frequency.

[2] "Victor" is an abbreviation for VHF-AM Radio, as opposed to VHF-FM, which may be identified as "Fox-Mike."

The biggest drawback to combining functions is the resultant increase in radio traffic on each frequency, making this option usually usable only on smaller, less complex incidents or projects.

7. Issuing Air Traffic Information and Advisories. Safety is dependent upon adequate air traffic information and advisories being given, and that the information is received and acknowledged. Remember that interpretation can vary. Monitor radio traffic for compliance and ask the Pilot to repeat if uncertain.

   Additionally, remember that only certified FAA Air Traffic Controllers can issue "clearances" and "control" the airspace. The function of TOLC and ABRO is to provide information, advisories, and coordination of inbound and outbound aircraft around the helibase.

   In most situations, Pilots need to know the following:

   - Which helicopters are affected
   - Identification of unit issuing the advisory
   - What type of traffic (helicopter, fixed-wing, etc.)
   - What traffic is doing
   - Location of traffic
   - Direction of travel
   - Type, direction, and altitude of pattern; note that traffic pattern direction must change if wind changes
   - Recommendations

   Request acknowledgment from each aircraft. This is critical for safety. Pilots may not receive the information due to being involved in radio traffic on other frequencies, their location, and helicopter noise.

   > EXAMPLE: Consider a sample traffic coordination advisory from the Air Tactical Group Supervisor on the Blues Incident:
   >
   > "All Blues Incident helicopters, Blues Air Tactical, air tankers will be dropping on the ridge running north-south west of Helispot 7. Drops will be from south to north, clockwise pattern. Stay below 4000 feet on the north and east sides of the incident until further notice. Acknowledge."

   Pass on new information. It is important that the ABRO and/or TOLC and the aircraft on the incident or project relay new information to each other. This is critical on complex operations when there are separate frequencies for air-to-air and helicopter air traffic coordination.

> Once the previous message was acknowledged by all airborne helicopter Pilots, the Air Tactical Group Supervisor should contact the helibase(s) to ensure that no missions are launched to the area of air tanker operations.
>
> "Blues Helibase, Blues Air Tactics, air tankers will be dropping on the ridge that runs north-south to the west of Helispot 7. Drops will be from south to north, clockwise pattern. Helicopters have been instructed to stay below 4000 feet on the north and east sides of the incident until further notice. Acknowledge."

8. **Special Operations.** During special operations such as helitorch, plastic sphere dispenser, or rappel, discrete frequencies are often assigned to avoid interference from other operations. In all cases, consult the Communications Unit Leader or local agency communications specialist before using any frequency. Radio signals sometimes "pair up" to produce a signal on a third frequency which may interfere with other services.

Exhibit 4-3 TOLC/ABRO Advisories to Pilots

WHEN HELICOPTER CONTACTS HELIBASE

HELICOPTER # _______, ____________________ HELIBASE

1. WINDS ARE ______ MPH FROM THE ______________.
2. (*EITHER*) A. THERE IS NO REPORTED TRAFFIC.
   (*OR*) B. ____ (*LIST AIRCRAFT*) IS OUTBOUND FROM _____ TO _______
   (*AND/OR*) C. ____ (*LIST AIRCRAFT*) IS INBOUND FROM _______ TO _______
3. BE ADVISED OF ________________ (LIST PERTINENT AIRSPACE ACTIVITY)
4. LAND AT PAD ________.

BEFORE A HELICOPTER DEPARTS HELIBASE

HELICOPTER # _______, ___________________ HELIBASE, ON ___________

1. WINDS ARE _______MPH FROM THE ______________.
2. (*EITHER*) A. THERE IS NO REPORTED TRAFFIC.
   (*OR*) B. _____ (*LIST AIRCRAFT*) IS OUTBOUND FROM _____ TO ______
   (*AND/OR*) C. _____ (*LIST AIRCRAFT*) IS INBOUND FROM _______ TO ______
3. BE ADVISED OF ________________ (LIST PERTINENT AIRSPACE ACTIVITY)
4. DEPART AT YOUR DISCRETION.

EXAMPLE: **Helicopter 5NR, Side Lake Helibase on Victor**
Winds are 5 miles per hour from the west
Helicopter 0PA is outbound from the Helibase to H-1
Be advised of troop shuttle activity from the Helibase to H-1
and air tanker activity in Division A
Depart at your discretion

CHAPTER 5: VENDOR PERSONNEL AND EQUIPMENT: APPROVAL AND CARDING.

I. Introduction.

The OAS and USFS inspect and approve personnel and equipment for interagency use.

With the exception of life-threatening situations or undercover law enforcement missions, personnel shall not fly with Pilots or in aircraft that have not been approved.

II. Approval and Documentation Process.

Interagency Carding - Both agencies use:

- Interagency Pilot Qualification Cards
- Helicopter Data Cards
- Helicopter Service Truck Data Cards
- There are differences in the way agencies issue approval for mechanics

Although DOI and USFS accept and use each other's carded aircraft and pilots, it is important to ensure your agency has a procurement agreement with the operator of the aircraft or an interagency agreement with another government agency before using an aircraft.

Government inspectors complete annual inspections of the aircraft, pilots, mechanics, fuel service vehicles and equipment. The cards may be issued for up to 12 months from the date of inspection. Extensions may be granted on a case-by-case basis.

Interagency Cooperator Approvals – Cooperating aircraft and pilots may be inspected and approved for transporting Federal employees and/or working on interagency projects or fires. Letters of Approval must be approved annually by the USFS, Regional Aviation Officer or the OAS Regional Director.

A discussion of use of other-government, military, and cooperator (civil) aircraft is contained in Chapter 3. Use of these aircraft requires agency approval. These aircraft and pilots will not necessarily be carded, but must have documentation of approval for use.

Most state and local agencies have a carding and approval process. They may also accept USFS or OAS carding. In certain cases, USFS and OAS accept state agency cards. Documentation and review of these approvals is mandatory prior to use.

III. Interagency and Procurement Document Standards.

Minimum equipment and pilot standards have been adopted for interagency helicopter operations. These standards are incorporated into procurement documents. Some procurement documents require additional equipment and/or pilot standards.

Aircraft and pilots may be approved for interagency use if they:

- Meet Interagency Fire Helicopter Standards (Reference current, approved document)
- Meet standards set forth in their procurement document
- Possess a current interagency helicopter pilot qualification card or letter of approval

IV. Responsibility for Checking Carding or Approval Prior To Use.

The requirement in Chapter 3, Operational Planning, that Dispatchers or Aviation Managers verify carding during the scheduling process does not relieve the Helicopter Manager, Project Flight Manager, or other on-scene supervisor from the responsibility for checking both Pilot and aircraft cards prior to flight.

If any discrepancy is found during this process the flight shall not proceed and the helicopter manager shall call the scheduling office immediately.

V. Pilot Qualification Card.

Pilots are carded separately for airplane and helicopter operations. To be carded for special use missions, the Pilot may be required to meet additional qualification requirements (for example, a specified number of hours in the low-level flight environment). See Exhibits 5-1 and 5-2.

The Pilot must have a current interagency card showing qualifications for the mission to be performed.

Field personnel, including the Contracting Officer's Administrative Representative (COAR)/ COR or PI, do not have the authority to suspend or revoke a Pilot's card. Only the agency contracting officer or other agency-designated official may suspend or revoke the card.

Each qualification card has an expiration date which is the primary criteria for use of that Pilot. However, this is not the only check necessary.

If the Pilot is to be used for a special use mission, then that use must be noted with the inspector's initial on the reverse of the card.

Exhibit 5-1 and Exhibit 5-2: Example of Interagency Helicopter Pilot Qualification Card

USDA / USDI
HELICOPTER PILOT
QUALIFICATION CARD

Pilot Name: ______

Company: ______

Authorized Aircraft: ______

Expiration Date: ______

Pilot Name
Flight Evaluation Completed
Approved | Mission | Date Expires | Initials | DOI | USFS

CARD STATUS

Interagency ( ) DOI Only ( ) USFS Only ( )

Initial ( ) Renewal ( ) Re-Issue ( ) Added Skill ( )

Inspector Comments: ______

Issued By: ______

Issue Date ______

VI. Helicopter Data Card.

The aircraft shall have a current interagency card showing that the aircraft has been inspected and approved for the mission(s) to be performed. Remember that use of other-government, military, and cooperator (civil) aircraft requires agency approval, but the aircraft may not necessarily be carded. See Exhibit 5-3.

Exhibit 5-3: Example of Interagency Helicopter Data Card

OMB No. 0596-0015

USDA – Forest Service HELICOPTER DATA RECORD (Reference FSH 5709.16)	1. Contract/Rental Agreement No. 2. Item No. 3. Designated Base 4. Region/ Area

SECTION I - Operator & Helicopter Information (Fill in Blanks)					
1. Operator	2. Address (Street, City, State & ZIP Code)				
3. Phone No.	4. Make/Model	5. FAA Registration	6. Manufacturer's Serial No.	7. Hobbs Reading	
8. Max Cert Gross Weight (Internal)	9. Max Cert Gross Weight (External)	10. No. of Passengers	11. Type Fuel	12. Fuel Flow (Cruise) G.P.H.	
FOR EQUIPPED WEIGHT SEE CURRENT WEIGHT AND BALANCE DATA					

13. Authorized Uses (X appropriate boxes) Expires (Fill in the blank): ______

a. [ ] Passenger & Cargo	h. [ ] Fire Suppression – Interagency	o. [ ] Approved for Left Seat Ops
b. [ ] Low-Level Reconnaissance	i. [ ] Fire Suppression – Local	p. [ ] Manager May Ride Point-to-Point
c. [ ] Cargo Only	j. [ ] Water/Retardant Bucket	q. [ ] Approved MEL
d. [ ] External Load (Sling)	k. [ ] Helitanker (Fixed Tank)	r. [ ] Other ______
e. [ ] Rappelling	l. [ ] Longline/Remote Hook	s. [ ] Other ______
f. [ ] Aerial Ignition	m. [ ] Rapid Refuel (CCR or Splash) ______	t. [ ] Other ______
g. [ ] Synthetic Longline S/N	n. [ ] Air Attack (Type ______)	u. [ ] Other ______

14. Approved By (Signature)	15. Title	16. Region/Area	17. Date

FS5700-21a (01/05)

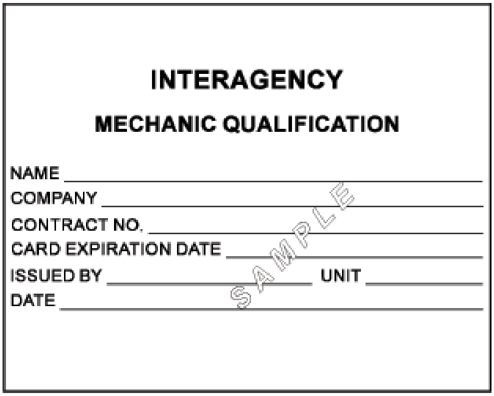
VII. Mechanic Qualification Card.

The mechanic shall have a current FAA mechanic certificate with airframe and power plant ratings. OAS and USFS policies differ regarding carding of mechanics.

A. USFS Procedure.

Mechanics on USFS exclusive-use and CWN procurement agreements shall have a Mechanic's Qualification Card. See Exhibits 5-4 and 5-5.

Exhibit 5-4: Mechanic Qualification Card (FRONT)



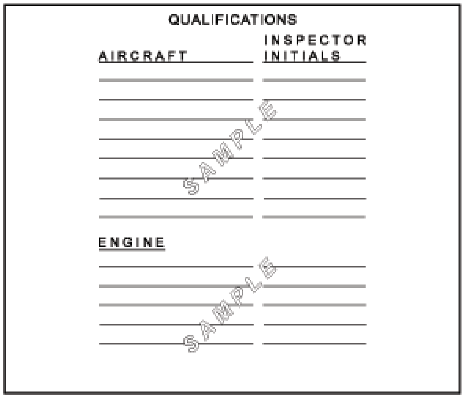
INTERAGENCY

MECHANIC QUALIFICATION

NAME ____________________
COMPANY ____________________
CONTRACT NO. ____________________
CARD EXPIRATION DATE ____________________
ISSUED BY ____________ UNIT ____________
DATE ____________________

SAMPLE

Exhibit 5-5: Mechanic Qualification Card (REVERSE)



QUALIFICATIONS

AIRCRAFT	INSPECTOR INITIALS

ENGINE

SAMPLE

B. OAS Procedure.

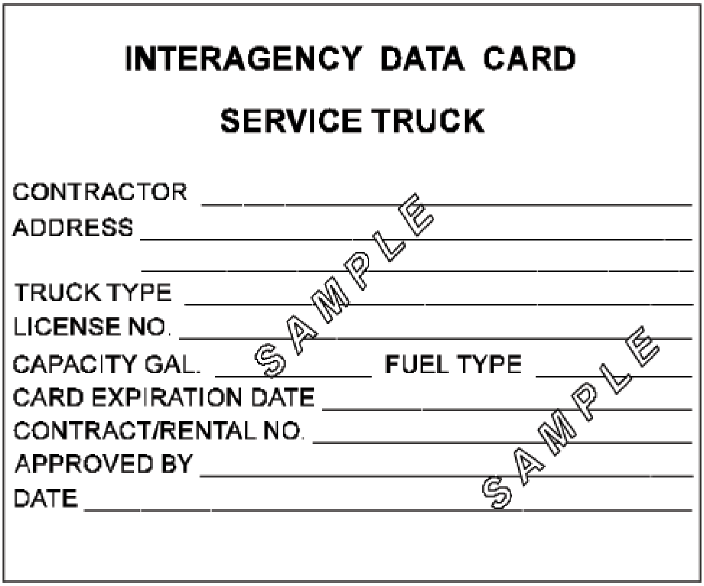
Mechanics on OAS exclusive-use procurement agreements are approved by name on an OAS-68 Inspection Report. Depending upon whether or not they have also been approved on a USFS contract, they may or may not possess a Mechanic's Card. The lack of a card does <u>not</u> preclude the mechanic from functioning as such on a USFS incident, provided the aircraft is operating under an OAS procurement agreement.

VIII. Service Truck Data Card.

For interagency fire helicopters, helicopter service trucks operating under procurement agreement are inspected and carded by OAS and USFS. The inspection sticker should be located on or in the vehicle in a conspicuous location. It is the Helicopter Manager's or Flight Manager's responsibility to ensure that the service truck has a valid, current inspection sticker. See Chapter 13 for further information. Per the procurement document, the fuel truck driver should perform daily and weekly checks on fuel quality, using vendor formats See Exhibit 5-6 and Appendix B.

Exhibit 5-6: Example of Interagency Helicopter

Service Truck Data Card


INTERAGENCY DATA CARD

SERVICE TRUCK

CONTRACTOR ______________________

ADDRESS ______________________

____

TRUCK TYPE ______________________

LICENSE NO. ______________________

CAPACITY GAL. __________ FUEL TYPE __________

CARD EXPIRATION DATE ______________________

CONTRACT/RENTAL NO. ______________________

APPROVED BY ______________________

DATE ______________________

SAMPLE

SAMPLE

IX. Aircraft Fuel Facility Inspection and Carding.

Helicopter fuel facilities operated by the government, or those for which a vendor is responsible but which are located on government lands, shall be inspected regularly by DOI bureaus or USFS using Form HCM-3, Aircraft Fuel Facility Inspection Log. See Appendix A and Chapter 13.

Depending on agency policy, an inspection sticker for the facility may be issued. The sticker should be located in an area secure from the elements. A copy of the inspection shall also be maintained by the local unit responsible for the facility.

CHAPTER 6: HELICOPTER CAPABILITIES AND LIMITATIONS.

I. Introduction.

It is essential that non-Pilot users of helicopters gain at least a rudimentary knowledge of helicopter capabilities and limitations. The brief summary in this chapter should be supplemented by basic helicopter safety training that provides further specific information concerning helicopter limitations and operating characteristics. Users are encouraged to extend this knowledge further by engaging in conversations with the individual most qualified to answer- the Pilot.

IMPORTANT NOTE: On any flight, the PIC is responsible for the safety of the aircraft and its occupants.

The user needs to become familiar with a number of terms in this section. Refer to the glossary for definitions. These terms include:

- Pressure altitude
- Density altitude
- Weight and balance
- Center of gravity
- Hover Ceiling-In-Ground Effect (HIGE)
- Hover Ceiling-Out-Of-Ground Effect (HOGE)
- Maximum certificated gross weight
- Hover ceiling
- Maximum computed gross weight
- Weight reduction
- Takeoff and landing limitations
- Equipped weight
- Operating weight
- Allowable payload
- Fuel consumption/capacity
- Cruise speed

For a basic explanation of the principles of helicopter flight, capabilities, and limitations, the user may want to refer to FAA Advisory Circular AC 61-13B, *Basic Helicopter Handbook*.

II. Helicopter Performance and Selection.

In order to safely and successfully complete a mission, the helicopter must be capable of meeting the performance required. Allowable payload, hover ceiling, airspeed, and fuel requirements need to be considered in selecting the proper aircraft.

Chapter 7 and Appendix A address the specifics of the helicopter load calculation form, which is the primary planning tool for determining if the helicopter is capable of lifting a load at a given temperature and elevation.

Chart 6-1 summarizes the minimum specifications for the typing of helicopters by allowable payload, number of passenger seats, and water or retardant carrying capability. When a helicopter is referred to by type, for example, as a Type 2 helicopter, it must have met the minimum specifications outlined in the chart for a Type 2 helicopter.

Chart 6-1: ICS Type Specifications For Helicopters

TYPE	1	2	3
Useful Load @ 59° F. @ Sea Level	5000	2500	1200
Passenger Seats	15 or more	9-14	4-8
Retardant or Water Carrying Capability (Gallons)	700	300	100
Maximum Gross Takeoff/Landing Weight (Lbs)	12,501+	6,000-12,500	Up to 6000

III. Weight and Balance.

Weight and balance information is kept in each aircraft flight manual or weight and balance book. This information includes:

- Equipped weight of aircraft, as configured.
- Passenger configuration(s).
- Cargo weight and distribution limits.
- Center of gravity (CG) limits, as configured.
- Maximum takeoff and landing limits.
- Charts for computing weights and CG location.

IV. Day/Night Flight Limitations.

A. Day Visual Flight Rules (VFR) Only.

Except as noted below, <u>or</u> for reasons of life-or-death emergency, single-engine helicopters shall be limited to flight during daylight hours and only under VFR conditions (minimum ½ mile visibility). Daylight hours are defined as 30 minutes before official sunrise until 30 minutes after official sunset or, in Alaska, during extended twilight hours when the terrain features are readily distinguishable for a distance of at least one mile.

> CAUTION: In mountainous or hilly terrain, compounded by the aspect of the terrain in relationship to the sun's position, one may experience late dawn or early dusk conditions. Flight periods should be adjusted accordingly. Daylight hours may be further limited at the discretion of the Pilot or Helicopter Manager by conditions of visibility caused by smoke, shadows, etc.

B. Authorization for Night Flying Operations.

Night operations are unique and require agency authorizations.

1. Weather Minimums for Night Operations. The following operational weather minimums are required for normal night operations (FAR 91.155) and recommended for helicopters performing life-or-death emergency night operations.
   a. Night in Class G airspace 1,200 feet or less above the surface:
      - Three (3) statute miles flight visibility;
      - Distance from clouds:
        - 500 feet below
        - 1,000 feet above
        - 2,000 feet horizontal.

   b. Night in Class G airspace more than 1,200 feet above the surface but less than 10,000 feet MSL:
      - Three (3) statute miles flight visibility;
      - Distance from clouds:
        - 500 feet below
        - 1,000 feet above
        - 2,000 feet horizontal.

2. Tactical Operations. Multi-engine helicopters may fly during nighttime hours provided they are equipped with approved night vision goggle (NVG) capability and the Pilots have been approved for NVG operations. NVG helicopter operations must be conducted within NVG operational guidelines.

3. Logistical Operations. Pilots may operate at night under the following conditions:

   a. Agency and Contract Pilots may, with agency specific approval, solo Pilot single engine helicopters at night for ferry and maintenance purposes. Transportation of passengers at night in a single engine helicopter is prohibited.

   b. Agency and Contract Pilots may, with agency specific approval, fly twin engine helicopters at night for ferry, transportation of passengers, and maintenance purposes.

   c. Conduct all night helicopter operations, other than NVG operations, in one of the following ways:

      - To and from airports and heliports having FAA approved lighting.
      - To and from airports and helibases approved by the Regional or State Aviation Manager.

4. Emergency Operations. The principles and procedures of risk management and analysis outlined in Chapter 3 shall be applied to any decision regarding conducting a nighttime emergency operation, particularly those conducted in adverse conditions of fog, mountainous terrain, etc.

   - Pilot-in-Command Authority. For single engine and twin engine night operations under emergency life-or-death criteria, final authority for the safety of the flight resides with the Pilot.

V. Instrument Flight Rules (IFR) Flight Limitations.

IFR operations are authorized when aircraft and Pilot(s) are approved and carded. Flights into IFR conditions shall be conducted only:

- In a multi-engine helicopter certificated for IFR operations, and
- When weather minimums meet or exceed those prescribed in 14 CFR 135 for helicopter IFR operations.

VI. Wind Restrictions.

The capability to fly a helicopter in excessive wind conditions varies considerably with the weight class of the helicopter and the degree of turbulence associated with the wind. If the helicopter flight manual or the helicopter operator’s policy does not set lower limits, the following shall be used. These limits may be further restricted at the discretion of the Pilot or other air operations personnel. See Chart 6-2.

A. Flight Above 500' AGL.

Flights more than 500 feet above the surface are allowed in winds up to 50 knots for all types of helicopters.

B. Flight Below 500' AGL.

1. Type 1 (Heavy) and Type 2 (Medium) Helicopters. Steady winds shall not exceed 40 knots or a maximum gust spread of 15 knots.
2. Type 3 (Light) Helicopters. Steady winds shall not exceed 30 knots or a maximum gust spread of 15 knots.

Chart 6-2: Wind Restrictions For Types 1-3 Helicopters

FLIGHT ABOVE GROUND LEVEL	FLIGHT PERMITTED IN WINDS LESS THAN / MAXIMUM GUST SPREAD (in knots)		
	TYPE 1	TYPE 2	TYPE 3
MORE THAN 500' AGL	50 / NA	50 / NA	50 / NA
LESS THAN 500' AGL	40 / 15	40 / 15	30 / 15

VII. Helicopter Operations in Snow-Covered Areas.

Helicopters may have manufacturer limitations for operating in falling or blowing snow and could require additional equipment to be installed such as engine snow baffles, auto-re-ignition, engine filtration, etc. “Bear paws” or “full length skis” are needed in deep snow. The aircraft flight manual must be reviewed to determine specific requirements and/or limitations. Regardless of snow depth, extra caution is required when operating in areas of freshly fallen snow due to possible whiteout conditions, created by the rotor wash, which could result in the loss of positional awareness.

Special pilot techniques are required for safe operations when landing in 36 inches or more of undisturbed or crusted snow (not hard packed) in most light and medium helicopters that are equipped with high skid gear. Snow depths that are substantially less than 36 inches may require special pilot techniques when operations are conducted in models equipped with standard (low) height skid gear. Failure to use special operating techniques can be catastrophic if the tail rotor contacts the snow surface. Dynamic rollover is also possible. In addition, special passenger entry and exit procedures are required when operating in these conditions.

Pilots are required to have a “deep snow” endorsement on their Helicopter Pilot Qualification Card when operating over snow-covered areas where the depth and condition of the snow could pose a threat to safe operation during the takeoff and landing phases of flight. If the snow depth is unknown, but suspected to be in excess of 18 inches deep, the pilot should be approved for deep snow operations.

It is difficult to specify a specific snow depth that defines the need for a deep snow endorsement on a pilot's qualification card. If defined as the snow depth at which the entire weight of the helicopter is supported by snow only and no portion of the skids or wheels contacts the ground, the depth of the snow that may create that landing hazard to a Robinson R-44 may be different for a Sikorsky S-64. In addition, snow consistency may impact the need of a deep snow endorsement. For example, although a pilot may land on 5,000 feet of undisturbed snow on Antarctica's polar cap, he or she would have difficulty having skids penetrate the surface more than a few inches due to hard packed snow, thus not requiring a deep snow endorsement.

To ensure safety, please contact a helicopter inspector pilot if you have questions or concerns.

VIII. Helicopter Flight Over Congested and Densely Populated Areas.

Whether a helicopter may operate over congested and/or densely populated areas pursuant to the Federal Aviation Regulations (FARs) depends on the type of operation being performed. With respect to external load operations, the FAA has determined that such operations are in the public interest and do not pose an undue risk to the public, as long as risk management principles are implemented.

Specifically, the FARs permit an operator to conduct external load operations over congested and densely populated areas provided the following conditions are met. Each flight must be conducted at an altitude, and on a route, that will allow a jettisonable external load to be released, and the rotorcraft landed, in an emergency without hazard to persons or property on the surface. However, in the event of an emergency involving the safety of persons or property, a certificate holder may deviate from the rules of this part to the extent required to meet that emergency.

Densely populated areas are those areas of a city, town or settlement that contain a large number of structures or a large gathering of persons, such as on a beach, air show, sporting event or roadway. Helicopters may conduct external load operations over roadways as long as the pilot is able to remain clear of non-participating personnel Mitigations may include:

- See and avoid
- Traffic control using road guards (coordinate with appropriate authorities)
- Closure of road

Ensure that areas for load jettisoning, emergency landings, ingress and egress routes and a means to reduce the threat to the nonparticipating public are communicated. The last item is most important since the presence of a helicopter conducting an external load operation is likely to draw spectators and other unnecessary personnel to the scene.

IX. High Elevation Operations.

Supplemental oxygen may be required when operating above 10,000 feet for more than 30 minutes. Consult the procurement document and technical specialists for specific requirements (reference FAR Part 91.211 or Part 135.89).

X. Lockdown of Controls.

Specific direction may be provided by the procurement document regarding the lockdown of controls. In general, when trained ground or aircrew personnel are available to assist in loading and unloading, the Pilot should remain at the controls when the rotors are turning.

When these personnel are not available to assist, whenever practical, the aircraft should be shut down and rotors stopped prior to departure of passengers and Pilot.

It is recognized that there are certain situations when personnel are not available and which may require the Pilot to lockdown the controls (flight idle with controls locked). An example is the Pilot needing to check that the doors are secure. In these cases, if allowed in the approved flight manual, the Pilot may lock down the controls, but should not leave the area of the rotor arc.

XI. Military Helicopter Limitations.

The use of military aircraft shall comply with the requirements established in the *Military Use Handbook.* Military helicopters and flight crews, including National Guard and Coast Guard, must be agency approved by letter or card. A copy of this letter must be available.

Military performance planning cards (PPC) may be used, at the discretion of military Pilots, in lieu of the load calculation format.

Helicopter management personnel should be aware that military radios may not be compatible with operation radios and should be checked prior to use.

Military helicopters might not be configured to carry cargo. If they are, use military external load equipment, provided it meets military safety standards.

For further information, refer to the *Military Use Handbook* or local agreements with military authorities such as the National Guard.

CHAPTER 7: HELICOPTER LOAD CALCULATIONS AND MANIFESTS.

I. Introduction.

Helicopter 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 is to be operated. When using military helicopters, a similar load calculation system such as the PPC method is authorized.

See Appendix A for examples of standard load calculation and manifest forms, along with instructions for completion. The user needs to become familiar with a number of terms in this section. Refer to the Glossary for definitions. These terms include:

- Pressure altitude
- Weight and balance
- HIGE
- Maximum certificated gross weight
- Maximum computed gross weight
- Gross weight limitations
- Operating weight
- Useful load
- Fuel consumption
- Density altitude
- Center of gravity
- HOGE
- Hover ceiling
- Weight reduction
- Equipped weight
- Allowable payload
- Cruise speed
- Fuel capacity

For a basic explanation of the principles of helicopter flight, capabilities, and limitations, the user may want to refer to FAA Advisory Circular AC 61-13B, *Basic Helicopter Handbook.*

Important points to remember include:

- Environmental conditions aside from those of temperature and altitude may affect allowable payload. One example is the effect of wind on certain Bell models. Some performance charts are designed for no-wind conditions.
- Performance charts are predicated on the helicopter engine(s) meeting the engine manufacturer's specific torque values as determined by periodic power assurance checks.
- Errors, high or low, may result when plotting the maximum computed gross weight on the helicopter performance chart. Use of copier-enlarged copies of charts is recommended to reduce errors.

- Structural limitations (takeoff and landing limitations) such as maximum skid weight, as opposed to performance limitations, may cause confusion. Ensure that personnel are trained in the difference between these types of limitations.

A. Agencies Not Using the Load Calculation Form.

When aircraft from agencies which do not use the form are operating on an incident or project managed by an agency for which the form is required, then the load calculation shall be used for all helicopters operating on the incident or project.

Conversely, when helicopters from an agency requiring its use are operating on incidents managed by an agency which does not require the load calculation, the load calculation form shall be used for all helicopters operated by or under the control of agencies requiring its use.

Furthermore, agency personnel for whom use of the load calculation is required may not ride aboard helicopters managed or controlled by agencies not using the load calculation.

B. Cooperator (Civil) and Other-Government Agency Helicopters.

When employees from agencies that mandate use of the load calculation form are riding on civil, corporate or other-government agency aircraft in non-revenue status, the form shall be used.

C. Military Helicopters.

Standard military methods for determining performance such as the PPC may be used. For aviation operations using Active Duty/Reserve Military helicopters, and National Guard units officially federalized by the Department of Defense, refer to Chapter 70 of the *Military Use Handbook* for specific policy and procedural information.

The use of National Guard units for federal firefighting purposes within their state must be outlined in national, regional, state or local agreements and MOUs between federal agencies and the specific National Guard units.

D. Restricted Category or Limited Use Helicopters.

Load calculations shall be completed for all flights. The same rules apply as those for standard category helicopters regarding omitting the weight reduction for external, jettisonable loads, provided the Pilot concurs.

II. Responsibility for Completion of Load Calculations.

A. Pilot.

- It is the Pilot's responsibility to complete the load calculation form correctly, using proper performance charts.
- The Pilot is responsible for computing the allowable payload.
- The Pilot shall check or be informed of any subsequent passenger/cargo manifested weights completed under the initial load calculation to ensure allowable payloads are not exceeded.

IMPORTANT NOTE: The government representative should participate in the completion of load calculations. However, the Pilot is ultimately responsible for content accuracy.

B. Government Representative.

The government representative (for example, the Helicopter Manager or Project Flight Manager) is responsible for providing an accurate passenger/cargo manifest weight that does not exceed the allowable payload based on current conditions. The government representative is responsible for checking the load calculation to ensure accuracy and completeness. This information shall be reflected on the Passenger/Cargo Manifest.

C. Mutual Responsibility.

After completion of the form, the Pilot and government representative shall sign the form.

III. Determining Load Capability Using Appropriate HIGE/ HOGE Aircraft Performance Charts.

A. General Requirement.

With the exception noted for military helicopters, all helicopter flights require a load calculation/performance determination prior to takeoff. Appendix A provides specific instructions for completion of the load calculation and passenger/cargo manifest forms. Automated Helicopter Performance Planning may be used with agency approval.

If an electronic format is used, the form must be printed out in black and white, signed by the Pilot and government representative, and retained.

Appendix A provides instructions for completion of Form HCM-10, Helicopter Load Capability Planning Summary - Multiple Helispots and Fuel Loads. Use of this format is for planning purposes only.

B. Specific Requirements.

1. Frequency of Completion. A new load calculation is completed for each flight or flight leg to determine performance. However, one load calculation is valid between points of similar elevation, temperature, and fuel load, provided the load for each flight leg is manifested. As a minimum, a new load calculation will be completed daily.

2. Requirement for a New Calculation. A new load calculation is required when there is a change of:

   - +/- 5 degrees Celsius in temperature, <u>or</u>
   - +/- 1,000 feet change of altitude, or
   - The Helicopter Operating Weight such as changes to the helicopter equipped weight, flight crew weight or fuel load. A decrease in the fuel load at the same temperature and elevation will, of course, increase allowable payload. A new calculation may be completed to reflect this increase or it may be reflected on the Passenger/Cargo Manifest form.

3. Determining Pressure Altitude. Pressure altitude can be determined by using the aircraft altimeter's Kolsman Window. Adjust it to read 29.92 inches of mercury (HG) and read the pressure altitude directly off the altimeter.

   - For locations where the helicopter or an altimeter setting is not available, altitude can be estimated by using a map, bench mark, signs, etc.

IMPORTANT NOTE: If elevation from a map is used to estimate pressure altitude, actual pressure altitude should be obtained as soon as possible.

4. Determining Temperature. Temperature can be determined by:

   - On-site thermometer
   - Weather stations
   - Fixed-base operators (FBOs) or Flight Service Stations (FSSs)
   - Aircraft Outside Air Temperature (OAT) Gauge. The OAT gauge may show a higher than actual temperature due to direct sunlight and radiant heat.
   - Using the standard adiabatic lapse rate of 2° C (or 3½° F) per 1,000 feet from a known temperature and elevation. This is only accurate if it is a standard day. When an atmospheric inversion exists, temperatures may actually increase at higher elevations.

5. Determining Helicopter Equipped Weight. The helicopter equipped weight is obtained from the Pilot and by checking the aircraft weight and balance form in the approved flight manual.

6. Determining Flight Crew Weight. This is the weight of Pilot(s), plus personal gear and flight gear.

7. Determining Fuel Weight. The actual weight of a gallon of aircraft fuel may vary slightly. For computation purposes, the following weights should be used.

- AvGas = 6.0 pounds/gallon
- JetFuel = 7.0 pounds/gallon

8. Using Fuel Burn. Using the weight of fuel burned off enroute to the landing or hover site is an acceptable method of calculating a helicopter's ability to hover or land at the destination.

   If the helicopter is within limits at the takeoff site, the weight of fuel consumed during the flight can be "added" to the allowable payload by determining the weight of fuel aboard the aircraft when it arrives at the landing/hovering site.

   > CAUTION: Pilots and managers must ensure that the estimate of fuel burn is accurate prior to arrival at the destination.

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

10. Maximum Computed Gross Weight. In order to safely operate a helicopter at varying altitudes and temperatures, the helicopter's performance capability must be determined. This is done by referring to the performance charts provided with most helicopter flight manuals. The Maximum Computed Gross Weight is obtained from the appropriate performance charts.

   A list of the appropriate charts can be obtained from agency aircraft inspectors for all helicopters used by the agency. Helicopter flight manuals often contain many different performance charts. These charts provide HIGE)and HOGE information. Care should be taken to ensure Pilot use of the proper chart(s). Charts differ for:

   - The specific equipment configuration of the helicopter, such as skid height, particle separators on/off, with/without cargo hook or floats, and other equipment configurations;
   - Conditions such as anti-ice on/off, critical wind azimuth, etc;
   - Environmental temperature ranges.

   Current aircraft configuration and temperature range must match with the correct performance chart.

   With agency approval the operator may use computer programs for performance planning in lieu of flight manual performance charts if the FAA has approved them in the company's operating specifications. Reference the procurement document for specific details.

   > CAUTION: Performance enhancement charts (also called "wind charts") that attempt to take advantage of prevailing winds are not authorized.

CAUTION: For the vast majority of our operations, the manufacturer's performance charts provide the needed information. However, in some unusual circumstances such as hot and high conditions, this may not be the case. It is important to understand that an altitude line may not be extended (that is, extrapolated out) to intersect a temperature line in order to complete a load calculation. Such a practice would allow the helicopter to be operated in an area for which the manufacturer has not provided performance information. IF PERFORMANCE CAPABILITY CANNOT BE DETERMINED USING MANUFACTURER DATA, THEN THE MISSION MUST NOT BE FLOWN.

HOGE charts should be used to calculate allowable weight for internal loads when the destination is unknown or is known to be a HOGE site. Ground effect will dissipate over rough, sloped, or vegetated ground. Since there is nothing precise about ground effect, power requirements (load capability estimates) should always be conservative. If the helicopter is inadvertently loaded for HIGE and the landing site requires HOGE capability, the aircraft may settle and possibly crash if the Pilot attempts the landing.

CAUTION: Caution should be used when identifying HIGE helispots/helibases. At a minimum the following considerations must be met prior to committing to landing or taking off IGE. Pilots and flight crew must review load calculations and ensure the environmental parameters are correct. Additionally the crew must be familiar with the criteria in the applicable performance charts for IGE payload. Typical charts are based on a five foot or less hover over smooth, level, flat surfaces and may require low level flight outside the normal safety circle. Lastly, if there is any doubt as to the suitability for IGE operations, the site will be used for Out of Ground Effect (OGE) operations only.

Weight Reduction. The Government Weight Reduction is required for all "non-jettisonable" loads. The Weight Reduction is optional (mutual agreement between Pilot and Helicopter Manager) when carrying jettisonable loads (HOGE-J) where the Pilot has total jettisonable control. The appropriate Weight Reduction value for make and model can be found in the current helicopter procurement document.

NOTE: All internal loads will be downloaded in accordance with the weight reduction chart. For external, jettisonable loads, the government representative may suggest the omission of the fixed-weight reduction. However, the final decision shall be made by the Pilot if he or she decides it would be prudent to do so.

If the weight reduction is omitted for external, jettisonable loads, a load calculation reflecting this shall be completed.

11. Gross Weight Limitations. Enter applicable gross weight limit from Limitations Section of the basic Flight Manual or the appropriate Flight Manual Supplement. This may be Maximum Gross Weight Limit for Take-off and Landing, a Weight/Altitude/Temperature (WAT) limitation or a Maximum Gross Weight Limit for External Load (jettisonable). Limitations may vary for HIGE, HOGE and HOGE-J.

IMPORTANT NOTE: Do not use a limitation (for example, maximum skid weight) when determining the computed gross weight.

12. Alternatives. When conditions at destination landing site are unknown or found to be different. Although HOGE should be used to calculate allowable weight the first time flying into an unknown landing site, in certain instances, particularly for initial attack where fuel and allowable load are pre-calculated each day, environmental conditions at the landing site may be more severe than were estimated on the load calculation.

    Examples include a higher altitude or temperature than was anticipated, or a HOGE instead of a HIGE landing site. Another example is where an inversion exists, and the temperature actually increases instead of decreases at higher elevations. This often results in an over gross weight condition for the intended landing site. Wind speed and direction may also have a detrimental effect on aircraft controllability.

    Takeoffs and landings, as well as external load operations, must never be attempted when the aircraft is not operating within its performance capabilities.

    If an over gross condition is anticipated prior to takeoff or at an intermediate stop, personnel and/or cargo must be offloaded to bring the aircraft to within its performance capabilities.

    There are occasions (for example, fire initial attack dispatches) when a possible over gross condition cannot be determined due to unknown winds and/or site conditions. After it is determined that conditions are such that performance limitations are exceeded, then a more suitable landing site, usually at a lower elevation, must be selected. A portion of the personnel and/or cargo are offloaded at the lower site, with the remaining load then taken to the original destination.

    If a HOGE site is encountered at the destination, and if the aircraft would be in an over gross condition if a landing were attempted at the HOGE site, then either the alternative outlined in the paragraphs above must be chosen, or a HIGE landing site must be found.

13. Managing Helicopter Bucket Payloads. Helicopter bucket operations require attention to ensure that allowable payloads are not exceeded. Allowable bucket payloads must be calculated for current fuel loads and local environmental conditions. Bucket payloads can only be accurately determined if the bucket is filled to adjusted capacity or an on-board load meter is used.

    The following procedures shall be used for all bucket operations:

    - Determine allowable payload using the load calculation method, appropriate HOGE helicopter performance charts and current local temperature and pressure altitude. Since buckets are external jettisonable loads, the weight reduction may be omitted from the load calculation process with Pilot approval.

    The following procedures shall be used for all bucket operations except those using helicopters equipped with electronic helicopter hook load measuring systems (load cells) that provide a cockpit readout of the external load weight and a bucket that is equipped with a gating system that allows partial loading of the bucket:

- At the beginning of the fuel cycle, adjust the bucket capacity so that the actual payload, when the bucket is filled to the adjusted capacity, does not exceed the allowable payload. Use 8.3 pounds per gallon of water. If mixed fire retardants are being delivered by bucket use the appropriate weight per gallon for that mixture. The weight of the empty bucket and any associated suspension hardware (lines, cables, connectors, etc.) must also be included in calculating the actual payload. The calculation of the actual bucket payload must be documented on the load calculation form or separate load manifest.

CAUTION: IF THE HELICOPTER BUCKET PROVIDED BY THE CONTRACTOR CANNOT BE ADJUSTED TO THE ALLOWABLE PAYLOAD FOR CURRENT, LOCAL ENVIRONMENTAL CONDITIONS, BUCKET OPERATIONS MUST NOT BE CONDUCTED. If this situation occurs, consult with the appropriate Contracting Officer to determine contractual ramifications and necessary actions.

- After the bucket has been adjusted so that the actual payload will be within the allowable payload, bucket operations may begin. The Pilot will be directed to fill the bucket to the adjusted capacity each time **(no partial dips for performance planning purposes)**. Thus, the same payload will be carried on each trip. As fuel is burned, the allowable payload will increase but the actual payload will remain constant. If so desired, after a period of time (for example, 30 minutes), the bucket may be readjusted to the new allowable created by fuel burn-off.

CAUTION**:** There are many different manufacturers and designs of helicopter buckets. Capacity adjustments are made in various ways including removing plugs, opening zippers or cinching collapsible/foldable buckets. Capacity at each position or adjustment level should be marked on the bucket. Collapsible buckets with cinch straps should only be adjusted to the marked graduations (such as 90 percent or 80 percent). Attempts to establish intermediate graduations or capacities below the manufacturer’s minimum graduation (such as tying knots) are prohibited as it results in estimated capacities and may interfere with the release mechanism.

IV. Manifests.

A listing of all passengers and cargo being transported is required for each flight. This may be accomplished on the load calculation form or the Interagency Helicopter Passenger/Cargo Manifest. Crews may provide a manifest using their own format and this practice is acceptable as long as the information on the form is accurate and verified.

The manifest must include:

- Full name of each passenger;
- Weight of each passenger and personal gear;
- Weight of additional cargo;
- Destination.

A copy of the manifest must remain at the departure base. If there are no personnel to receive manifests at the departure base and no verbal relay exists, a copy of the manifest must be left in a visible, easily accessible place.

CHAPTER 8: HELICOPTER LANDING AREAS.

I. Introduction.

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

This chapter establishes the requirements and specifications for helibases (permanent or temporary), helispots, and unimproved landing sites. Consult the Glossary for definitions.

To achieve the maximum degree of safety and efficiency in helispot and helibase operations, personnel must be able to anticipate current and future needs, plan effectively to meet those needs, supervise and monitor the operation, and take timely corrective action in response to problems encountered.

Helibase complexity can range from a simple, single-helicopter operation to a complex multiple- helicopter one, with as many as 10-20 aircraft working from an airport or large field. Helispot complexity can range from a location with limited use to a location servicing considerable personnel and/or cargo transport missions.

NOTE: As clarification for when a helispot should be staffed, managed, and operated as a helibase, the general rule, as applied elsewhere in this guide, is that when a site is used for more than one day as an operational base for two or more helicopters, it should be classified and operated as a helibase.

An unimproved landing site becomes a helispot when it is used on a recurring basis for the purpose of transporting personnel and/or cargo to or from the site. It should then be managed, improved to the extent necessary, and supplied with the appropriate equipment.

Helibases and helispots are used for both incident and resource missions. There is little or no difference between a helispot serving as a landing area for wildlife biologists and one being used to transport crews and supplies to the fireline.

Similarly, the helibase that serves as the aerial transportation focal point for a 50,000 acre fire could also have functioned as the helibase for a 200,000 acre aerial seeding project the year previous. Requirements for good planning and emphasis on safety and efficiency in operations remain the same.

Regardless of the size or complexity of an operation, there are sequential and logical steps which must be taken to achieve a safe, efficient operation and accomplish incident or project objectives. Items such as site selection, set-up and layout, operational phases, and demobilization must be considered for any helibase operation to be successful. The versatility of helicopters employed in natural resource operations, coupled with the wide variety of missions, adds to the complexity of helibase and helispot management.

The need to be flexible, as well as to anticipate and plan for most reasonable occurrences and contingencies, cannot be overemphasized.

II. Planning.

Good planning prior to the start of a project or during the initial stages of an incident will contribute to safe, efficient operations. Conversely, poor site selection will hinder the management and adversely affect the safety of the operation. Remember to think and plan ahead for an increase in helicopters, changes in weather conditions such as fog or inversions, and other factors outlined on the Helibase Manager's Reminders List.

Helibases can be relocated, but usually at great inconvenience and temporary disruption of operations. Good planning will prevent this from becoming necessary. However, do not hesitate to relocate if safety and/or efficiency can be improved.

Appendix H, Helibase Manager's Reminders List, Sections I and II, contains specific criteria to consider when selecting a helibase or helispot site.

- Section I should be reviewed during initial helibase site selection.
- Section II should be reviewed whenever a helispot is established.

The selection of an area or areas on which to land the helicopter(s) is an important planning activity. When possible, the Pilot(s) should have input. The following general requirements should always be considered.

- The types of activity and volume of traffic will affect selection, as well as initial and later development of the landing area(s).
- The site should lend itself to economic and environmentally sensitive development to the size which will accommodate the type of helicopters and volume of traffic expected in both the short- and long-term. Anticipate future needs.
- Weather (potential for smoke or fog inversions, winds) plays a significant role in the location of facilities, both short- and long-term.
- Site planning and construction of all sites, both permanent and temporary, shall be in accordance with local agency land management policy.

A. Permanent Helibase.

A careful study should be made of local, state, and federal laws, rules and regulations relating to construction of a permanent helibase. Site selection should provide for adequate approach and departure paths which avoid housing areas, schools, churches, and any other facilities that might be disturbed by low-flying helicopters.

1. **Accommodation for Different Helicopter Types (Sizes).** All permanent facilities should, at a minimum, be built to accommodate one Type 2 (medium) helicopter.

2. **Planning and Construction Specifications.** The planning and construction of permanent helibases shall be according to agency-specific and/or FAA policy and specifications, as well as applicable local, state, and federal regulations.

B. Temporary Helibases and Helispots.

Helibase or helispot construction, especially in wilderness or similarly sensitive areas, can cause a double impact -- the impact of an abrupt or unnatural opening in the landscape, and the impact resulting from cut-faces of stumps and boles of trees or shrubs.

> IMPORTANT NOTE: Remember that safety shall not be compromised. The area should not be considered as a landing site if it cannot be built to safe standards or negative environmental impacts cannot be mitigated. Minimum Impact Suppression Technique (MIST) guidelines should be reviewed prior to wilderness or sensitive area construction.

The following issues should be addressed and actions performed during the planning stage for helibases and helispots.

1. **Initial Planning Actions at an Incident or Project.** Project helibases and helispots can be adequately planned in advance of the project start. Incident helibases and helispots, on the other hand, are established and become operational in a very short time frame. The rapidity of incident response does not, however, relieve the Helibase or Helispot Manager from performing basic planning actions.

   - Upon arrival, the Helibase Manager should gather intelligence by obtaining maps from the dispatch office, talking to local inhabitants, flying a reconnaissance, reading the local aviation plan, etc.
   - Check with the local Resource Advisor to ensure that the sites for the helibase(s) and helispots are acceptable from an environmental standpoint. Factors to consider include, but are not limited to:
     - Impact of construction and aerial activity on threatened and endangered species or on wilderness or similar values.
     - Hazardous materials (fuel) handling.
   - The Helibase Manager should reference Appendix H, Helibase Manager's Reminders List for factors to consider. These include items for both the Helibase Manager and Helispot Manager to review when initially selecting sites. Even though they should be initially considered, a review at timely intervals (for example, every 5-7 days) is also appropriate.
   - Good planning for project operations should preclude poor site selection. The rapidity with which incidents occur sometimes results in a poor site being used initially. If a poor site for either the helibase or a helispot has been selected, do not hesitate to relocate if a better site can be established. Do this immediately

during the initial stages of the transition from initial or extended attack, or prior to the start of the project. Otherwise, unacceptable delays in operational and logistical support, as well as safety hazards, may result.

- Perform an aerial reconnaissance to locate desired helispots. Individuals on this reconnaissance should include the local Resource Advisor, Operations Section Chief (or designee) or Project Aviation Manager, Air Operations Branch Director (or a designee such as the Air Support Group Supervisor or Helibase Manager), and, if possible, the Helispot Manager who will be responsible for constructing the spot. Consider the following:
- Where possible, identify natural openings which could be used as a helibase or helispot with little or no improvements.
- What will be the primary function of a helispot (crew shuttle, cargo transport, or both)? If used for cargo transport only, consider designating the spot for longline/remote hook operations only (referred to as a sling site) in lieu of constructing a helispot.
- If a helispot cannot be constructed due to environmental or other issues, consider designating the spot a sling site.
- Avoid high visitor use areas, especially if construction is necessary.
- Avoid use of schoolyards, parking lots, local parks, etc. unless absolutely necessary and then only if strict security by local authorities can be provided.
- Discuss construction standards relative to the type of helicopters which will be using the helispot. Provide specific instructions (if possible, in writing) for the Helispot Manager assigned. Remember that construction standards shall not be compromised.
- If a high environmental impact is anticipated, examine other potential sites some distance away from the ideal location which would result in lower impact and still accomplish intended incident or project objectives.
- Discuss measures to restore the helispot to as natural a condition as possible. Consult the local Resource Advisor for standards.

> NOTE: Crews should not be allowed to construct helispots unless prior approval and specifications have been provided as outlined in the above procedures.

2. Site Ownership and Approval. It cannot be assumed that any suitable piece of property can be used for a helibase over an extended period of time without first determining ownership. This is often overlooked in the rush to establish a helibase on incidents. It should not happen with the advance planning time available for projects. During the site selection and planning process, site approval issues must be addressed.

   Check that the land being considered, whether it be a meadow, field, airport, or airstrip, is owned by an individual or entity that supports the operation being conducted. Do not assume that the land immediately adjacent to an incident or project area is managed by a government agency.

a. Private Ownership. If the land is owned by an individual or corporation, contact must be established as soon as possible to request permission to continue to use the land. This assumes that initial attack crews have chosen the site as optimal from an operational standpoint and have already established initial helibase operations. Consideration must be given to the following:

- There may be restrictions that the landowner desires. These might include not using certain areas, such as those the landowner planned to irrigate or plow.
- There may be rental costs involved. Refer to the section on Finance Section Chief or local Administrative Officer involvement. A Helicopter Manager, Helibase Manager, or other air operations staff member usually does not have the authority to negotiate rental costs.
- Rehabilitation of the land is often an issue.

b. Public Ownership. If the land is managed by a federal, state, or local agency, the Helibase Manager must coordinate with the agency's Resource Advisor to determine if use of the site is appropriate and any mitigation measures that must be taken.

If the site is owned by a local municipality, contact the local manager or public official.

c. Role of the Finance Section Chief or Local Agency Administrative Officer. The Helibase Manager should immediately coordinate with the Finance Section Chief on incidents or the local administrative officer responsible for the project. The Finance Section Chief or local agency administrative officer should establish an agreement with the landowner that includes the following, at a minimum:

- Cost (if any) for use of the land.
- Any restrictions on use of the land such as keeping fuel trucks away from certain areas, use of soil stabilizers, etc.
- Rehabilitation requirements after the incident has ended or the project is completed.

d. Use of Airports and Airstrips. Use of airports or airstrips requires the permission of the Airport Manager or a responsible agency such as the state Aeronautics Division. In some cases, closure of the airport or airstrip may be necessary. If so, prior and continued coordination and communication with the applicable authority is essential.

Helibases established at airports or airstrips should be located such that both landing areas and approach/departure paths are segregated from airplane operations. It is recommended that a Fixed-Wing Base Manager be ordered to perform this coordination.

3. Helispots. The same considerations addressed above may apply to the use of helispots, especially those that require improvements. The helispot site selection and approval process is addressed elsewhere in this chapter.
4. Water Sources. The same considerations addressed above apply to the location and use of water sources for dipping or bucket/tank fill operations. Do not assume that each pond or lake is managed by the government. Provisions for replenishment of water sources can be made if use of water is an issue. The use of water additives (foam or retardant), as well as invasive aquatic species are additional issues to discuss with agency Resource Advisors and private landowners.

III. Selection of and Specifications for Temporary Helibases, Helispots, and Unimproved Landing Sites.

A. Landings at Unimproved Landing Sites.

The Pilot is responsible for making the decision to use unimproved landing sites. The government representative on board may make a recommendation, but must defer to the Pilot's judgment, even if the Pilot's preferred site is at a distance from that desired. Conversely, the government representative has the option to advise the Pilot that he or she does not feel comfortable landing at a site selected by the Pilot, and may decline to land at the site.

Prior to landing for the first time at an unimproved site, the Pilot shall make a high-level reconnaissance of the area to determine the location of any aerial hazards in the approach or departure path and to determine wind conditions, slope, ground stability, rotor clearances, ground hazards, and size of touchdown area.

NOTE: Use of unimproved landing sites on a recurring basis is discouraged. When logistical and environmental concerns allow, the site should be improved to meet helispot standards. The following is recommended.

The appropriate authority (agency determined) should identify the level of improvement and approve the extended use of unimproved landing areas.

1. Resource users should prepare a Project Aviation Safety Plan.
2. For large fire operations, extended use will be approved by the Air Operations Branch Director or designee.
3. For initial attack operations, the Helicopter Manager must make this determination.

B. Construction and Improvement.

Construction of approach/departure paths for helibases and helispots should conform as closely as possible to the specifications in Exhibit 8-1 and as discussed later in this chapter. It is recognized that the use of a one-way helispot as depicted in Exhibit 8-2 is sometimes unavoidable.

Exhibit 8-1: Example of a Two-Way Helispot

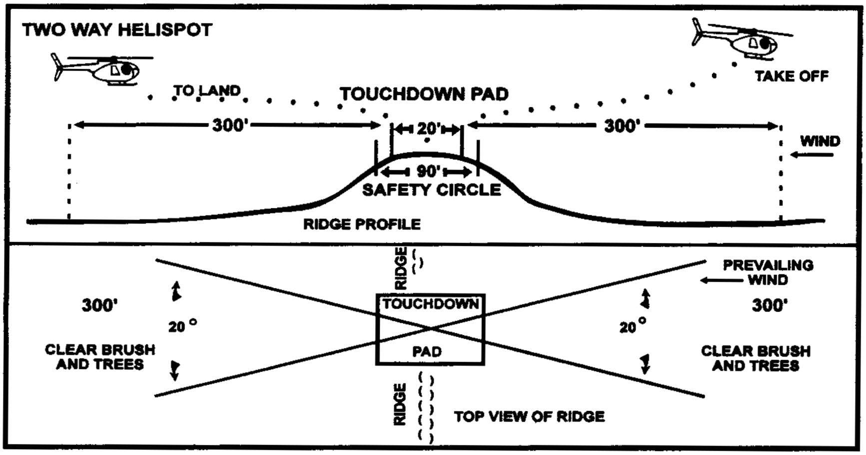
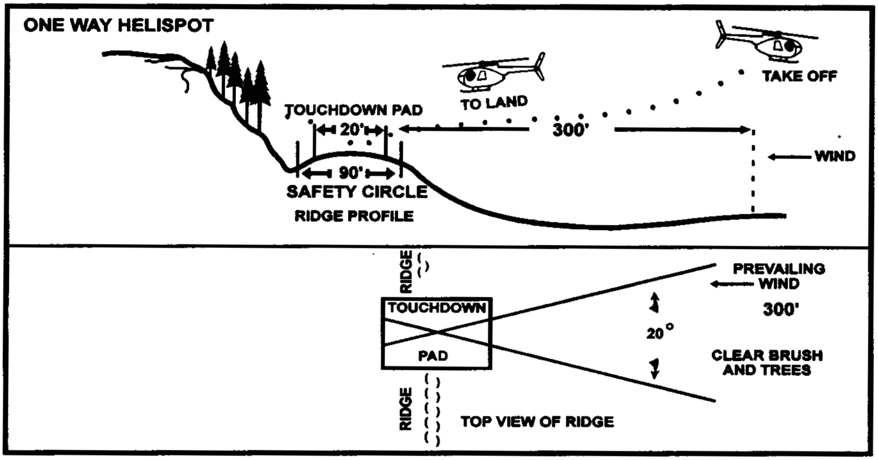


Exhibit 8-2: Example of a One-Way Helispot



1. Hand Construction. Hand construction methods are best since there is less ground disturbance than that created by mechanized construction. There are measures which can be implemented during construction of a helibase or helispot that will lessen the workload during rehabilitation and help ensure that the objective of restoration to as close to a natural state as possible is achieved. These include:

   - Cut trees or snags close to the ground, leaving stump heights of 0-3 inches. It is recognized that this may not always be possible during initial construction. Follow up flush cutting may be necessary.

   - If possible, and only if it can be performed safely, fell trees or other vegetation so that some cut trees and snags will be in a crisscrossed or natural appearing arrangement.

   - Buck up only what is necessary to achieve a safe operation in and around the touchdown pad and in the approach/departure path(s). Bucked pieces are unnatural and also increase the workload of camouflaging cuts during helispot rehabilitation.

   - Limb only what is necessary to achieve a safe operation in and around the touchdown pad and in the approach/departure path(s). If possible, breaking of limbs is preferred to sawing. Excessive limbing results in additional, smooth-cut spots along the boles. It also creates an increased amount of limbs to either dispose of in the timbered area or to arrange in a fashion that resembles a natural ecosystem floor.

2. Mechanized Construction. Basic requirements are the same as those for hand construction. If large rocks are dislodged, they should be removed and placed in an area where they appear to be natural. Hand work is frequently necessary to cut the fringe of brush left by bulldozers. Dozer constructed landing areas generally have soil that is disturbed, requiring . Unless necessary, mechanized construction or improvement is to be avoided.

C. Specifications for Planning and Constructing Landing Areas.

Chart 8-1: Touchdown Pad and Safety Circle Dimensions

Type	**1**	**2**	**3**
Touchdown Pad Dimension	30’ x 30’	20’ x 20’	15’ x 15’
Safety Circle Diameter	110’	90’	75’

Safety circles and touchdown pad dimensions in Chart 8-1 are minimums for construction.

The Touchdown Pad is a designated area, that may have a prepared or improved surface, at a helispot or helibase that is used for takeoff, landing or parking of helicopters.

The Safety Circle is a zone that provides an obstruction-free area on all sides of the touchdown pad. For helispots and helibases, the only items that should be within the safety circle are a fire extinguisher, a pad marker, and if applicable, external loads awaiting transport. The Parking Tender may also be within the safety circle.

When there are multiple helicopters at a helibase, safety circle dimensions may or may not provide adequate clearance and separation between helicopters when rotors are turning.

Chart 8-2: Recommended Separation of Helicopters at Helibases

TYPE	I	II	III
Rotor to Rotor Separation	100’	75’	60’
Pad to Pad Separation	200’	125’	90’

Use the separation distances listed in Chart 8-2 as a guide when laying out a helibase. These recommended distances are not mandatory, but they can be used to provide appropriate separation between helicopters.

- When helicopter makes/models are known, the Rotor to Rotor separation dimensions may be used as a guide to provide adequate separation between helicopters.
- When helicopter makes/models are unknown, it is recommended that the Pad to Pad separation dimensions be used as a guide to provide adequate separation between helicopters.

D. General Locations for Helispots and Unimproved Landing Sites.

1. Ridge Tops. An exposed knob on a ridge offers the best location, especially if approach/departure is available from all or several directions. Consider the following. See Exhibit 8-1.
    - Minimum approach/departure path should be no less than the required safety circle.
    - Avoid cutting timber keyhole helispots visible from scenic roads, towns, rivers etc.
    - Clear brush and trees below the level of the landing area. Jumbled brush and limbs tend to dissipate the ground-effect cushion, resulting in an abrupt transition to out-of-ground-effect flight.
2. Lakes or Rivers. Bodies of water, with their less-than-solid surfaces, may reduce the benefits of ground effect. A helibase or helispot should offer a take-off and landing profile that will not place an aircraft loaded for “In-Ground-Effect” over water before sufficient airspeed and lift is achieved. Depth perception can also be a problem for overwater portions of approach/departure paths.

3. Canyon Bottoms. If the canyon is deep, the helicopter will need a long forward run to climb out of the canyon, or a wide spot in the canyon where it can circle to gain altitude.

4. Meadows. Caution should be exercised prior to using meadows with high grass. Grass tends to dissipate the ground-effect cushion. High grass may also hide rocks, logs, and swampy areas which are a hazard to both personnel and the helicopter's skids, wheels, or fuselage. Grassy areas are also a potential fire hazard.

5. Snow Areas. Depth perception on snow and glacial ice is often poor. It is important to clearly mark the landing site with objects of contrasting color. To reduce blowing snow, tramp the area thoroughly inside the safety circle. Reference Deep Snow Landings in Chapter 6 for additional information.

   If surfaces are icy, avoid locations that are over 6° (9:1) slope. Choose a site large enough and flat enough to keep main and tail rotors from striking ice pinnacles or pressure ridges. Test the surface and load-bearing capability of the touchdown pad area to avoid snow bridges, thinly covered crevasses, crusts, and cornices.

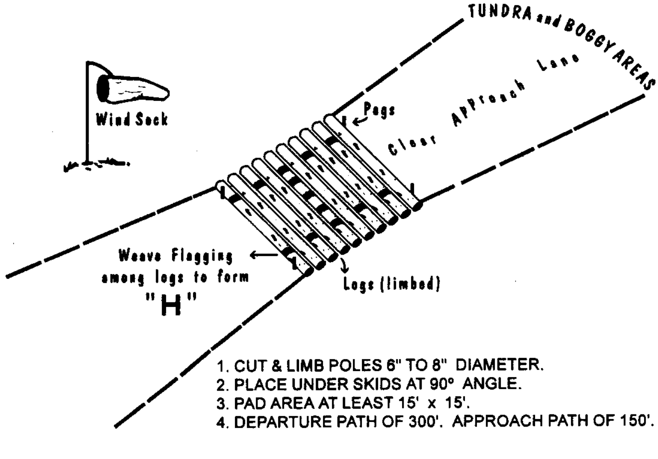
   Helicopters that operate in snow areas are usually equipped with snow pads which function similarly to snowshoes by spreading the weight of the helicopter over a larger load-bearing area. It is the Pilot's responsibility to determine if a landing can be safely made in snow conditions, with or without snow pads.

6. Tundra and Boggy Areas. Tundra and boggy areas are unstable surfaces. Helicopters that operate in tundra areas are usually equipped with tundra pads that function similarly to snow pads. See Exhibit 8-3.

   A log-deck pad may also be used. Cut and limb at least 10 poles, 20 feet long and approximately 6" to 8" in diameter. Use these to build a square touchdown pad. Place at right angles to the helicopter skids. The poles must be able to support the largest helicopter to be used. Secure the outer logs to prevent rolling or separation.

   Even when equipped with tundra pads, helicopters may sink into boggy tundra. To ensure adequate clearance for the tail rotor, there must be enough pad area and log strength to support the weight of the rear end of the skids. Exercise care when landing on and taking off from log-deck landing pads.

Exhibit 8-3: Log-Deck Landing Pad for Use in Tundra or Boggy Areas



E. Surface Features and Requirements.

Level or bottom land locations are best. The ideal approach/ departure path is 300' long minimum and slightly downhill. See Exhibits 8-1 and 8-2.

1. Slope.
   a. Avoid sloped pads that have over 9:1 slope ratio (6° or 11%) or 1.3"/foot slope.
   b. Pads must be as level as possible at temporary helibases and helispots.

Chart 8-3: Slope Conversion Chart

SLOPE RATIO	DEGREES SLOPE	PERCENT SLOPE	INCHES / FOOT
1:1	45.0	100	12
2:1	26.6	50	6
3:1	18.4	33	4
4:1	14.0	25	3
5:1	11.3	20	2.4
6:1	9.5	16.7	2.0
7:1	8.1	14.3	1.7
8:1	7.1	12.5	1.5
9:1	**6.3**	**11.1**	**1.3**
10:1	5.7	10	1.2

2. Safety Circle.
   a. Safety circles should be as level as possible with trees and large brush removed.
   b. Avoid damaging small bushes and grasses that help with . Limit dozer or other mechanical work as much as possible.
3. Touchdown Pad.
   a. The pad should be free of brush or other obstructions and large enough to accommodate all wheels or both skids. There must be adequate clearance under the fuselage to clear antennas, cargo hooks, or externally supported accessories.
   b. Pads must be firm enough to support the type of helicopter being used at temporary helibases and helispots.
   c. Where possible, avoid selection or construction of landing pads on a slope. The pad should be as level or as close to the terrain surface as possible without disturbing the small brush and grass cover.
4. Approach/Departure Path. Site selection should provide for approaches and departures in several directions. If the site is not located on a ridge top, an approach/departure path aligned with the prevailing wind should be constructed. If possible, avoid one-way helispots, although these landing sites are not inherently unsafe provided correct piloting techniques are followed.
   a. Winds. When possible, locate landing areas so that takeoffs and landings may be made into the prevailing winds.
   b. Full Performance Takeoff and Landing. Almost-vertical approaches and departures are not inherently unsafe, but should be avoided if possible, especially on an extended-use basis. Remember that most small helicopters must be at approximately 400' AGL at zero airspeed to execute a safe autorotation in the event of an engine failure. See Exhibit 8-4.

Exhibit 8-4: Full Performance Takeoff and Landing

c. Distance to Obstructions. An 8:1 slope can be used as a guide to provide an adequate slope for approach/departure. The 8:1 slope is measured from the edge of the safety circle and may be used as a guideline for obstruction removal when the terrain is relatively flat and level.

Chart 8-4: Distance form Obstacles

Distance from edge of Safety Circle	Height of Obstacle
80’	10’
160’	20’
240’	30’
320’	40’

d. Minimum Width. The minimum width for an approach/departure path is the diameter of the safety circle. Construction starts at the edge of the safety circle and extends in the takeoff direction far enough to permit normal no-wind takeoffs for the expected density altitudes. Safety is increased if the paths can be widened to a 20º angle from the center of the landing pad. To determine if additional clearing of obstructions is prudent or necessary:

- Take a compass reading down the center of the approach/departure path.
- Take a new reading 10º on each side of the centerline to determine the optimal, or 20º- wide path.
- Obstacles that occur between the point where these lines intersect with the minimum width of the approach/departure path (safety circle diameter) may be removed to increase safety.

e. Approach. The path should be free of obstructions which would prevent a normal approach. If environmental considerations restrict this from being accomplished, the helispot should not be built.

f. Departure. There should be enough level running space to permit normal acceleration from hover to translational lift and initial climb. If environmental considerations restrict this from being accomplished, the helispot should not be built.

g. Downdraft Areas. Avoid downdraft areas on lee sides of ridges.

IV. Required Equipment and Facilities.

Chart 8-5 lists equipment and facility requirements and standards for permanent helibases, temporary helibases, and helispots. Construction should take into account these needs and requirements.

Chart 8-5: Required and Recommended Facilities For Permanent Helibases, Temporary Helibases, and Helispots

REQUIREMENT	Permanent Helibase	Temporary Helibase	Helispot
Operations office or area for communications/ administrative purposes	Required	Required	NA
Communications equipment, to include, as appropriate, telephone, station-to-station and air-to-ground radios. Where no telephone service is available, a mobile or cellular phone should be installed at the site	Required	Required	Required (Handheld Radio Only)
Ready room/rest area for vendor personnel, including cots, toilet, desks, and, if possible, stove and refrigerator	Required	Required (Rest And Sanitation Facilities Only)	NA
Cache for agency-owned equipment	Required	NA	NA
Storage area for helicopter equipment and servicing supplies	Required	Recommended	NA
Parking and staging areas for vehicles (for ground-accessible sites)	Required	Required	NA
Water supply for drinking, utilities, and aircraft maintenance	Required	Recommended	NA
Maintenance lights, including electrical outlets if possible at each touchdown pad	Required	NA	NA
Security fence at least 150' from the center of the touchdown pad on the approach/departure path	Recommended	NA	NA
"No Smoking" and other safety and warning signs	Required	Required	Recommended
Evacuation and Crash rescue Kit	Required	Required	Recommended
Fire extinguisher located at each pad	Required	Required	Required
Scales for weighing passengers/cargo	Required	Required	Recommended
Wind indicators	Required	Required	Required
, if necessary	Required	Required	Required
Fueling capabilities	Required	Required	NA
Identifiable, marked touchdown pads	Required	Required	Required
Hazard map	Required	Required	NA
First Aid Kit	Required	Required	Recommended

* See Extinguisher, Crash Rescue, and Evacuation Kit Requirements for Helibase Chart 9-7 for specific extinguisher requirements.

V. Markings for Aerial Identification.

A. Helibases.

Permanent helibases should use the triangle and “H” marking in accordance with the approved FAA heliport standard. If a smaller area is to bear the marking, the design may be scaled down. The triangle-H design should be placed in the center of the touchdown pad with the solid apex of the triangle pointing to magnetic north. The base name, elevation, and latitude and longitude should also be painted on the pad. Permanent markings for temporary helibases are not required.

B. Helispots.

Incident or project helispots used on a recurrent basis by more than one helicopter should be numbered or identifiable from the air. Markers are available through warehouse caches.

1. Log-deck Touchdown Pad. Weave flagging or other colored cloth strips around the logs to form a letter “H”. Ensure cloth strip is secure and cannot unravel. See Exhibit 8-3.
2. Snow Areas. Depth perception on snow and glaciers is often poor, so it is important to clearly mark helispots with objects of contrasting color. Wands about 3 feet high with streamers attached, packs, tramping a trench to create shadows, spray painting, colored chalk, and smoke grenades are several methods of marking snow areas.
3. Miscellaneous Markings.
    - Painted rocks or well-secured and weighted signal panels may be used to outline a touchdown pad or landing area.
    - Color markings should provide sufficient contrast with the background area. Reflective material may be used. If paint is to be used, it must be environmentally acceptable (for example, a water-based paint).
    - Known hazards outside the safety circle such as poles, pipes, and high vegetation should be marked with colored ribbon or other means. Known hazards must also be marked on the hazard map at helibases and on Form HBM-2, Aviation Locations Summary, which identifies helispot hazards.

> **CAUTION:** Do <u>not</u> use ground panels in loose or rocky soil. Rotor wash will easily pull them out of the ground. If ground panels are used, check the spikes holding down the panels occasionally as they can work loose.

VI. .

A. Types and Methods.

The potential for dusty conditions usually exists when not operating from turf or pavement. must be accomplished at all helibases and helispots. This may be as simple as the application of water by ground equipment or from helicopter buckets or fixed tanks. A more complicated approach involves the application of chemical products. Their use may be of concern from an environmental standpoint and local authorities must be consulted prior to application.

1. Water.

   - Most commonly used.
   - Is usually the most economical.
   - Can be applied via ground or aerial delivery.

2. Chemical Products. Chemical products are usually more expensive than water, but provide a longer-lasting application. In the end, they may be less expensive since far fewer applications are required.

   a. Lignin Sulphate. The most commonly used chemical for is lignin sulphate. It is a by-product of the lumber industry, derived from wood pulp in the lumber milling process. The resulting lignin is mixed with ammonia and calcium bases to enhance its fertilizing characteristics. It has been used successfully on roads for soil stabilization and dust control. The cost, compared to other materials, is reasonable.

   Application considerations for lignin sulphate include:

   - Approved on an agency-specific basis.
   - Not approved for fixed-tank application.
   - Local Resource Advisor must be consulted prior to use.
   - No ground preparation is necessary.
   - Commercial sources who will travel to the site and apply the chemicals are available.

   Lignin Sulphate can be applied by many methods except for helicopter fixed-tank. Methods include using back-pack pumps, pillow tanks, rigid tank/ pump operations, helicopter buckets, and engines. Do not use potable water containers.

   Lignin Sulphate is mixed with water in ratios of 1:1 to 1:3, depending on temperatures and soil condition. Lignin sulphate is ready for use 15 to 30 minutes after mixing, depending on the ambient temperature. It can then be applied using any approved method. When the site is ready, apply the lignin sulphate/water mixture evenly and ensure proper coverage. If the area becomes churned up during operations, apply a small amount of water or more lignin sulphate/water mixture to make effective again.

All equipment must be cleaned with water. If the lignin sulphate dries, it breaks down with application of water and will wash out of clothing easily.

b. Retardant. Retardant is the most expensive method of and least desirable due to cost and cleanup factors.

B. Hazardous Materials and Materials Safety Data Sheets (MSDS).

MSDS sheets for materials should be obtained prior to use. These are available from the manufacturers or online. They should be available for the local Resource Advisor to review in determining environmental or ecological impacts.

VII. Procedures for Landings.

The Pilot and Helicopter Manager are responsible for choosing safe landing sites. The Helicopter Manager or passengers may indicate landing sites that are convenient to their ground work site or drop-off point. However, in no case will safety be compromised for convenience, nor will any passenger implicitly or explicitly attempt to pressure the Pilot into performing a landing, takeoff, or flight maneuver that is unsafe.

A. Load Calculations.

Prior to repetitive flights to and from the same helispot, the Helicopter Manager will consult with Pilot(s) and designate sites as either HIGE or HOGE. In planning and computing loads for those sites, applicable performance charts will be used.

B. High-Level Reconnaissance.

The Pilot shall fly a high-level reconnaissance before descending on the approach path to an unimproved landing site that has not been used before.

C. Areas to Avoid.

Avoid dusty landing areas. A low, slow flyby may be necessary to determine dust conditions. Avoid marshy areas and areas with high grass or shrubs where ground hazards and soil stability cannot be determined.

D. Wind Direction.

Ground personnel, if available, should furnish the Pilot with wind direction indication. This can be accomplished by throwing dirt, attaching flagging to vegetation, radio communication, or hand signal.

E. Reduction of Power.

Care must be taken to ensure that skids or wheels are down on solid ground before reducing power.

F. Pre-Exit Briefing.

The Pilot shall ensure that passengers are briefed on proper exit direction, especially when sloping terrain may pose a hazard to personnel exiting the helicopter.

G. One-Skid, Toe-In, or Step-Out Landings.

See Glossary for definitions. Except in a life threatening emergency, these types of landings are prohibited unless specifically authorized. Exemptions are agency-specific and should be carried by agency personnel or vendors engaging in these activities.

H. Tundra or Boggy Areas.

Inform the Pilot if landing gear or skids begin to sink into tundra or boggy area.

I. Snow Landings.

Snow landings may require agency approval. Check the Pilot Qualification Card for snow operations and ensure that the helicopter is equipped with snow pads.

VIII. Helibase and Helispot Rehabilitation and Restoration.

Refer to local resource management plans or local Resource Advisor for rehabilitation standards and guidelines.

CHAPTER 9: EQUIPMENT REQUIREMENTS AND MAINTENANCE.

I. Introduction.

The proper use and maintenance of equipment used in helicopter operations by ground, flight, and air crew personnel is essential to safety. Since much of this equipment is of high cost, proper maintenance is also cost effective.

II. Interagency Fire Helicopter Equipment Requirements.

The required items for interagency carded fire helicopters change frequently. For CWN fire helicopters, use and completion of Form HCM-2, Helicopter and Service Truck Pre-Use Checklist, with reference to the procurement document, should ensure that requirements are met. See Appendix A for instructions on completing this form. Consult the procurement document if uncertain about requirements.

III. Personal Protective Equipment (PPE).

Personal protective equipment (PPE) consists of clothing and equipment that provide protection to an individual in a hazardous environment.

If any flight crewmember, air crewmember, or passenger refuses to adhere to PPE requirements, the Helicopter Manager shall terminate the flight and report the non-compliance to the unit aviation manager using an agency incident/hazard report. Similarly, if an individual participating in helicopter ground operations refuses to wear required PPE, the operations shall be halted and a report filed.

Chart 9-1 provides a summary of personal protective equipment requirements for various aerial missions.

Chart 9-2 establishes PPE requirements for helicopter ground operations. It is at the discretion of the Helibase Manager, Deck Coordinator or Helicopter Manager to establish the appropriate level of PPE on the ground when no active helicopter operations are being conducted. Consult the specific helicopter procurement document for vendor personnel PPE requirements.

CHART 9-1: Requirements for Personal Protective Equipment – Flight Missions General Requirements (all occupants):

All Helicopter Flights	Fire Resistant Clothing (long sleeved shirt & pants, or flight suit) Fire Resistant and/or Leather Gloves Approved Aviator Flight Helmet All-leather Boots Hearing Protection

Exceptions or Additional Requirements (all occupants):

Reconnaissance Over Water- Beyond Gliding Distance from Shore	<u>AdditionalRequirements</u>: -Personal Floatation Device (PFD) NOTE: Fire resistant clothing and leather boots not required.
Reconnaissance Over Water- Extended	<u>AdditionalRequirements</u>: -Personal Floatation Device (PFD) -Anti-Exposure Garments -Raft & Kit -Exceptions - see *ALSE Handbook* NOTE: Fire resistant clothing and leather boots not required.
Individual Not Restrained by Installed Aircraft Restraint Systems (Spotter, Cargo letdown, Cargo Freefall, ACETA, PSD, etc.)	<u>AdditionalRequirements</u>: -Approved Auxiliary Restraint Harness/Tether
Extreme Environmental Conditions (wet, boggy, extreme cold, etc.)	<u>Exception</u>: -Rubber/Synthetic Footwear or Clothing ***Requires specific agency waiver to policy***
Rappel, Short-Haul, Cargo letdown, Aerial Ignition	Refer to applicable specialty guide/handbook for specific PPE Requirements.
Firefighter	<u>Exception</u>: -May wear a hardhat with chinstrap in lieu of an aviator flight helmet <u>only</u> when being transported as passenger during fire operations from an established, managed helispot/ helibase to another established, managed helispot/helibase. A managed helibase/helispot is established when there is a helicopter crewmember or helibase/helispot manager on the ground at the helibase or helispot before passengers are transported to these locations.

CHART 9-2: Requirements for Personal Protective Equipment – Ground Operations

General Requirements:

All Government Personnel – While Working Around Operating Helicopters or When "On the Deck" when Helicopters are Operating It is at the discretion of the Helibase Manager, Deck Coordinator or Helicopter Manager to establish the appropriate level of PPE on the ground when no active helicopter operations are being conducted or for positions not assigned to the deck.	Fire Resistant Clothing (long sleeved shirt & pants, or flight suit) Hardhat with Chinstrap (or approved aviator flight helmet) Fire Resistant and/or Leather Gloves All-leather Boots Eye Protection Hearing Protection

Exceptions or Additional Requirements:

Longline Hook-up Personnel/ Marshallers	AdditionalRecommendation: -Aviator helmet with handheld radio adaptor is recommended. Radio contact with pilot is required.
Helitorch Mixmaster, Helitorch Crewmembers	Refer to the *Interagency Aerial Ignition Guide* for specific PPE requirements.
Government Fuelers	AdditionalRequirement/Exception: -Must wear "Non-Static" clothing. -May use rubber gloves in lieu of leather gloves. -Eye and hearing protection required only when in the vicinity of operating helicopters (rapid refueling).
Contract Fuelers	Refer to requirements for vendor personnel outlined in the procurement document.

A. Head Protection.

When flying or when working on the ground around operating helicopters, only approved headgear shall be worn, as outlined in Charts 9-1 and 9-2. The Pilot must always wear an approved flight helmet.

1. Aviator Flight Helmets. The aviator flight helmet, consisting of a one-piece hard shell made of polycarbonate, Kevlar, carbon fiber or fiberglass must cover the top, sides (including the temple area and to below the ears) and the rear of the head. The helmet shall be equipped with a chin strap and shall be appropriately adjusted for proper fit. Helmets should be individually fitted for maximum protection.

Flight helmets for helicopter usage must conform to a national certifying agency standard such as Department of Transportation (DOT), Snell, SFI or an appropriate military standard, or appropriate equivalent standard. Examples of flight helmets currently approved for helicopter applications are the SPH-5, HGU-84P, SPH-4B and the HGU-56P manufactured by Gentex; the Alpha 200, Alpha 400 and Alpha Eagle (900) manufactured by Interactive Safety Products; and the MSA Gallet LH050 (single inner visor), LH150 (single outer visor) and the LH250 (dual visor, one inner and one outer).

The flight helmet should be equipped with avionics compatible with helicopter avionics specifications. Each helmet should be stored in a helmet bag when not in use, and should be kept clean and free of defects. Clean with mild soap and water only. Inspect and maintain the flight helmet in accordance with manufacturer's specifications.

2. Hard Hats. The hard hat must be equipped and worn with a chin strap securely fastened below the chin prior to entry to the helicopter, at all times during flight, and upon departure from the aircraft.

B. Hearing Protection.

Hearing protection is required when inside or around operating helicopters. The helicopter flight helmet provides the requisite protection; however, the addition of earplugs for frequent users of helicopters is recommended. Earplugs are required for firefighters who are not required to wear flight helmets. Sound barrier earmuffs may be worn in lieu of earplugs when performing ground operations duties. See Chart 9-1.

C. Eye Protection.

Goggles, or other approved safety eyewear, shall be worn when performing ground operations duties. A helicopter flight helmet with visor down may be used in lieu of a hard hat and goggles when radio communications with the pilot is necessary via a radio connected through the helmet.

D. Fire-Resistant Clothing.

The primary purpose of fire-resistant clothing is to provide the wearer with protection from flash fire burns.

1. Material. The approved material for flight suits, gloves, and recommended for outer garments, garments worn under the flight suit, and undergarments is generically referred to as "fire resistant clothing." The actual material may be fire resistant cotton, polyamide, aramide, polybenzimidazole, Kevlar, or blends thereof.

> NOTE: Fire resistant clothing may be laundered and tumble dried at temperatures up to 180° F without shrinkage or damage. Dry cleaning is also approved for some material. Starch is not approved, since starch is flammable.

CAUTION: All garments must be kept clean. Fuels, grease, oils, and other combustible materials embedded in the fabric will burn at their normal flash points even though the fire resistant clothing will not char until a higher temperature is reached.

2. Flight Suits. Flight suits are fire resistant coveralls that fit loosely and provide trapped airspace that acts as insulation to provide protection in a fire. The proper size flight suit covers the maximum area of skin. This includes sleeves long enough to reach the first knuckle on the thumb before securing snugly over the flight gloves at the wrist. The pant legs shall be long enough to completely cover the boot tops while in a seated position. The slide fastener front closure provides coverage high on the neck. Flight suits are available in 4.5 ounce and 6.0 ounce material.

3. Shirt/Pants Combination. The use of the wildland firefighter fire resistant shirt and pants (two-piece) is authorized. The shirt sleeves and pant legs shall have sufficient length to allow overlap of the glove cuffs and boot tops, respectively. Shirt cuffs shall be worn down and fastened. When wearing two-piece flight suits or the shirt/pants combination, the shirt shall be tucked into the trousers.

NOTE: When the full complement of PPE is not worn, as excepted in Chart 9-1, the government supervisor is required to inform the crew and passengers of the increased personal hazard associated with wearing non-fire resistant clothing.

An example would be a search and rescue where specialized PPE or clothing necessary for protection against arctic temperatures for extended periods is deemed critical to individual survival.

IV. Survival Equipment.

This section covers requirements for survival equipment for overwater missions, survival kits for special use overland missions, and first aid kits for all missions. It is the responsibility of the Helicopter Manager or Project Flight Manager for each flight to ensure that proper and adequate survival equipment for the planned mission is aboard and available for all crewmembers and passengers.

NOTE: All survival equipment described in this section requires scheduled inspections, testing, and in some instances, timed replacement. Management at the using level shall establish and monitor the appropriate compliance procedure.

A. Overwater Flotation and Survival Equipment.

Floatation and survival gear equipment standards are specified for overwater operations by 14 CFR 91 and 14 CFR 135.

CAUTION: Users of PFDs must be trained in their proper use.

1. Approved Personal Flotation Devices (PFD).

- Shall be worn by each individual on board the helicopter when conducting operations beyond gliding distance to shore, operating off of or to water , and during all hovering flights over water sources such as ponds, streams, lakes, and coastal waters. A PFD may not be required when obtaining water solely from heli-wells or porta-tanks, unless specified by procurement document.

- Approved Personal Flotation Devices (PFD) shall be worn by each individual on board the helicopter with emergency equipment on board and easily accessible when conducting Extended Overwater Operations more than 50 nautical miles of nearest shoreline and more than 50 nautical miles from an off shore heliport structure.

- Automatic inflation (water activated) personal flotation devices shall not be allowed.

- Agency personnel must adhere to guidelines outlined by policy when that direction is more restrictive than the above information.

- Vendor personnel should reference the procurement document for guidance regarding the use of Personal Flotation Devices.

> NOTE: Mission planning for overwater flights requires careful consideration of all elements of risk management and hazard reduction. Aviation Life Support Equipment (ALSE) appropriate for overwater missions being planned must be based on flight time over water, flight following (report frequency and accuracy), water/air temperature, search and rescue availability and response time to the mission area, and the capability of the proposed ALSE to sustain life.

B. Overland Survival.

Like overwater missions, planning for overland missions requires careful consideration of all elements of risk management and hazard reduction. On overland flights, personnel will be more likely to possess appropriate garments for the mission area involved. This does not exempt mission planners from assuring that crews and passengers have adequate clothing to survive in the event of a mishap.

Survival kits are required for all special use missions. Refer to the procurement document for a description of required contents.

Chart 9-3: Recommended Survival Kit - Extreme Environmental Conditions

#	WINTER	#	SUMMER
1	Compass	1	Compass
1	Knife	1	Knife
1	Flashlight with 2 extra batteries	1	Flashlight with 2 extra batteries
1	Signal Mirror	1	Signal Mirror
1	Additional Signaling Device (Strobe, Smoke Bomb, Water Dye, etc.)	1	Additional Signaling Device (Strobe, Smoke Bomb, Water Dye, etc.)
1	Box Matches in Waterproof Container	1	Box Matches in Waterproof Container
1	Individual First Aid Kit	1	Individual First Aid Kit
1	40’ Length Nylon Rope	1	40’ Length Nylon Rope
1	Roll Toilet Paper	1	Roll Toilet Paper
2	Candles	2	Candles
1	50 Gal. Capacity Trash Bag	1	50 Gal. Capacity Trash Bag
4	Quarts Water/Person	4	Quarts Water/Person Water Bag (collapsible)
1	Water Bag	1	Whistle
1	Whistle	1	Handsaw or Wire Saw
1	Handsaw or Wire Saw	4	Collapsible Shovel
1	Collapsible Shovel	1	Meals-Ready-To-Eat (MREs)/Person
6	Meals-Ready-To-Eat (MREs)/Person	1	Survival Manual, Desert
1	Survival Manual, Winter	1	46 pt. IV Tubing
1	46 pt. IV Tubing	1	Bottle Iodine Tablets
1	Bottle Iodine Tablets	1	Snakebite Kit
1	Arctic Sleeping Bag/2 persons	1	Bottle Insect Repellent
1	Metal Container (for melting snow)	1	Container w/carrying handles or straps
1	Container w/carrying handles or straps	1	Insect Head Net (per occupant)
1	Personal ELT (per occupant)	2	Personal ELT (per occupant)
2	Signal Panels	1	Signal Panels
1	Snow Shoes (set)	1	Ax or Hatchet
1	Ax or Hatchet	1	Bottle of Sunscreen
1	Gill net/assorted Fishing Tackle		Gill net/assorted Fishing Tackle

1. Personal Survival Vests or Hand-Carried Survival Kits. In addition to the required survival kits, personal survival vests or hand-carried survival kits are strongly recommended, but not required.

   CAUTION: Accident experience has shown conclusively that survival equipment not attached to the occupants at the time of egress will not be available to the survivors.

2. First Aid Kit – Aeronautical. Refer to procurement document.

   Equipment shall be installed per agency specifications on agency owned helicopters and per the procurement document on vendor owned helicopters.

V. Aircraft Equipment.

Equipment shall be installed per agency specifications on agency-owned helicopters and per the procurement document on vendor helicopters.

A. Personnel Restraints, Seat Belts, and Harnesses.

1. General Requirements. The following are required for all helicopter flight activities, except for special activities as outlined in Section V.A.2, Restraints for Special Activities, below.

    - FAA approved double-strap shoulder harness with automatic, locking inertia reels for each front seat occupant.
    - Approved 3 or 4 point restraint system for all aft seat passengers. Shoulder harnesses shall be worn.
    - Shoulder straps and lap belts shall fasten with one single-point, metal-to-metal, quick release mechanism. Heavy-duty (military style) harnesses such as those installed in Bell medium helicopters are acceptable although they have fabric loops connecting the shoulder harnesses to the male portion of the buckle.

2. Restraints for Special Activities. Special activities which may require restraint systems other than the seat belt/shoulder harness configuration include, but are not limited to, helicopter rappelling, aerial ignition, ACETA missions, short-haul, cargo letdown, photography, and infrared sensing.

    Personnel performing special activities while doors are open or removed and who need to be in a location other than normal (that is, seated with normal restraint system), must wear an approved secondary restraint. The harness must be attached to an approved tether and helicopter hard point. See Exhibit 9-1.

    For additional information on restraints for special activities, refer to the appropriate guide/handbook (for example, *Interagency Helicopter Rappel Guide*) or agency directive.

Exhibit 9-1: Example of Restraint Harness Configuration

B. Emergency Locating Transmitter (ELT).

An Emergency Locator Transmitter (ELT) shall be installed on helicopters.

C. Emergency Position Indicator Radio Beacon (EPIRB).

The EPIRB is battery operated, water-resistant, and will float with the attached antenna vertical. An EPIRB should be included in the survival equipment carried in life rafts. Units required for extended overwater operations should be “Class A” with automatic water activation and a manual activation provision.

A “mini Class B” EPIRB is approved for use with life vests (survival vests, survival suits, and life rafts not required to meet the extended overwater operations criteria). These units may be manually or water-activated, and shall include a float collar or be secured to the vest.

D. Personal Emergency Locator Transmitter (P-ELT).

The P-ELT is available from several manufactures. Typical designations include “Portable Rescue Beacon,” “Personal Downed-Pilot Locator,” or “Human Emergency Locator.” These units are not required, but are highly recommended to be included in personal survival vests or float vests where a mini-EPIRB may be too large.

E. Fire Extinguisher.

A fire extinguisher meeting the requirements of the procurement document shall be installed in the helicopter.

VI. Crash Rescue Equipment for Helicopter Landing Sites.

The following requirements apply to helicopter landing sites on incidents or projects. Chapter 12 contains additional crash rescue information and discussion.

A. Requirements for Fire Extinguishers, Evacuation Kits, and Crash Rescue Kits at

Helicopter Landing Sites. Personnel must be trained and briefed in the use of crash rescue equipment. Chart 9-4 specifies required numbers and types for helibases. See Chapter 8 for helispot requirements. There is no extinguisher requirement for an unimproved landing site unless the site is used on a recurring basis.

Chart 9-4: Extinguisher, Crash rescue, and Evacuation Kit Requirements for Helibases

No. of Helicopters	Number And Type Extinguishers	No. Of Crash Rescue Kits	No. Of Evacuation Kits
1-4	1 20-pound 40-B:C Extinguisher per landing pad	1	1
5-10	1 20-pound 40-B:C Extinguisher per landing pad	2	2
11 +	1 20-pound 40-B:C Extinguisher per landing pad	1 Kit per every 5 helicopters	1 Kit per every 5 helicopters

Permanent helibases should have the amount of equipment indicated for the largest operation that could be accommodated at the permanent helibase. In addition, it is recommended that permanent helibases substitute a wheeled, aircraft-type extinguisher for the 20-pound, 40-B:C extinguisher.

B. Crash Rescue Kit.

The crash rescue kit consists of the items specified in Chart 9-5. See Chapter 12 for further information and discussion concerning use of the crash rescue kit.

Chart 9-5: Crash rescue Kit Components

QUANTITY	ITEM
1 Ea	Axe, Crash, Serrated Edge
1 Ea	Axe, Crash, Smooth Edge Blade, Hacksaw
10 Ea	Case, Cloth, Carrying, 2-piece Set
1 Ea	Cutter, Bolt, 24”
1 Ea	Frame, Hacksaw
1 Ea	Knife, Rescue,
1 Ea	Seat-belt Type
1 Ea	Opener, Door, w/ Claw Tool
1 Ea	Pliers, 12”, adjustable joint, angle nose

C. Evacuation Kit.

The Evacuation Kit consists of the items specified in Chart 9-6.

Chart 9-6: Evacuation Kit Components

QUANTITY	ITEM
1 Pg	Battery, size AA
3 Ea	Blanket, paper, disposable, 60" x 90"
1 Ea	Carton, fiberboard, 42" x 13.5 " x 14"
4 Ea	Compress, cold
1 Hk (Hank)	Cord, cotton braided, 1/8" x 100'
2 Ea	Head lamp, single cell, cordless
1 Kt	Kit, first aid, 24 person
2 Bx	Lightstick, Yellow
1 Ea	Litter, S.K.E.D.
3 Ea	Marker, Ground
1 Ea	Pamphlet, OPM-14, "How To Help The Injured"
1 Ea	Pliers, slip joint, 6"
2 Hk	Rope, nylon. 1/4" X 100'
1 Ea	Screwdriver, flat tip, 6"
1 Se	Splints, inflatable, all limbs, 6 piece
1 Ea	Stretcher, basket, 2 piece

VII. Standard Equipment for External Loads.

This section addresses external load helicopter accessories for transporting equipment and supplies. These components include swivels, leadlines, buckets, hooks, nets, etc., that are attached to the cargo hook of the helicopter. Equipment must be rated for vertical lifting and must have a working capacity equal to or greater than the load to be carried.

A. Approval of Helicopters and Pilots for External Loads.

Users should always check each Aircraft Data Card and Pilot Qualifications Card to ensure that the aircraft and pilot are current and authorized to perform the external load mission.

B. Cargo Baskets and Racks.

Loads contained in cargo baskets or racks are considered external, non-jettisonable loads. All cargo carried in baskets or racks shall be restrained by means of "bungee cords" or other fastening device. Chapter 11 outlines correct methods of loading and carrying cargo in external racks.

CAUTION: Bungee cords or other cargo restraint devices must be fastened securely to the rack. Check for tears, rips, or cracks. Do not use if restraints are damaged.

C. Cargo Hook.

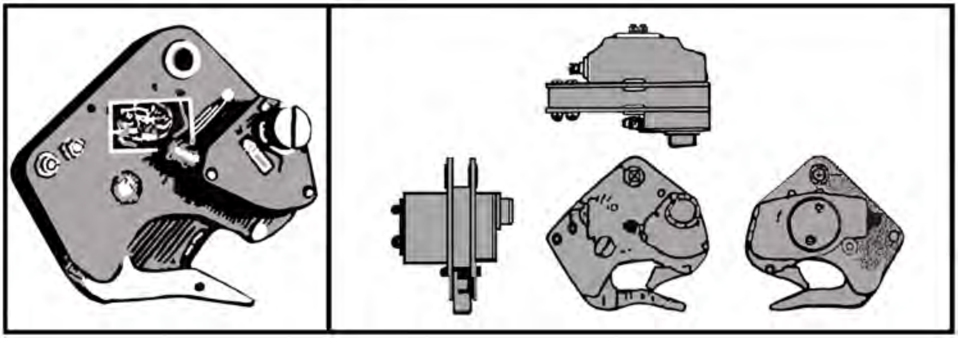
The cargo hook is attached to the belly of the helicopter. It must be FAA approved, self-cocking and automatic locking. It may be loaded and locked in a single motion with one hand. The release must be both manually and electrically operated by the Pilot from the cockpit. See Exhibit 9-2.

The cargo hook also has a manual release on the hook itself that can be operated by the individual performing the hook-up. This release allows the Pilot or hook-up person to check that the hook is functioning properly.

CAUTION: Prior to using the hook, it is extremely important to first test the manual release, then the electrical release to ensure that both function properly. This sequence is necessary because the manual release is usually a cable release susceptible to snagging.

Move the cargo hook to its extreme travel limits to ensure that the manual release will not operate inadvertently. There should be at least ½ " slack in the operating cable with the hook in all possible positions.

Exhibit 9-2: Typical Cargo Hook

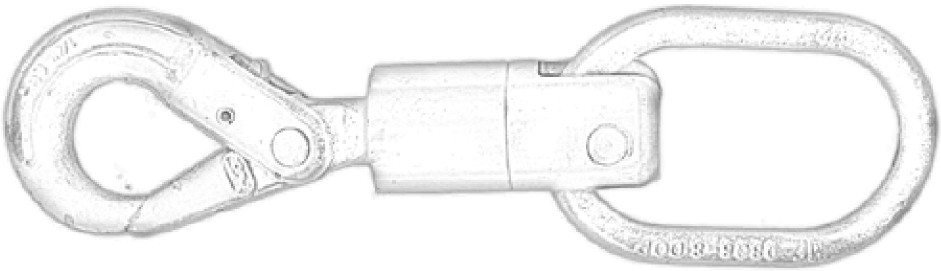


D. Swivel.

A cargo swivel consists of a ring or link on the upper end, a hook on the lower end, and a swivel section in between. The ring or link and hook may be integral with, or detachable from, the swivel body. If detachable, components should be replaceable and attached by bolts secured with self-locking nuts, or some other system that provides equivalent safety. See Exhibit 9-3.

A swivel allows the load to rotate while in flight and prevents the leadline from twisting, preventing cable damage or inadvertent release.

Exhibit 9-3: Typical Swivel



1. Capacity of Swivels. Standard swivels are rated at 3000 and 6000 pounds. Swivels must be rated for vertical lifting and must have a working capacity equal to or greater than the load to be carried. Approved swivels may be obtained through the National Fire Cache System.

CAUTION: Swivels without a capacity stamp must not be used.

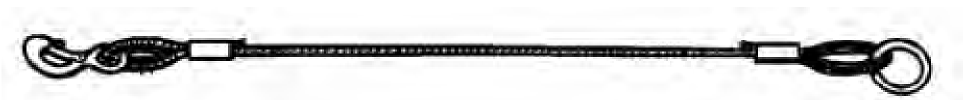
2. Inspection and Maintenance of Swivels. When inspecting swivels, check:

   - The spinning action of the swivel.
   - The condition of the integrated latch system.
   - The bolts on the detachable type of swivel.
   - Check all serviceable parts.

E. Leadline.

A leadline is an accessory that connects the load to the helicopter. A leadline is constructed of flexible steel cable with a ring or link on one end, and a hook on the other. All end loops for leadlines are formed around heavy metal thimbles and spliced or swaged. See Exhibit 9-4

Exhibit 9-4: Typical Leadline



Chapter 11 contains a discussion of when and how to use a leadline, when to use longer leadline lengths, etc.

CAUTION: **The use of synthetic leadlines** made of nylon/polypropylene rope or nylon or natural fiber straps **is not normally approved** due to the potential of these materials to become frayed and fail, or for snapback or stream back into the tail rotor system. However, there are missions such as the transport of live animals where the use of non-twisting synthetic or natural fiber ropes or straps is preferred, and is in fact critical to the well-being of the animals. If used, the equipment must be closely inspected.

1. Capacity and Size of Leadlines. Leadlines for most lengths are rated at 3000 and 6000 pounds. Standard length is twelve (12) feet, with twenty-five (25) and fifty (50) foot lengths available. The leadline must have a working capacity equal to or greater than the load to be carried.

2. Inspection and Maintenance of Leadlines. When inspecting leadlines, check:

   - The condition of the keeper-gate on the hook at the end of the cable. The keeper-gate is the part that generally becomes broken or damaged. Exert force laterally on the keeper gate. If there is significant "play" in the gate, do not use. Also, if the gate can be moved beyond the curved edge of the hook (that is, outside the hook itself), do not use. Be sure to tag the leadline with an explanation on what is wrong with it.

   - Swages are metal sleeves where the end of the cable forms a loop. Ensure they are secured on the cable. Swages are painted for slippage check and should not be covered. Copper swages should have a compression groove from being pressed together. If in doubt, or the cable is kinked, tag the line as out-of- service and do not use.

CAUTION: Leadlines with aluminum swages shall not be used.

F. Longline with Remote Electric Hook[1].

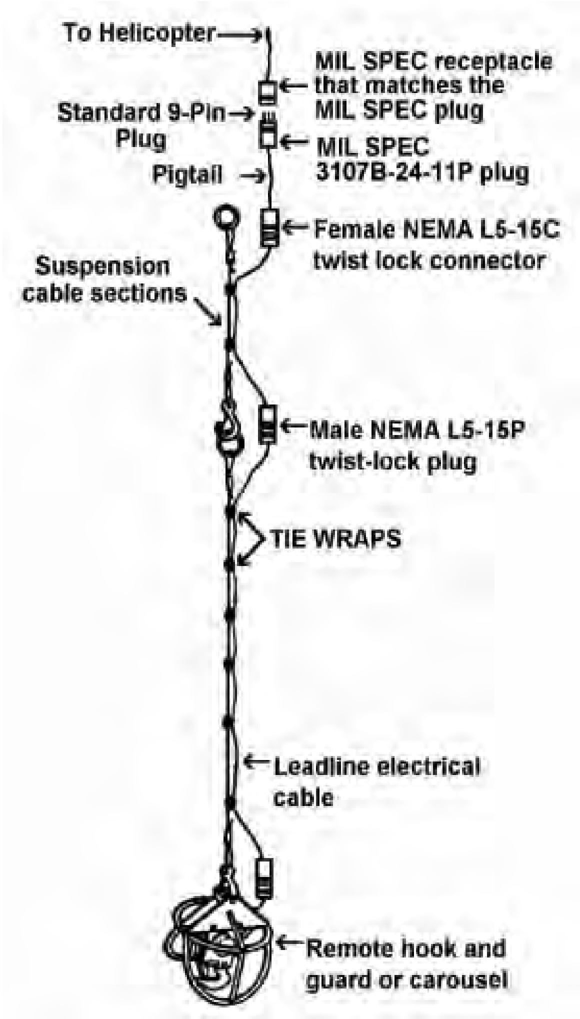
The longline/remote hook system consists of suspension cable sections, a remote cargo hook, a remote hook guard and handgrip, appropriate matching attaching hardware, and electrical pigtail. The Pilot is able to electrically release loads attached to the remote hook. See Exhibit 9-5.

1. Remote Hook.

   At the end of the cable is a remote electric hook, similar to the cargo hook on the helicopter. An electrical line runs the length of the cable and is plugged into the electrical system of the helicopter. The other end is plugged to the remote hook. The hook is self-cocking (that is, it should return to "latched" position after the electrical "release" signal is removed).

[1]Remote hook systems are described in detail in "Remote Hook Systems for Helicopters," No. 8457 1203, USDA Forest Service, San Dimas Technology And Development Center, San Dimas, CA 91773.

Exhibit 9-5: Typical Longline/Remote Electric Hook Equipment Configuration



2. Remote Hook Guard.

The general requirements of the remote hook guard are to provide:

- A medium to attach the remote hook to the remote hook system suspension cable.
- Protection of the remote hook when the hook is placed on the ground.
- A handle for the crewmember using the remote hook from the ground.
- Adequate weight to ensure good flying qualities of the remote hook and longline.

3. Suspension Cable Section.

The system is designed in cable lengths of fifty (50) feet and greater. The line should be constructed of anti-twist, counter-wound cable. The cable attaches to the helicopter cargo hook on one end by means of a steel ring. On the other end, it attaches to the remote hook by means of a clevis or hook.

> NOTE: Synthetic longlines may be used by the vendor as suspension cable sections when specified in the procurement document and approved by the agency aircraft inspector.

4. Inspection and Maintenance of Longline with Remote Electric Hook. When inspecting longlines with remote hooks and preparing them for use, lay the cables out and check:

- For kinks or abrasions in the electrical cable.
- For cracked or broken electrical plugs at each section.
- For broken or bent keepers on the hook connections.
- The condition of swages at the end of each cable section.
- The condition of keepers on hook gates at the end of each line.
- That the electrical line is attached to the cable with plastic tie-wraps or duct/ electrical tape placed at 12-inch intervals the length of the longline.
- That the electric plug to the helicopter is a standard and not a twist-type plug (it must be able to release if the longline is jettisoned during an emergency).
- That there is no swivel between the helicopter and the remote hook.

After everything has been checked, attached, and plugged in, test to ensure that:

- The electric and manual releases are operational on the helicopter cargo hook.
- The remote hook is functioning.

CAUTION: Pay particular attention to the helicopter's emergency manual release cable. Misrouting or improper adjustment of this cable has caused numerous inadvertent releases.

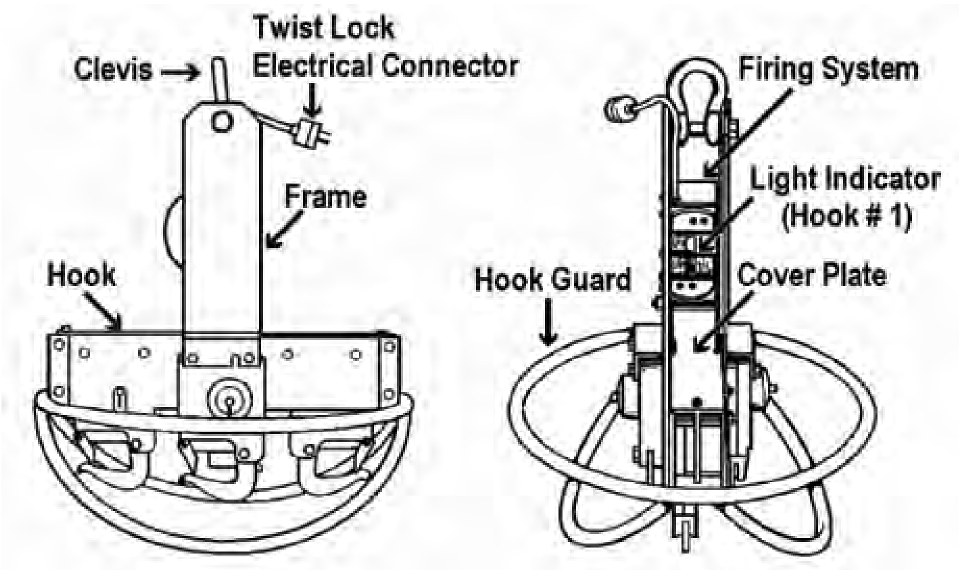
G. Multiple Remote Cargo Hook System (Carousel Hook).[2]

This system is identical to the remote hook system, except that an integrated multiple cargo hook device, a carousel, is substituted for the remote hook and remote hook guard. The multiple remote carousels enhance efficiency by allowing the delivery of various loads to different locations. See Exhibit 9-6.

A carousel consists of four or more individual hooks mounted together on a single hookguard. The pilot controls the release system from the cockpit.

Check all components associated with the longline system, plus ensure that all electrical connections in the carousel are protected from dust and impact.

Exhibit 9-6: Typical Four-Hook Carousel System



[2] For additional information, see Equip Tips "Four Hook Carousel and Light Cargo Net System," USDA Forest Service, San Dimas Technology and Development Center, San Dimas, CA 91773

H. Cargo Net.

1. Heavy Cargo Net. Cargo nets come in both round and square configurations. The net is used to transport cargo suspended beneath the helicopter from the cargo hook, permitting delivery without landing. Nets are usually constructed from braided polypropylene or nylon rope.

   Each net consists of a net mesh and a perimeter rope or ropes with tethering rings connecting the segments of the perimeter rope. The lines are attached to the net by loops with thimbles that reinforce the rope loops.

   When tension is applied to the lines, during both load preparation and during lifting, the net is forced closed, similar to a drawstring. This is referred to as a “purse net.”

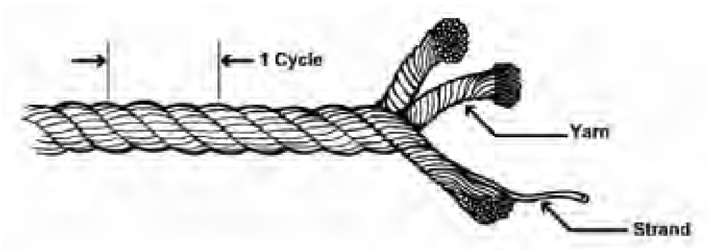
   One or two steel rings are attached to the end of the lines. This is the attachment point to a swivel or leadline.

   a. Capacity and Size of Cargo Nets. Nets come in the following commonly available sizes at 3000 and 6000 pound capacities:

      - Square nets: 12’ x 12’ (3000) or 15’ x 15’ (6000)
      - Round nets: 12’ (3000) or 15’ (6000) Diameter

   b. Inspection and Maintenance Of Cargo Nets. See Exhibit 9-7.

Exhibit 9-7: Rope Inspection



When inspecting cargo nets, check:

- For broken or worn braids or strands, particularly in the center of the net.
- For rope embrittlement, which is caused by exposure to the sun’s ultraviolet rays and is the most common cause of net failure. To test for brittleness, bend several areas of the cargo net’s rope 180 degrees back upon themselves. If there are brittle strands, they will audibly and visibly break. If more than one or two strands break per bend, do not use the net. Discard it, or return it to the manufacturer for repair.

- All rope loop thimbles for cracks, fractures and missing sections. Thimbles can sometimes be replaced by the manufacturer. On some of the heavier cargo nets, the mesh intersections are fixed with molded plastic crosses. These should be visually inspected for cracks and missing parts whenever the loop thimbles are inspected.

- Polypropylene nets for chalking. Run a hand over several of the ropes in the net, grasping the ropes lightly. If small, white, chalk-like fragments of the rope come off in your hand, then chalking has occurred. If chalking is present, it is likely that the net has received enough ultraviolet rays to cause embrittlement, and the net must be further inspected for broken strands before it is returned to service.

Ultraviolet exposure is the most important factor in the degradation of the strength of the cargo nets constructed from polypropylene rope, not use or age. There is no visual or other field inspection technique that will guarantee that a cargo net is free from degradation due to ultraviolet exposure. However, if the net is free of brittleness, has no more than 10 percent broken strands in any two adjacent cycles, and there is no chalking or other visible damage, then the net is probably safe for further use. If in doubt, remove from service.

NOTE: To prolong the life of cargo nets, use duffel bags to avoid unnecessary exposure to sunlight.

2. Lightweight Cargo Net.

An inexpensive, lightweight cargo net constructed of synthetic cord is desirable for certain operations. Lightweight nets come in round or square configurations and have a minimum 10 foot and a maximum 12 foot diameter or side dimension. These nets usually weigh approximately 1.5 pounds.

The net may have a four-corner pickup instead of a drawstring enclosure. Rope intersections are knotted to prevent slippage. Each corner has a 4.5 inch opening and is knotted and bonded with fiberglass to the mess line. There are also three knotted and fiberglass attachments on each side to ensure rapid and complete deployment.

It is recommended that a metal, locking carabineer or pear ring be placed between the corner loops and the swivel.

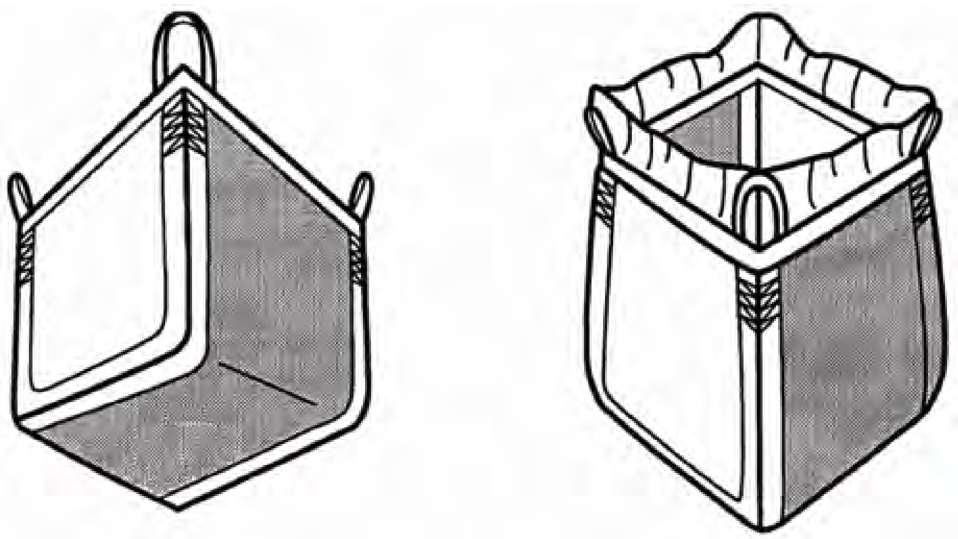
CAUTION: Lightweight cargo nets have a capacity of only 300 pounds.

I. Cargo Lift Bag.

Cargo lift bags, also known as “flexible intermediate bulk containers,” are an inexpensive alternative to cargo nets. They are available in both standard and custom- made sizes, are cubic in shape, and are made from an ultraviolet-resistant polypropylene fabric that “breathes.” Most styles have a safety band around the perimeter of the bag. Options include different liners, lifting straps, and filling and emptying capability through a bottom chute. A common size is 35” x 35” x 40”, with a weight of 5 pounds. See Exhibit 9-8.

> CAUTION: These bags should not be flown empty due to the potential for tail rotor entanglement. If no cargo is available, 50 pounds of ballast should be placed in the bag. It should be flown at a reduced airspeed. Use according to agency direction.

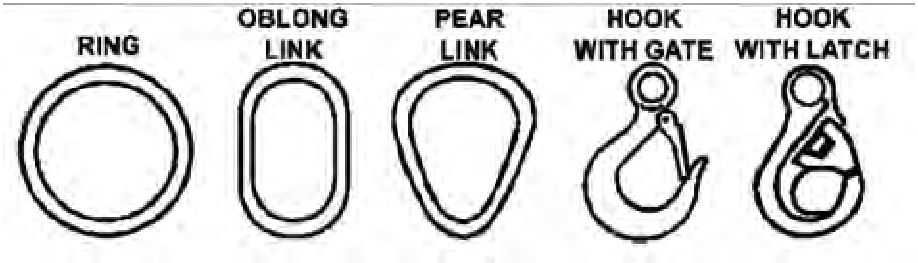
Exhibit 9-8: Typical Cargo Lift Bag



J. Rings, Links and Hooks.

Exhibit 9-9 depicts connector components including rings, links, and hooks. These form the connections between swivels, leadlines, cargo hooks, longlines, and/or remote hooks. The size, both inside and outside dimension, of rings, links, and hooks is critical, particularly at the cargo hook connection point, due to the potential for inadvertent release or "hung loads." Sizes must conform to the cargo hook manufacturer's recommendations. See Chapter 11 for a discussion of the importance of the cargo hook/ring interface.

Exhibit 9-9: Rings, Links and Hooks



K. Buckets.

Buckets are typically used on fires to dispense liquids such as water, fire retardant, and foam. Buckets used for hauling water may have a foam injection system for adding foam concentrate to the water while in flight. See Exhibits 9-10, 9-11 and 9-12.

The Pilot remotely activates the bucket mechanism. Each bucket consists of an open top shell, a bottom discharge door, control mechanism, support cable, and fittings. There are two basic shell designs, collapsible and rigid. A version of the collapsible type is also foldable. A Pilot-operated electrical switch mounted on the collective control must be the only switch to activate the discharge door.

Many buckets used for hauling water also have a foam-injection system for adding foam concentrate to the water while in flight.

Several methods are used to limit bucket capacity so that the weight of the water that fills the bucket is within the allowable payload limit. These include zippers, port caps or plugs. These items used as part of the capacity limiting system should be fastened to the bucket to prevent loss or damage.

The weight of the bucket and capacity at each position or adjustment level must be marked on the bucket.

For other than tandem rotor helicopters, while conducting water bucket operations, airspeed shall be limited to 80 KIAS or the airspeed limitation established by the Rotorcraft Flight Manual, whichever is less. Each operator, Pilot and helicopter manager shall review the manufacturer's bucket operator's manual and limitations for the applicable bucket prior to use.

NOTE: Refer to chapter 7, III. 14, for more information on managing bucket payloads.

Longlines may be used during bucket operations. This allows access to different dip sites as well as reduces the amount of rotor wash experienced at the delivery site.

- If a longline is used for water bucket operations, then the longline shall be a minimum of 50 feet in length to reduce the risk of entanglement with the tail rotor or tail boom.
- Pilots using longlines with water buckets must be approved for vertical reference longline operations.
- Lines of less than 50 feet are not authorized and pilots who are not approved for longline vertical reference operations must attach the bucket directly to the cargo (belly) hook during water bucket operations.

Exhibit 9-10: Typical Bucket - Rigid Shell

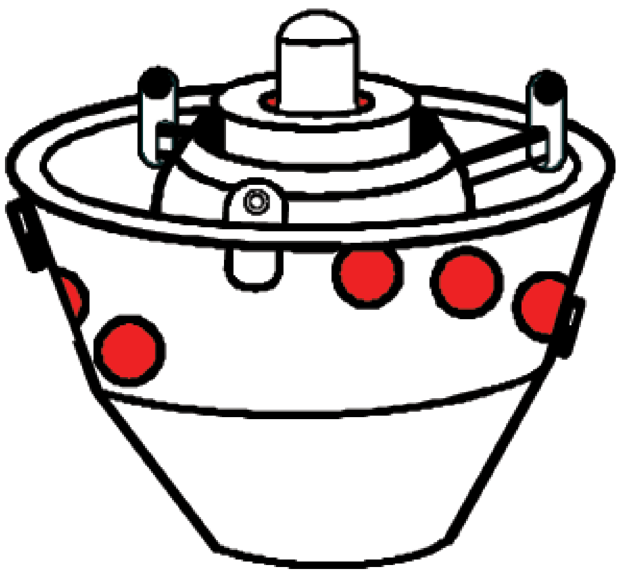


Exhibit 9-11: Typical Bucket – Collapsible

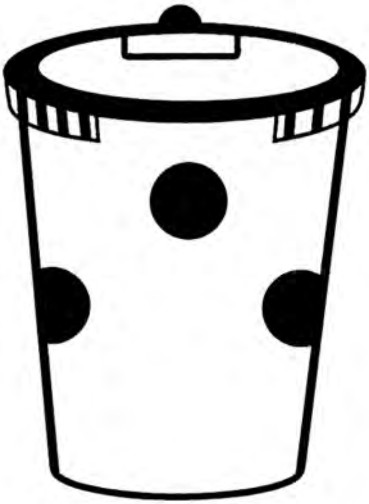
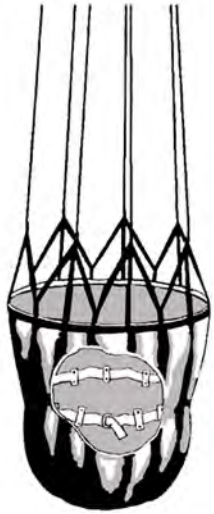


Exhibit 9-12: Typical Bucket – Collapsible/Foldable



L. Helicopter Fixed Tank.

A helicopter fixed tank is used to transport water, foam, or retardant to the fireline. The tank is attached to the belly of the helicopter. Some tanks require removal of the cargo hook.

Tanks are often filled with water from hoses connected to engines, fixed ground tanks, or other sources. When retardant is used, a portable retardant mixing site is located adjacent to the fill site. Tanks may also have on board foam-injection systems.

Some helicopter fixed tanks have the capability to draw water via an extended nozzle or snorkel while hovering above the water source.

CAUTION: Do not use Lignin Sulphate product in fixed tanks.

VIII. Specialized External Load Equipment.

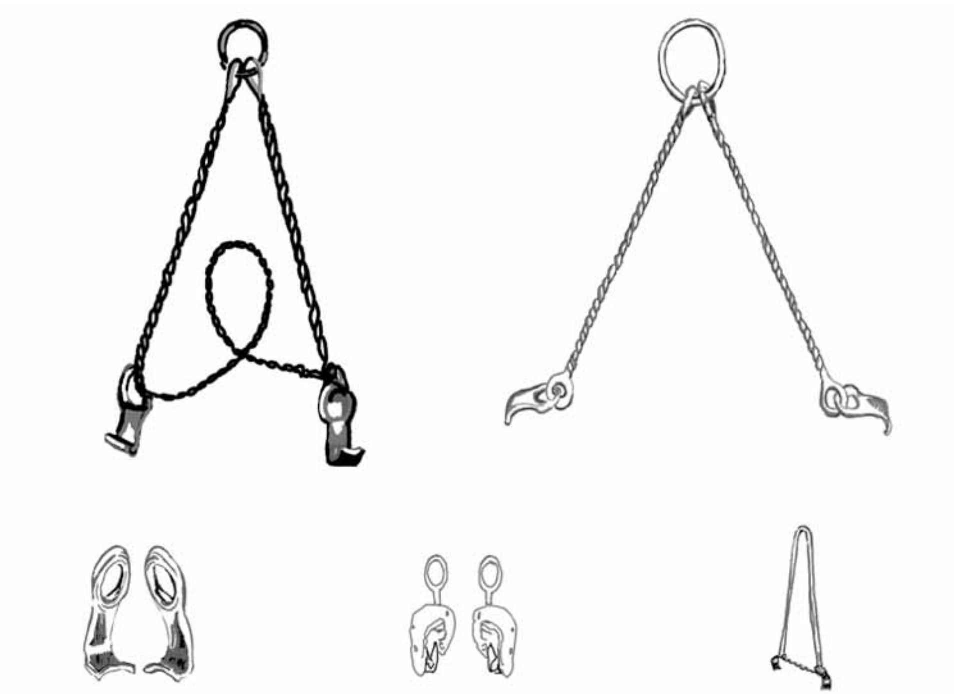
External load equipment is designed to transport items whose dimensions or other characteristics preclude use of conventional cargo nets and/or leadlines. These include, but are not limited to:

A. Barrel Hooks/Clamps.

Barrel hooks are made of chain or cable. Two sets are usually used together. A bungee cord with a clip on one end allows the pilot to independently hook up loads. Not attaching the bungee allows the hooks to drop off the barrel on touchdown at an unattended site. See Exhibit 9-13.

CAUTION: Be especially careful not to fly over persons or structures when using barrel hooks/clamps. A cargo net is the recommended method for transporting barrels.

Exhibit 9-13: Barrel Hooks/Clamps

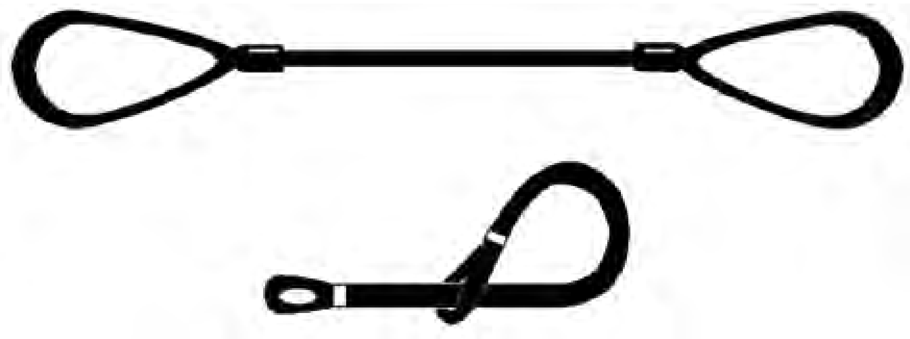


B. Chokers.

Chokers are used primarily to transport logs, lengths of pipe, or other materials that are too long or bulky to be transported in a cargo net. They are made of wire rope, fabric strapping, chain, and other materials. Logging operations use a cable choker with a ball on the end that clips into a sliding catch further up the cable. The result is that the cable "chokes" down on the load when it is under tension. See Chapter 11 for more information on the correct rigging of chokers. See Exhibit 9-14.

> CAUTION: Be especially careful not to fly over persons or structures when using chokers.
>
> CAUTION: Chokers are not to be used as leadlines.

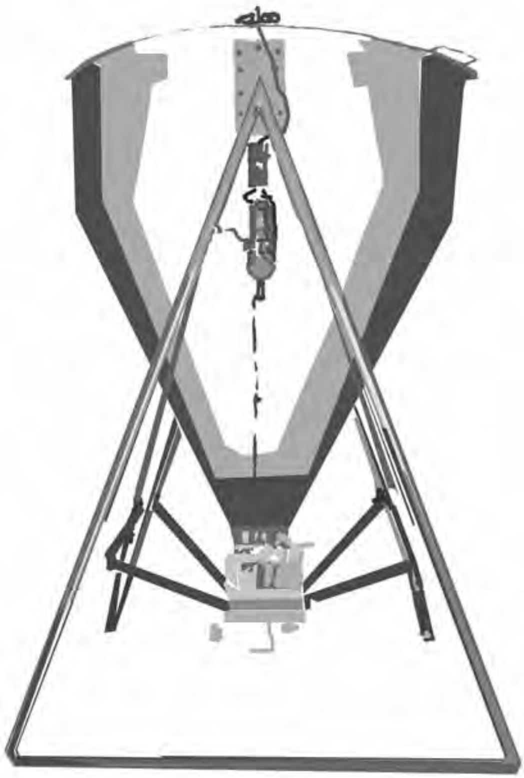
Exhibit 9-14: Typical Chokers



C. Seed and Fertilizer Spreaders.

Spreaders are typically self-contained in that only power and control is required from the helicopter for the device to operate. They are supplied complete with appropriate rigging and lines for connection to the helicopter cargo hook. In some cases, spreaders are supplied with their own internal combustion engine. See manufacturer's literature for specific operating instructions and weights for load calculations. See Exhibit 9-15.

Exhibit 9-15: Typical Seeder Configuration

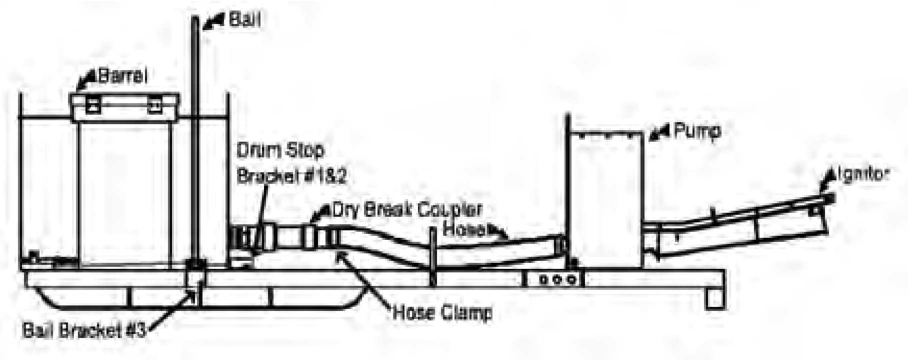


D. Helitorch.

The helitorch is a self-contained unit used for aerial ignition. The torch dispenses gelled gasoline or diesel fuel and provides a hotter, faster, and longer ignition than other methods. The unit is jettisonable in an emergency. It is attached to the helicopter at a line length to give the pilot maximum visibility and control. The unit can be attached to any helicopter with a cargo hook and a 28-volt power supply. A complete helitorch system includes control cables, aluminum mixing paddle, extra barrel, spreader bar and augmented ignition system. See Exhibit 9-16.

For further information, refer to the *Interagency Aerial Ignition Guide*. See manufacturer's literature for specific operating instructions and weights for load calculations.

Exhibit 9-16: Typical Helitorch



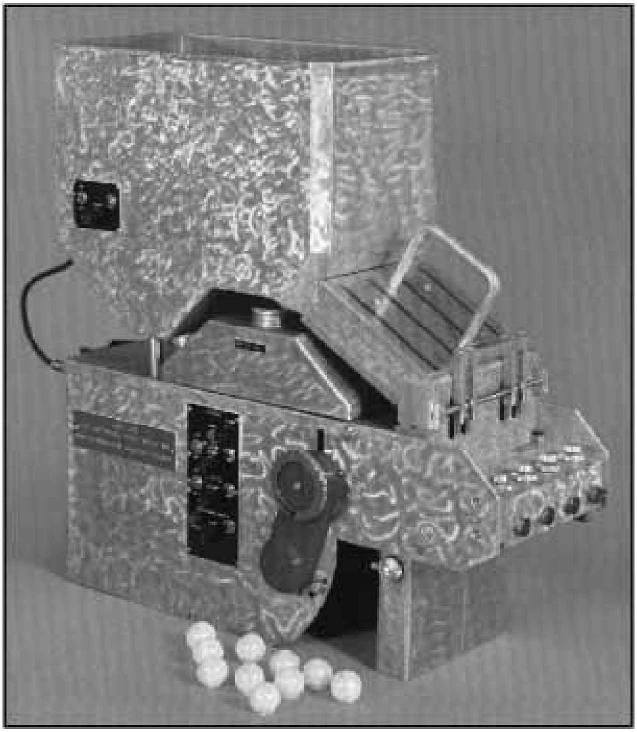
E. Plastic Sphere Dispenser (PSD).

The PSD is an effective aerial ignition tool when used to ignite fine, flashy fuels. The device functions by injecting glycol into a plastic sphere (“ping-pong ball”) which contains potassium permanganate. An exothermic reaction starts, and the dispenser expels the primed sphere from the aircraft. It is designed to accomplish this process with minimum manipulation and a high degree of safety and reliability. See Exhibit 9-17.

The main frame of the dispenser is constructed of welded aluminum. Power is supplied to the dispenser from the aircraft power supply through a quick-disconnect fitting and internal fusing. A central control panel contains all the electrical components and switches to operate the different stations such as the main drive, glycol pump, slow-fast speed and the emergency water supply. All electrical controls for this operation are conveniently located on the hopper.

For further information, refer to the *Interagency Aerial Ignition Guide*. See manufacturer’s literature for specific operating instructions and weights for load calculations.

Exhibit 9-17: Typical Plastic Sphere Dispenser

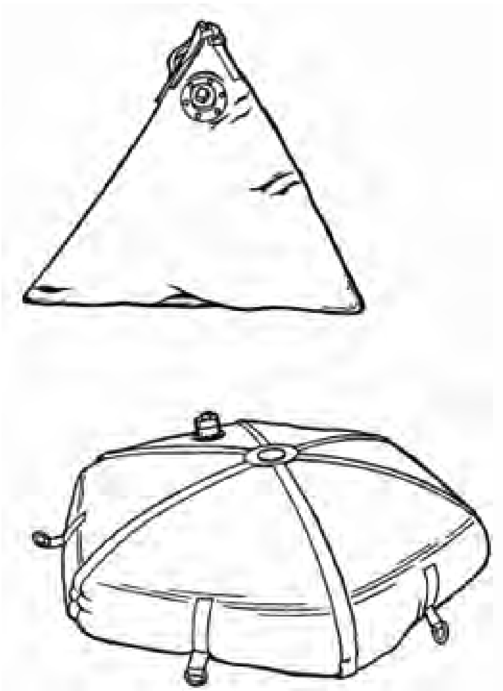


F. Slingable Bags.

Slingable bags are flexible and somewhat self-supporting. They are used to transport and store various liquids such as potable water, water for firefighting, fuel, etc. These bags are designed to be attached to a swivel and leadline, which is then attached to the cargo hook on the helicopter or the remote hook/longline, depending on operational needs. See Exhibit 9-18.

CAUTION: Avoid placement on slopes unless there are personnel on the ground to secure the bag. Otherwise, it may roll downhill. When transporting empty water bags, they must be taped into a compact package and attached to the leadline or longline with a swivel.

**Exhibit 9-18: Typical Slingable Water Bags. Top: Less than 160 Gallons
Bottom: 300 Gallons**



IX. Ground-Based Tank Systems for Helicopter Dipping and Filling.

A. Portable Auxiliary (Rigid) Water Tanks.

Portable auxiliary (rigid) water tanks are designed for water storage during fire suppression or other operations requiring a reserve water supply. Water may be mixed with retardant in the tank using a portable retardant blender. Tanks are available in 600 to 3000 gallon sizes. See Exhibit 9-19.

> CAUTION: Tanks must be tethered to the ground with ropes or cord, with rocks or other material placed in the bottom of the tank to prevent the tank from being blown into the helicopter rotor system.

The following applies to rigid water tanks.

- Helicopters may dip out of the tanks, which are filled from either a natural water source such as a stream or pond or from a mobile source such as a water tender.
- Inspect all portable retardant tanks prior to use for protrusions and snagging hazards. Ensure that there are NO rings or protrusions around the perimeter of the tank that a snorkel or bucket can catch on. Remove the hazard or shield it from the snorkel/bucket assembly. If the parts can't be removed and the hazard can't be otherwise mitigated by shielding/wrapping, remove the tank from service.
- Helicopters may transport water to the tank via bucket or fixed-tanks, with water supply operations to the line conducted by pumping or gravity feed out of the tank. Use of this method can significantly increase water efficiency, especially during mop up, particularly if tanks are strategically placed.

Exhibit 9-19: Typical Portable Auxiliary (Rigid) Water Tanks

B. Self-Supporting Open-Top (“Pumpkin”) Water Tanks.

Pumpkin water tanks come in many sizes and hold water or retardant. They may be filled by ground from a water or retardant source for helicopters to dip out of, or they may be supplied by helicopter to support hose lay operations from the tank. See Exhibit 9-20.

Tanks are designed to be transportable in a compact, collapsed state. A buoyant collar surrounds the top opening. Hydrostatic pressure supplies the only support.

CAUTION: The top opening of even the largest pumpkin tanks may be too small for Type 1 helicopter buckets to be safely filled.

Exhibit 9-20: Typical Self-Supporting Open-Top (“Pumpkin”) Tank

X. Helicopter Manager’s Kit.

The kit items listed in Appendix B, Exhibit B-18, are recommended for a Helicopter Manager’s Kit for both incident and project use. Helicopter managers are responsible for assembling the kit and maintaining it. Additional copies of forms should be reproduced locally at the incident.

XI. Helibase Manager's Kit.

The items listed in Appendix B, Exhibit B-19, are recommended for a Helibase Manager's Kit for both incident and project use. Helibase Managers are responsible for putting the kit together and maintaining it. Additional copies of forms should be reproduced locally at the incident.

XII. Recommended Standard Contract Helicopter Crew Support (Chase) Truck.

The following specifications are a recommended standard for a fire, exclusive-use contract helicopter, crew support truck.

- Vehicle with GVWR capable of carrying helicopter support and associated equipment listed on Chart 9-9.
- 6 Passenger Crew Cab
- High-Profile, Utility Body

XIII. Recommended Standard Equipment for Contract Helicopter Crew Support (Chase) Truck.

The stocking levels listed in Appendix B, Exhibit B-20, enable an exclusive-use contract fire helicopter crew to meet not only local initial attack needs, but also the minimum equipment and operational needs for establishing a helibase during the initial phases of a large incident. This capability is essential since there may be multi-day delays in obtaining required helibase safety and operational equipment through warehouse caches.

These items should be carried on board the chase truck to all incidents or projects. Helicopter Managers are responsible for obtaining and maintaining the stocking levels.

Managers are also responsible for updating the NFES numbers on the list.

Local units with moderate to high fire activity, or with recurrent project helibase operations, are encouraged to stock an adequate supply of helibase management equipment (cargo nets, leadlines, swivels, etc.) in the local fire cache.

CHAPTER 10: PERSONNEL TRANSPORT.

I. Introduction.

The safe transport of personnel in helicopters is of the highest priority. Using standard procedures for transport outlined in this chapter will ensure, to the extent possible, that agencies meet their objective of transporting personnel safely and efficiently.

In order for personnel to be transported legally in a government aircraft[1], each passenger must meet the definition of authorized passenger.

Refer to the glossary for definitions of flight crew member, air crew member and passenger. Air crew members may be permitted on board aircraft during certain missions (for example, external loads) on which passengers are prohibited.

A. Aircrew/crewmember.

A person working in and around aircraft and is essential to ensure the safety and successful outcome of the mission. Aircrew members are required to either be on board or attend to the loading and unloading of passengers and cargo at all landings and takeoffs, attend to external loads and ensure that passengers have received a pre-flight safety briefing.

B. Authorized/Official Passengers.

Passengers are any persons aboard an aircraft who does not perform the function of a flight crew/pilot or aircrew member. Passengers may be transported in government aircraft only if they meet the definition of an official passenger.

- Officials and employees of the federal government travelling on official business.
- Members of Congress and employees of congressional committee staffs whose work relates to the agency's programs.
- Non-federal passengers when engaged in missions which enhance accomplishment of an agency program such as personnel of cooperating state, county or local agencies; representatives of foreign governments; and contractor's representatives to include those employed by such agencies; and private citizens.

C. Unauthorized Passengers.

All personnel who are not official passengers shall be considered unauthorized passengers and are not authorized to be transported in any aircraft owned or operated by or on behalf of the government. A person who is otherwise an official passenger could become unauthorized by performing a function for which that person is not authorized, e.g. a passenger performing pilot duties without proper authorization.

[1] Government aircraft are defined as those owned, bailed, loaned, leased or lease/purchased, rented, chartered, or contracted by a government agency.

D. Carriage of Government Employees Aboard Restricted Category Helicopters.

Government employees may not be passengers or air crew members aboard helicopters operated as restricted category aircraft.

E. OMB Circular A-126 Requirements.

OMB Circular A-126 establishes approval and reporting requirements for both point-to-point administrative travel cost-comparisons and mission flights involving Senior Federal Officials. Refer to agency specific directives for guidance. The local unit aviation manager is usually responsible for meeting these requirements. State and local agencies may have similar direction.

F. News Media as Passengers.

Agency officials may authorize members of accredited news organizations to fly in government aircraft subject to the following requirements:

1. General. A qualified Helicopter Manager or Flight Manager shall be assigned to the mission. All requirements regarding use of personal protective equipment, flight following, load calculations, and hazard analysis shall be followed.
2. Resource/Project Missions. If the mission is special use, a Project Aviation Safety Plan shall be required and approved by line management prior to the flight. It must show that the carriage of news media aboard the aircraft is of an official nature and is advantageous to the agency. Since news media are thereby designated official passengers, no flight release waiver is necessary.
3. Incident Missions. As a general rule, the Incident Commander on Type I or II Incident Management Teams may authorize all flights with media on board. On local unit fires, the line manager or their designee is usually the approving authority. Flights on government aircraft with news media aboard must be in the interest of the government. No flight release waiver is required. This general guidance may be further restricted by agency local unit policy. The air operations staff should check with the local area to ascertain any additional restrictions or necessary approvals.
4. Restricted Category Helicopters. Carriage of news media aboard restricted category aircraft is specifically prohibited.

II. Qualified Personnel.

Helicopter and helibase management personnel must be qualified to supervise and coordinate passenger transport activities on incidents or projects per the requirements in Chapter 2.

III. Load Calculations and Manifesting.

During passenger transport operations, load calculations shall be performed prior to any flight activity in accordance with procedures outlined in Chapter 7 and Appendix A. Personnel manifesting procedures are addressed later in this chapter.

IV. Air Crew Member On Board During External Load Missions.

As a general rule, only the Pilot(s) shall be aboard helicopters when conducting external load operations.

However, FAR 133 authorizes an aircrew member to be aboard the aircraft when conducting external load operations when:

- The safety of a mission can be <u>substantially</u> enhanced, <u>and</u>
- The capability of the helicopter is not <u>significantly</u> reduced, <u>and</u>
- The helicopter is not in the restricted category.

Missions where safety and/or effectiveness may be enhanced by an aircrew member being on board during the conduct of external load missions include, but are not limited to:

- Conditions of visibility (smoke, smog) and/or terrain where the Pilot requests an observer aboard to optimize detection of obstacles and other aircraft.
- Complexity of the incident or project and the cockpit workload, to include large numbers of aircraft operating in the vicinity, close and frequent coordination needed with ground personnel, overloaded radio frequencies, etc.
- Areas of airspace complexity (military training areas such as Special Use Airspace or Military Training Routes; high-density civil operations) where the observer could enhance the ability to avoid collisions with other aircraft.

The Pilot has the final authority regarding carrying an aircrew member during external load operations. Air operations staff should conduct an on-site risk analysis which weighs the benefits of increased safety and efficiency versus the added exposure. The mission(s) must also be adequately planned.

Individual agency exemptions granted by the FAA to FAR 91.119, Minimum Safe Altitudes, may also require an observer on board during specified situations. Consult the Interagency Airspace Coordination Guide.

V. Procedures for Transporting Personnel at Helibases or Helispots.

At project or incident helibases and helispots, large numbers of personnel are often moved via helicopter(s). When preparing for transport of personnel, the following guidelines apply.

A. Arrival of Personnel at the Helibase or Helispot.

- The person in charge of any group of people needing helicopter transportation (for example, Crew Supervisor, Strike Team Leader, Chief-of-Party) shall report to the person in charge of the helibase or helispot.
- The person in charge should give the Helicopter Manager, Flight Manager, or Loadmaster a list of the people to be transported so that a manifest can be completed. Passengers should be appropriately clothed (PPE) and ready for transportation.

B. Manifesting Personnel.

The manifesting process tracks personnel being transported and ensures that allowable payload limitations are not exceeded. Consult Appendix A for instructions on completion of Form HCM-9, Interagency Helicopter Passenger/Cargo Manifest. To complete this form the manifester will need the following.

- Full name of each person being transported
- Weight of each person with personal gear
- Weight of additional tools and equipment
- Destination of personnel and/or cargo
- The person in charge should maintain control of personnel at all times.

NOTE: Manifesting of handcrews using their crew manifest is acceptable. If a handcrew provides an accurate manifest, it is <u>not</u> necessary to transfer names to the Interagency Helicopter Passenger/Cargo manifest.

NOTE: Weights must be accurate, not estimated. If scales are available, use them. Scales are required at incident or project helibases and, if possible, should be provided at helispots.

C. Other Considerations.

- The Pilot's knowledge of helispot location, hazards, etc. On helibases, the use of Form HBM-2, Aviation Locations Summary, to provide a briefing is required.
- The method of handling and transporting tools, equipment, and supplies (external or internal, hazardous materials requirements, etc.).
- Emergency procedures to be followed.
- Stops to be made en route.
- Procedures for unloading personnel and/or cargo at destination, with the assurance that:

- The destination is staffed by trained personnel or,
- An air or flight crew member is assigned to the flight to assist or,
- One of the passengers is qualified to assist.

D. Passenger Safety Briefings.

Once manifesting has been completed, the safety briefing can be accomplished. Briefings shall be given to every passenger prior to entering the safety circle to board the helicopter. The briefing should follow the format in the Aircraft Safety Briefing. See Exhibit 10-1.

The safety briefing may be given by the Pilot or as delegated by the Pilot to authorized and qualified personnel such as a helicopter manager, flight manager, helicopter crewmember or Loadmaster. The person giving the briefing must:

- Ensure that instructions are clear and understood.
- Ensure in-flight emergency procedures are included.

E. Loading Procedures.

After the safety briefing has been given, consider the following:

- Helicopter crewmembers or other authorized, trained personnel shall assist in the loading operations.
- Personal items carried on board must be adequately secured.
- Prior to approaching the helicopter, remove canteen belts, vests with full pouches, fire shelters, and other items which might impede proper fastening of seat belts/shoulder harnesses. These items must be placed and secured in an appropriate area.
- Stay in safe area prescribed by helicopter crew or other authorized personnel until given the direction to load.
- Wear appropriate head protection as referenced in Chart 9-1.
- First person into the helicopter passenger compartment should move to center seat, or seat assigned by Pilot or helicopter crew personnel.
- Find seat belt and fasten; if unable, advise the helicopter crew person who will assist.
- Ensure that personal protective equipment is properly worn (that is, sleeves rolled down and collars up). See Chapter 9, Charts 9-1 and 9-2, for PPE requirements.
- Large gear such as fire tools should be handled by helicopter crew person.
- Ensure that all personnel understand the instructions given by Pilot or helicopter crew person.

CAUTION: When opening hinged doors to embark or disembark, passengers should keep one hand on the door at all times until the door is secured.

F. In-Flight Precautions.

- No smoking during flight.
- Keep clear of controls. DO NOT TOUCH controls except in an emergency where, if the Pilot is incapacitated, a passenger may shut down the fuel and electrical supply.
- Secure all items, especially when flying with the door(s) off or open.
- Be aware of emergency exits and read instructions pertaining to emergency egress. If in doubt, ask questions.

G. Unloading Procedures.

- Wait for Pilot, helicopter crewmember, or other authorized personnel to give a clear signal for offloading.
- Doors should be opened only by helicopter crewmembers, other authorized personnel, or at the direction of the Pilot when no one is available at the landing site.
- Remove seat belts and lay them on the seat. If possible, refasten them before exiting.

CAUTION: Ensure that seat belts are inside the aircraft when closing doors. A loose seat belt can cause major damage when the helicopter becomes airborne.

- Maintain control of all personal items. If an item is lost, do not go after it.
- Exit the helicopter slowly and use the departure route indicated by the helicopter crew or the Pilot. When large numbers of passengers are being transported, helicopter personnel will normally accompany passengers from the aircraft to the safety zone.

CAUTION: When exiting the aircraft, do not walk toward the tail rotor or uphill. If in doubt, ask the Pilot or helicopter personnel what the approved exit route is.

- After leaving the helicopter, move to an area which is not in the departure flight path for the helicopter.
- Once shut-down procedures have been initiated by the pilot, passengers should wait to exit until the rotors have come to a complete stop.

VI. Personnel Transport Using Military Helicopters.

A. Incident Operations.

For aviation operations using Active Duty/Reserve Military helicopters, and National Guard units officially “federalized” by DoD, refer to Chapter 70 of the Military Use Handbook for specific policy and procedural information.

The use of National Guard units for federal firefighting purposes within their state must be outlined in national, regional, state or local agreements and Memorandums of Understanding (MOUs) between federal agencies and the specific National Guard units.

B. Project Operations.

It is recommended that an agency Helicopter Manager be assigned to any military helicopter ordered for a project. Duties and responsibilities are the same as those for incident operations.

VII. Special Law Enforcement Operations.

See Chapter 16 for differences in passenger transport procedures on special law enforcement missions. Unless specifically authorized in Chapter 16, law enforcement missions shall adhere to the procedures outlined in this chapter.

VIII. Special Search and Rescue Operations.

See Chapter 17 for differences in passenger transport procedures on search and rescue missions. Unless specifically authorized in Chapter 17, search and rescue missions shall adhere to the procedures outlined in this chapter.

Exhibit 10-1: Standard Helicopter Safety Briefing Checklist

MANAGER BRIEFING WITH PILOT

1. **Pilot Card:** Qualified and current for aircraft type and mission.

2. **Aircraft Card:** Aircraft Approved for mission?

3. **Flight Plan/Resource Tracking:** FAA or Agency Flight plan filed; Resource Tracking procedures identified.

4. **Flight Following/Radio/AFF Equipment:** Flight following procedures in place; radio/AFF equipment is adequate and operational. During takeoffs and landings there should be no radio traffic that might distract the pilot.

5. **Nature of Mission:** Pilot briefed on nature and sequence of mission.

6. **Analysis of Known Hazards:** Known hazards discussed; high-level recon prior to decent to low-level.

7. **PIC Concept:** Pilot shall not be pressured into performing missions beyond pilot's capability or that of the aircraft.

8. **Hazardous Materials:** Identify any Hazardous Materials that will be transported and notify the Pilot. Take appropriate actions.

HELICOPTER PASSENGER BRIEFING (FRONT)

Pilot or designated Helitack must brief all passengers prior to flight

1. Personal Protective Equipment: See Chart 9-1 for requirements.
    - Nomex Clothing (long-sleeved shirt & pants, or flight suit)
    - Approved Helicopter Flight Helmet
    - All-Leather Boots
    - Hearing Protection
    - Nomex and/or Leather Gloves
    - Survival Equipment as applicable (PFD, Life Rafts, etc.)
2. NO Smoking: Rules in and around aircraft
3. Approach and departure paths:
    - Always approach and depart from the down slope (lower) side as directed by Pilot/Helitack
    - Approach and depart helicopter in a crouch position, do not run
    - Keep in pilot's field of vision at all times
    - Stay clear of landing area when helicopters landing or departing
    - Stay away from the main and tail rotors. Do not chase any item that has become unsecured
    - Never go near the tail of helicopters
4. Tools and Equipment:
    - Secure hand tools and equipment awaiting transport
    - Make assignments for carrying tools/equipment to/from helicopter
    - Carry tools/long objects parallel to the ground, never on shoulder
    - All tools and equipment loaded/unloaded by qualified personnel
    - Portable Radios turned off
5. Helicopter Doors: Location and normal operation

Exhibit 10-1: Standard Helicopter Safety Briefing Checklist (continued)

HELICOPTER PASSENGER BRIEFING (CONTINUED)

6. In-Flight Discipline:
   - Follow the instructions of pilot
   - Loose items inside of aircraft secured and manageable
   - All baggage secured in aircraft or cargo compartment
   - Never throw any object from the helicopter
   - No movement inside aircraft once seated
   - Keep clear of the flight controls at all times
   - Unbuckle only when directed to do so by Pilot or Helitack
   - Leave doors closed, wait for Helitack personnel to unload
   - Know location of first aid kit, survival kit, fire extinguisher, ELT fuel and battery shutoff switch location and operation, radio operation, oxygen use (if available)
7. In-Flight Emergency Procedures
   - Emergency Exits: Location and normal operation
   - Follow instructions of Pilot/Helitack personnel
   - Snug seat belt and shoulder harness; secure gear
   - Emergency Seating Position WITH SHOULDER HARNESS (four point OR single diagonal strap): sit in full upright position with head and back pressed against seat and use arms to brace in position. If time permits and so equipped, lock the inertial reel
   - Emergency Seating Position WITH LAP BELT ONLY: bend over as far as possible and hold onto your legs
   - Assist any injured person who cannot leave the aircraft
   - Move clear of the aircraft only after rotor blades stop or when instructed to do so by the pilot or helicopter crew
   - Assess situation, follow pilot/helicopter manager instructions, render first aid, remove first aid kit, survival kit, radio, ELT and fire extinguisher

CHAPTER 11: CARGO TRANSPORT.

I. Introduction.

When cargo is transported incorrectly, there is the potential for dropped external loads, hazardous materials spillage in the helicopter, overgrossed aircraft, cargo interference with the rotor systems, or other serious safety hazards. Incorrect methods of rigging and transporting cargo has resulted in catastrophic accidents. Use of the standard procedures outlined in this chapter will facilitate a safe and efficient cargo operation.

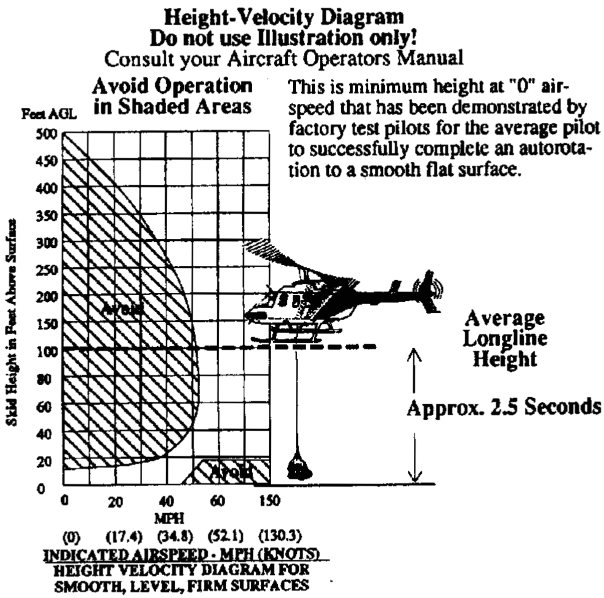
A. Longline Operations

1. Risk: The first thing to consider prior to any mission.

   Complete risk analysis is a must prior to deciding how a mission is to be accomplished, what equipment is to be used, and if the pilot and helicopter are correct for the job.

2. Height-Velocity Curve: What it means to the Pilot, Ground Crew and management.

   If a helicopter has a catastrophic engine failure while hovering at 100 feet AGL, it will contact the ground in approximately 2.5 seconds at a speed of 50 miles per hour, or 67 feet per second. Keep alert while working under a helicopter doing longline work!



II. Qualified Personnel.

A. Ground Personnel.

Helicopter and helibase management personnel must be trained and qualified to supervise and coordinate cargo transport activities on incidents or projects per the requirements found in Chapter 2, Chart 2-3.

Trained personnel should be provided at all loading and unloading sites. Any exceptions (for example, longline with remote electric hook transport) are noted in this chapter.

The following minimums are recommended for handling cargo transport (note that these are not related to the minimum fire helicopter staffing level requirements in Chapter 2):

- Four persons for Type 1 and 2 helicopters.
- Three persons per Type 3 helicopter.

These minimums provide for a Parking Tender, Loadmaster(s), and hook-up person.

B. Pilot Qualification.

The Pilot must be qualified for carriage of external loads and, if applicable, for longline (vertical reference).

III. Load Calculations and Manifesting.

During cargo transport operations, load calculations shall be performed prior to any flight activity. Weight of cargo is usually indicated either on the load calculation form or, if manifesting multiple trips under one load calculation, on the manifest form. Refer to Chapter 7, Load Calculations and Manifests, and to Appendix A Forms for detailed information and instructions.

IV. Air Crew Member on Board During External Load Missions.

An air crew member (for example, the Helicopter Manager) is allowed on board during external load operations, provided certain conditions exist or are met. See Chapter 10, Section IV for further information.

V. Hazardous Materials Transport and Handling.

A list of hazardous materials is contained in 49 CFR 172.101, Department of Transportation, Hazardous Materials Table. Some hazardous cargo may be transported via helicopters under special conditions. See 49 CFR.

A list of common hazardous materials, along with the correct transportation procedure for each, can be found in the *Interagency Aviation Transport of Hazardous Materials Guide/ Handbook* (for USFS and OAS), or in local or state agency policy.

A. Exemptions.

USFS and DOI both have an exemption granted by the United States Department of Transportation (DOT). It exempts USFS and DOI from certain hazardous materials regulations, provided that the materials are transported in conformance with the *Interagency Aviation Transport of Hazardous Materials Guide*/Handbook [1] If an agency does not have an exemption from DOT, then all materials must be transported in accordance with 49 CFR Parts 171-175.

B. Requirements.

- Aviation transport of hazardous materials must conform to procedures contained in the *Aviation Transport of Hazardous Materials Guide or Handbook*.
- Personnel, including vendors, who engage in the transport of hazardous materials via aircraft must have been trained in Hazmat. They must carry a current letter of exemption, an *Interagency Aviation Transport of Hazardous Materials Guide or Handbook* and an *Emergency Response Guide* on board the aircraft at all times.

C. Transport and Handling During Law Enforcement.

See Chapter 16.

VI. Cargo Transport with Military Aircraft.

External sling load missions may not be possible or practical for all military helicopters for the following reasons:

- Military helicopters may not be equipped with cargo hooks.
- The sling equipment currently used by civilian fire agencies may not be readily adaptable for use on military equipment.

If military helicopters are tasked to perform external cargo transport, use military sling equipment and qualified military personnel. Military personnel engaged in external load operations must be furnished with and wear personal protective equipment according to the requirements found in Chapter 9, Chart 9-2.

[1] USFS and OAS publish aviation hazardous materials transport directives. However, with the exception of references to the agency name, language and procedures are the same. The directives are also based upon the same exemption granted these agencies by the United States Department of Transportation. Local and state agencies may have similar direction.

For aviation operations using Active Duty or Reserve Military helicopters, and National Guard units officially "federalized," refer to Chapter 70 of the *Military Use Handbook* for specific policy and procedural information.

The use of National Guard units for federal firefighting purposes within their state must be outlined in national, regional, state or local agreements and Memorandums of Understanding (MOUs) between federal agencies and the specific National Guard units.

VII. Cargo Preparation.

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

A. Pilot Approval.

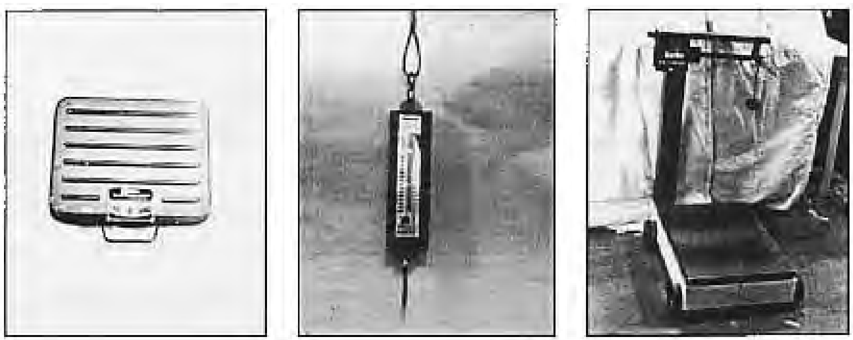
Obtain Pilot approval of all cargo to be transported. Loadmasters and other personnel loading cargo must always inform the Pilot of:

- Hazardous material(s) being transported;
- Packaging of the hazardous material. Has it been correctly packaged and placed in the helicopter in conformance with the Interagency *Aviation Transport of Hazardous Materials Guide or Handbook* or 49 CFR Parts 171-175?

B. Weighing.

Exhibit 11-1 shows various methods of weighing cargo. Portable scales can be easily set up at remote helibases and helispots. Weigh cargo and inform the Pilot of actual weights. DO NOT EXCEED ALLOWABLE PAYLOAD. If possible, have the cargo weighed, packaged, and marked for destination prior to the arrival of the helicopter.

Exhibit 11-1: Different Types of Scales For Weighing Cargo



C. Methods of Identifying Cargo Destinations.

When a cargo transport operation involves multiple drop off locations, each cargo load should be marked with its destination to ensure it reaches the correct location.

The following are suggested methods:

- Lay out separate cargo areas for each helispot. Identify these areas with markers: “H1”, “H2”, etc. Note that these do not have to be separate cargo pads.
- At the minimum, have the Loadmaster or Supply Unit mark destination clearly on the cargo using a heavy marker, or tag each piece.

VIII. Equipment Inspection.

Prior to the operation, the Helicopter Manager, Loadmaster, or other responsible person should inspect all equipment (e.g., leadlines, swivels, nets, cargo racks, tie-down straps) in accordance with the procedures found in Chapter 9.

IX. Cargo Inspection.

Prior to the operation, the Helicopter Manager, Loadmaster, or other responsible person should inspect all cargo. Inspection should include, as applicable, the following:

- Liquid containers should be boxed or secured in an upright position.
- Boxes should be taped shut and all items tied down or secured, including Sigg and other fuel holding containers.
- All backhaul garbage should be double bagged in plastic garbage bags to prevent leaks inside the aircraft. Garbage may be hauled externally in cargo lift bags or in a net with protective covers such as a burlap sack.
- Cargo should be secured by restraining straps or nets constructed of synthetic webbing; straps or nets should be attached to cargo rings or attachments points specifically designed for restraining purposes.
- Hazardous materials should be marked and the Pilot aware of the items being transported. Transportation of these materials must comply with the Interagency *Aviation Transport of Hazardous Materials Guide or Handbook* or 49 CFR Parts 171-175.
- Avoid transporting liquid hazardous materials, such as gasoline, with food or personal gear.
- Consider putting personal gear and packs in plastic bags if transporting with other non-hazardous liquid containers and tape the neck of the plastic bags to prevent the plastic from ripping in transit.
- Ensure that sharp tool edges are covered by tool guards or tape to protect the cargo net or other container.

- If multiple loads are to be transported, tag each load with its weight and destination.
- If using the carousel hook system (see Chapter 9), make sure the Pilot is aware of the destination sequence.

X. Establishing the Loading Area.

Chapter 8 provides some general guidance on establishing loading areas. Refer to Chapter 15 for more detailed information.

XI. Loading and Rigging Procedures.

A. Internal Cargo.

- All internal cargo shall be properly stored and secured, regardless of whether passengers are being transported with the cargo.
- All packs must be secured if carried in the passenger compartment. Packs shall not be carried unsecured in a passenger's lap or on the floor. Packs can be stored separately in the cargo compartment, in external cargo racks or transported in an external sling.
- Do not exceed the weight limit of the cargo compartment or racks. This weight should be placarded within or outside the compartment, usually on the door. If in doubt, ask the Pilot.

B. External Cargo Racks.

- Do not exceed the weight limit for a cargo rack or basket. This weight should be placarded on the rack. With certain makes and models of helicopters with racks on either side, the weight limitation for one may differ from that on the opposite side.
- Cargo should be loaded within the center of gravity (CG) of the aircraft as computed by the Pilot.
- Inspect tie-down devices for rips, tears or cracks.
- When securing cargo in the racks, start at the front of the rack and lace the tie-down strap or bungee cord through pack straps or handles on containers or equipment toward the rear. This will eliminate the possibility of items coming loose from the rack and potentially interfering with the tail or main rotor.

C. Proper Rigging Methods for External Cargo.

- The importance of inspecting equipment prior to rigging cannot be over-emphasized. Chapter 9 contains information on both commonly used and specialized external load equipment.

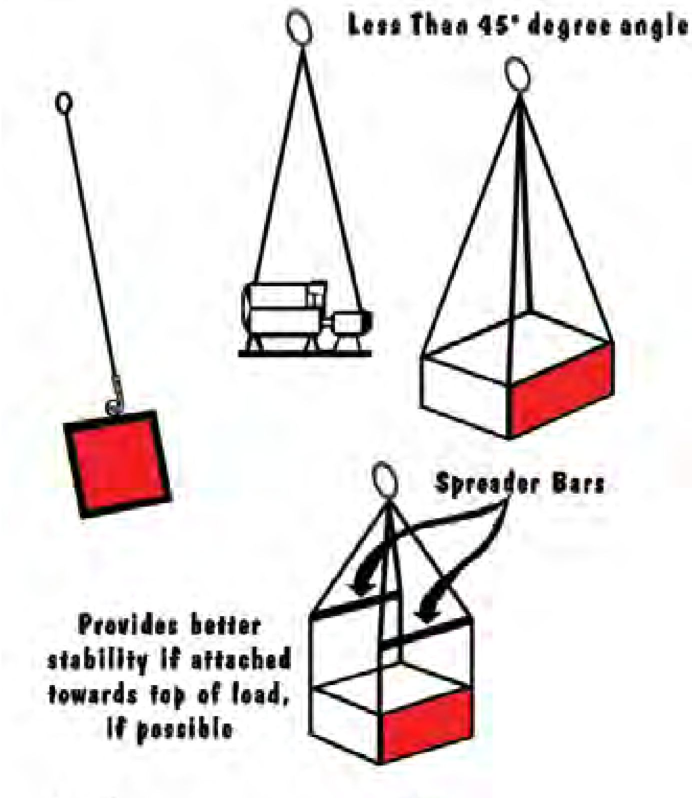
- Ground personnel and Pilots should be thoroughly trained and briefed on rigging and hand signals.
- Personnel should never stand under a load, or between the load and an immovable object, when working around operating helicopters.
- When working with unstable loads, personnel should avoid placing hands in an area where they can be caught in rigging.
- EVERY load gets a swivel to avoid line twisting. When building loads using multiple nets, a swivel should be in place for each net.
- With loads comprised of multiple nets, the fragile or lighter loads may be rigged above or below the heavier loads. Consult the Pilot regarding rigging preferences.
- It is acceptable to use a longline without a remote hook, provided that qualified personnel are available at both ends of the operation and that the cargo is attached at the bottom of the longline using a swivel.
- Some specialized loads, such as helitorches or buckets, may be flown without swivels.
- Fiber taping or securely strapping rigid water tanks into the closed position will prevent them from opening in flight.
- A single-point sling (choker strap) is not normally the best method to carry a load, except for items such as logs.
- A two-point sling with less than a 45 degree angle to the hook or longline is the common method for most loads that will not fit into a cargo net. See Exhibit 11-2.
- Use a four-point sling for box-like loads. See Exhibit 11-2.
- A spreader bar is useful for stabilizing a load, or where the sling may catch or damage the load if attached conventionally. See Exhibit 11-2.
- Properly rolled and secured, empty cargo nets may be flown on the cargo hook, leadline, or a longline. The forward motion of the helicopter may cause the net to trail and drift up towards the tail, with potential to become caught in the tail rotor. Leadlines with empty cargo nets should be shorter or much longer than the distance between the cargo hook and the tail rotor.
- Certain loads such as vehicles, crashed aircraft, and other irregular loads, require special rigging including the use of drogue chutes or spoilers. Never attempt to build such loads without prior training and/or experience.
- The aerodynamic configuration of a load may cause it to spin and oscillate, which in turn may cause the Pilot to experience control problems with the helicopter. Such difficulties may cause the Pilot to return with the load for re-rigging, or, in extreme cases, to release the load, either intentionally or inadvertently.

- There is no way to predict how each load will fly. This is especially true of non-standard loads such as large water guzzlers, cement mixers or pipe. Consult with the helicopter vendor or Pilot, who may be able to supply the necessary expertise and/or equipment.

- If a load does not fly well, rig the next load differently and try again, provided there are no safety issues. If safety will be compromised, other means of transportation should be found, such as ground vehicle, pack train or paracargo.

> REMEMBER: The Pilot always has the final say regarding whether or not to conduct the mission. Do not pressure the Pilot, either implicitly or explicitly, into flying a load with which he or she does not feel comfortable.

Exhibit 11-2: Single-, Two-, and Four-Point Loads



1. **Cargo Net**.

Some considerations when working with cargo nets:

- Center the weight and make the load as symmetrical as possible. Place heavy items in the center of the net first, with light items on top.
- Do not weave purse strings through the net. The net will not cinch properly and will be exposed to excessive wear.
- Pull tension on the purse string(s). If the net has two encircling lines, both should be made even in length before attaching the leadline or swivel.
- After the net is secured, look for holes or openings where items could slip through.
- If a leadline is necessary, attach a swivel between the leadline and the cargo hook. See Exhibit 11-13.
- A swiveling cargo hook may be used in place of a separate swivel on some missions such as bale bombing.
- The recommended way of carrying multiple nets on one longline is to have one attached to the cargo hook by a leadline (and swivel!) so that it rides below the other. See Exhibit 11-13.
- Tag each load with destination and total weight of load, including net, swivel and other accessories.

CAUTION: Use of a net with a tarpaulin spread inside is prohibited due to the potential for the tarpaulin or other covering to slip out and become entangled in the rotor systems or airframe.

2. Cargo Hook/Ring Interface.

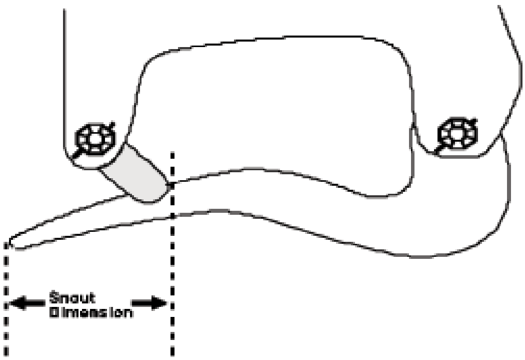
The connection between the cargo hook and the swivel or leadline ring is a critical interface. Loads can be inadvertently dropped, or can be non-releasable, due to incorrect connections. See Exhibit 11-3.

The size or shape of the ring is a significant factor in inadvertently released loads. Personnel should be aware of the following:

- When the ring maximum inside diameter is greater than the “snout” dimension on the cargo hook, there exists a small potential for the ring to ride over the load beam and inadvertently release from the cargo hook. See Exhibit 11-3.
- Ring shapes other than a circle (e.g., oval- or pear-shape) pose the greatest chance of inadvertent release. However, such release is rare for any rings when properly placed on cargo hooks.

- Use of a swivel reduces the chance of a hung load by limiting the torsional load that can be applied to the ring. Refer to Exhibit 11-4 for incorrect methods of hooking loads.

Exhibit 11-3: Snout Dimension On a Cargo Hook



3. Box-Like Loads.

   Box-like loads usually fly very poorly, as they tend to spin. Use a “tail” (e.g., tree branch) as shown in the exhibit. Ensure the tail is well-secured to the bottom of the load. See Exhibit 11-4.

> CAUTION: Use of drogue chutes is prohibited except by trained, experienced personnel. Drogue chutes will only be used on longline loads.

4. Pipe.

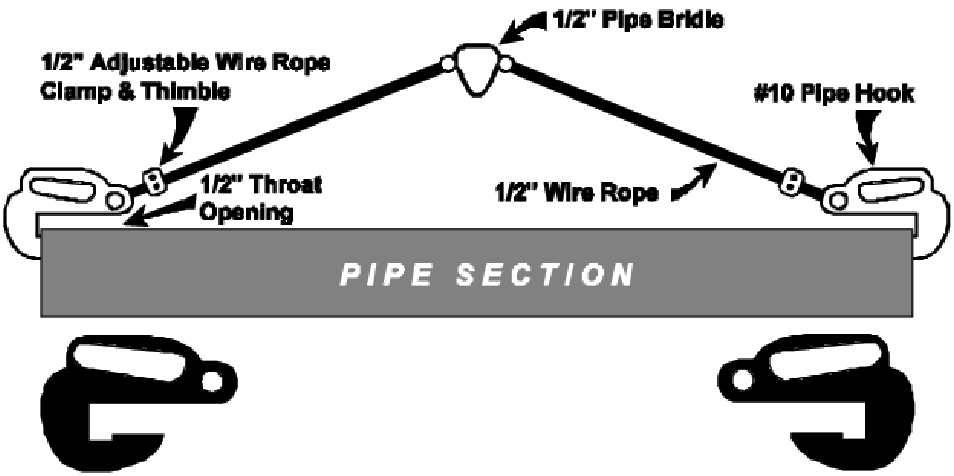
   Pipe shackles or hooks allow a number of pipes to be carried. See Exhibit 11-5.

   Use of chains as the connecting lines will work for loads of a weight that Type 3 helicopters can carry. They are easier to store than cables. However, for loads over 1,000 pounds, chains can bind where they cross and fail to tighten, allowing pipes to slip out. This is especially true if the load spins.

   Cables are better, although they have to be replaced when they become kinked. Using a leader will require replacement of only a short length rather than the entire cable.

Exhibit 11-4: Rigging A Box-like load with a Tree Branch as a Tail

Exhibit 11-5: Rigging Loads of Pipe



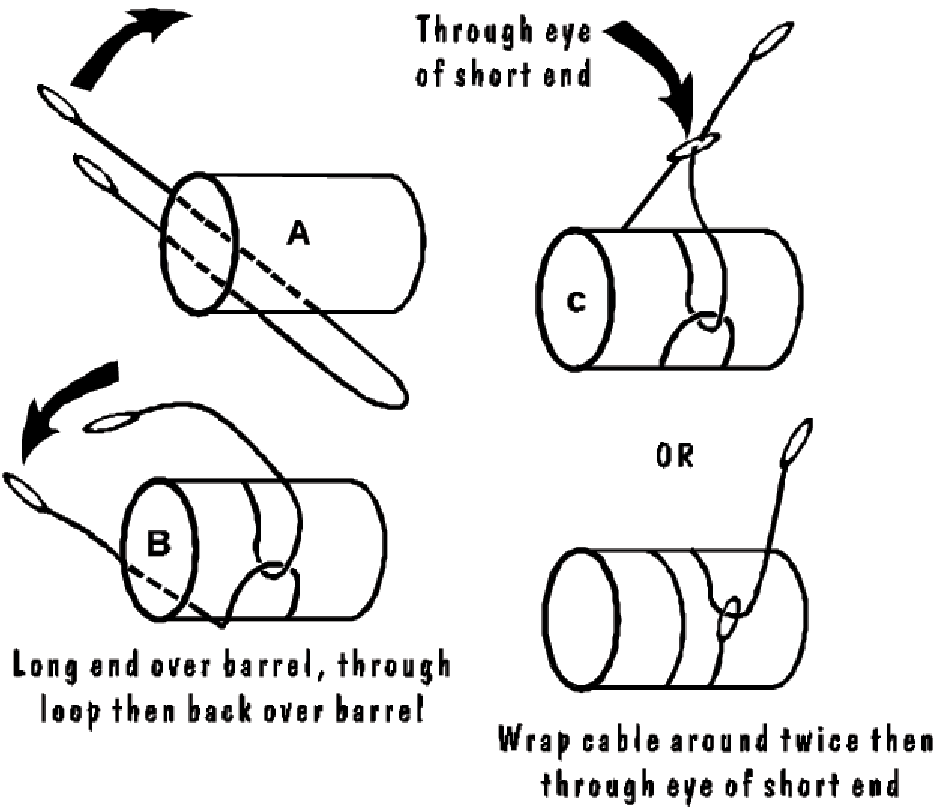
CAUTION: Ensure the shackles are hooked on opposite ends of the same pipe.

5. Barrels.

Barrels may be rigged by using a choker as depicted in Exhibit 11-6 or by using barrel hooks or clamps designed specifically for that purpose.

Use the method shown below if barrel hooks are not available or are not preferred. Barrel hooks are made of chain or cable. Two sets are usually used together. A bungee cord with a clip on one end allows the hooks to be dropped off the barrels on touchdown at an unattended landing site.

Exhibit 11-6: Rigging Barrels Without Barrel Hooks

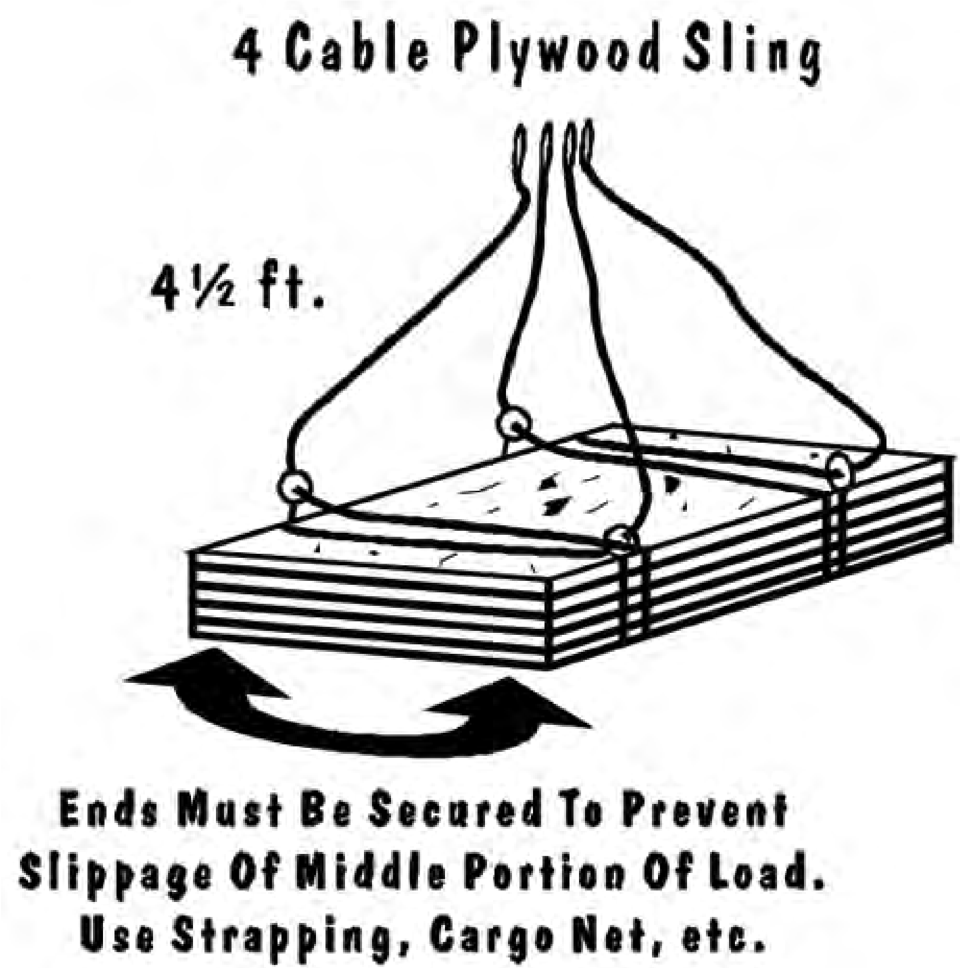


6. Plywood or Lumber.

Plywood and lumber are one of the hardest loads to transport because the load's wing-like shape often causes the load to fly, unfortunately often in a direction independent of the helicopter's intended flight. See Exhibit 11-7.

CAUTION: Use an end stop to prevent pieces on the interior of the load from slipping out. Ensure the material is well-secured to the stack itself.

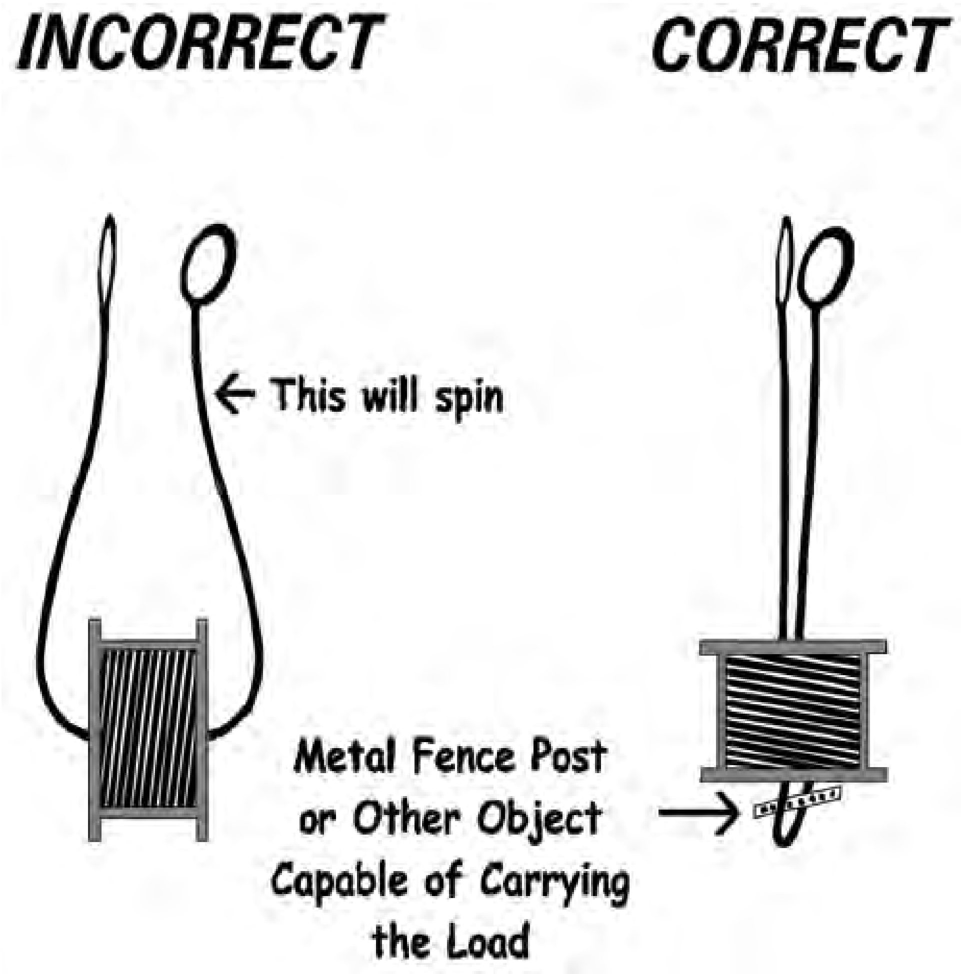
Exhibit 11-7: Rigging Plywood or Lumber Slings



7. Wire Spools.

The material shown in the illustration below must be fastened securely to the bottom of the spool, while allowing room through which to loop the choker. It should be dimensionally strong enough to bear the weight of the spool when tension is applied. See Exhibit 11-8.

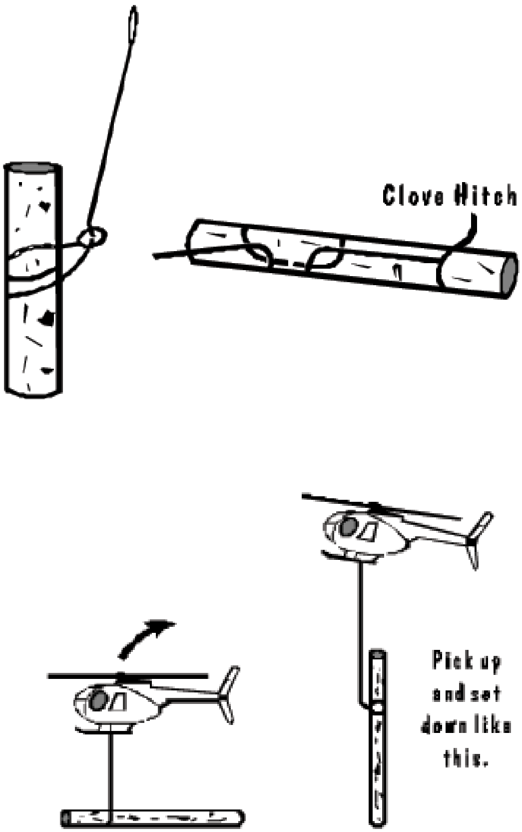
Exhibit 11-8: Rigging Wire Spools



8. Poles and Logs.

Logging operations use a cable choker where a ball on the end clips into a sliding catch further up the cable. The cable then “chokes” down on the log when it is under tension. If this equipment is available, use it. See Exhibits 11-9 and 11-10.

Exhibit 11-9: Rigging a Single Pole or Log For Flight



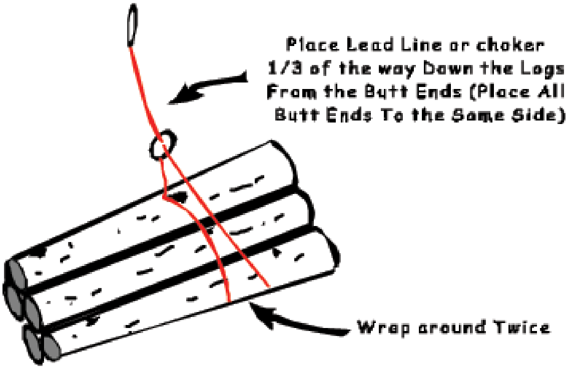
CAUTION: Use of a single choker vertically in a straight line (that is, without one end being looped through the other end), or in a “basket,” U-shaped configuration, is not approved.

For pole setting, a clove hitch can be used (two half- hitches back to back) at the bottom of the pole. Run the rope up to the top and make a half-hitch.

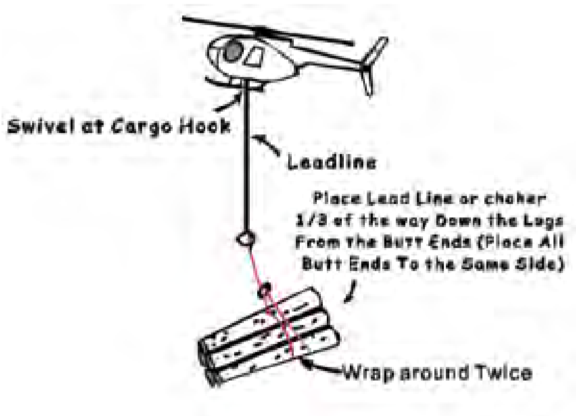
When the load is placed on the ground, the sling will loosen and can be easily removed by ground crew. A remote hook can be useful for releasing chokers, or when you want to retain the lead or longline.

To keep the load from slipping out, wrap the rope or chain twice around the end of the pole when carrying a single pole or log, as shown in the illustration in the exhibit above.

Exhibit 11-10: Rigging Multiple Poles or Logs for Flight



NOTE: Multiple poles or logs can be wrapped with heavy wire. Attach the wire to each log with fencing staple and use a choker 1/3 of the way from the end of the logs.



CAUTION: With multiple-log loads, use an end stop to prevent interior logs from slipping out. Ensure the material used is well secured to the stack itself.

XII. Hookup Methods.

There are four methods of hooking up loads to the helicopter for transport. These are:

- Hookup while the aircraft is on the ground.
- Hover hookup attaching the rigged load directly to the cargo hook (no leadline).
- Hover hookup using a leadline.
- Hover hookup using a longline with a remote electric hook or carousel.

A. Preparation for the Hookup.

Basic tasks that should be performed prior to performing any external load operation include the following.

- Prepare by removing any items from the helicopter that are not essential.
- If requested, assist the Pilot with the removal of all or any doors and store in a safe location at the Pilot's direction.
- Check both the rigging of the load and the external load equipment according to the requirements and guidelines discussed in Chapter 9.
- Attach the load to a swivel. Use of a swivel is required in most cases. Attach the swivel to the cargo hook or leadline. If using a longline with remote hook, attach the swivel to the remote hook.

B. Hookup with Helicopter on the Ground.

This method is usually used when the helicopter is shut down, and involves the least amount of risk to those involved.

The Pilot should be present when hooking the load to the aircraft. Once the load is ready, perform a two-point hook check.

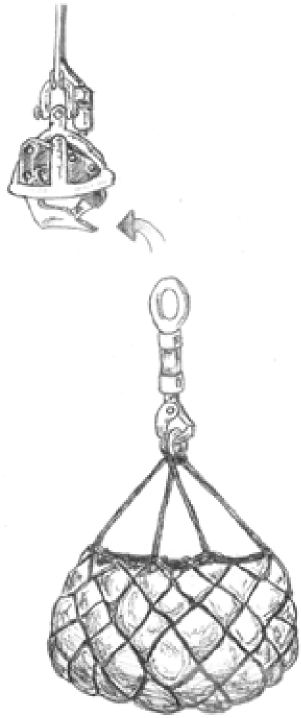
- Pilot checks manual release to the cargo hook.
- Pilot checks the electrical release to the cargo hook.
- Check the electrical function of the mission equipment (for example, water bucket release, remote electric hook release, helitorch pump, etc.).
- Run the leadline from the load swivel to the cargo hook, ensuring that the line is not near or looped over any skid.

It is important to test the manual release first before the electrical release. This sequence is necessary because the manual release is usually a cable susceptible to snagging or incorrect rigging.

Some operators want to test the manual release only once per day as more checks may put undue wear on the release. If this is the case, those manual releases may be checked one time per day.

After all checks have been performed, visually inspect the cargo hook to ensure the release arm or knob is fully reset.

Exhibit 11-11: Attaching Swivel to Hook



C. Hover Hookup with No Leadline.

This method involves attaching the load directly to the cargo hook.

The method has disadvantages. There may not be enough slack in the net's perimeter lines to allow the hookup person to attach the load on the cargo hook easily. In extreme cases, the helicopter may have to descend almost on top of the load itself.

D. Hover Hookup with Leadline. See Exhibit 11-12.

Hover hookups with leadline are effective:

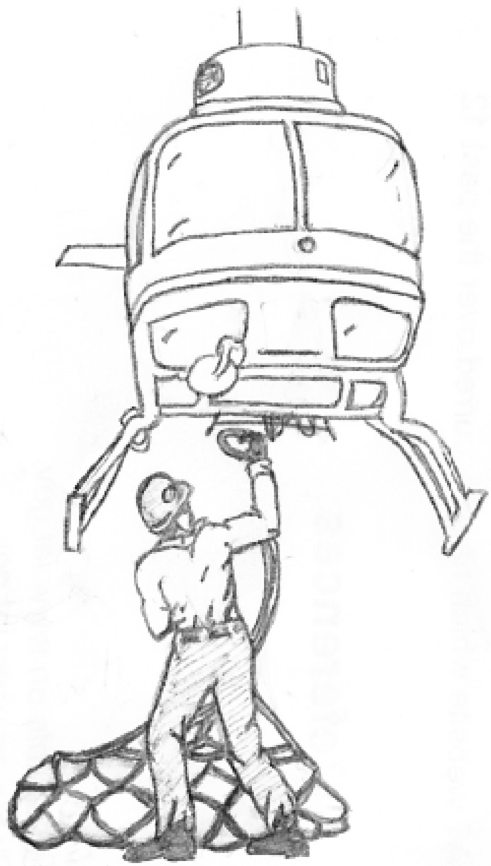
- When multiple loads need to be transported in a short time frame.
- When the load destination involves terrain on which the helicopter is unable to land.

To determine when and how to use a leadline, consider:

- Pilot preference on length of leadline.
- Cargo to be transported.
- Terrain and surrounding vegetation at the destination or takeoff point.

Additional leadline lengths may be necessary for bulky loads, when doing special projects, or when the hookup person underneath the helicopter may need additional length to perform the hook-up. If the pilot is not carded for vertical reference, the bottom of the load should not be more than 50' below the cargo hook.

Exhibit 11-12: Performing a Hover Hookup with Leadline

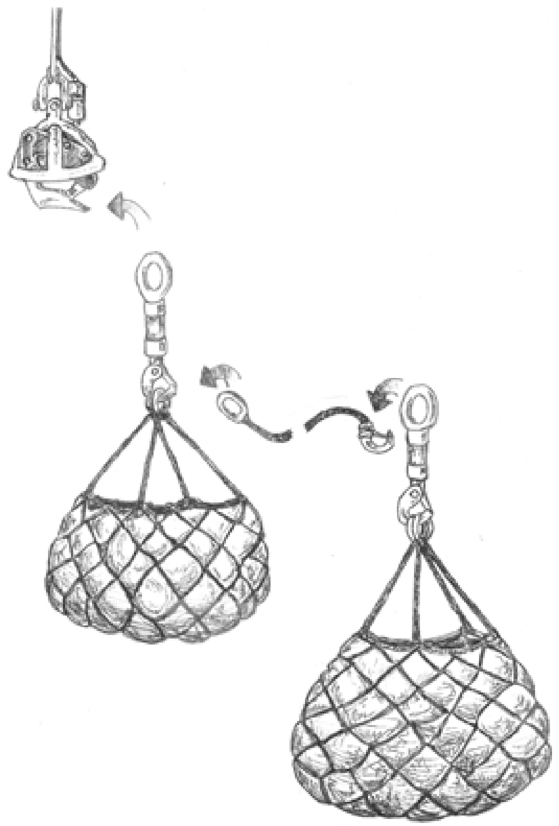


E. Hover Hookup with Longline and Remote Electric Hook.

Hover hookups with longline and remote electric hook are effective:

- When multiple loads need to be transported within short time frames.
- When the load is on terrain on which the helicopter is unable to land or take off.
- When the surrounding vegetation and/or terrain is such that the helicopter is unable to perform a hover hookup with a standard length of leadline.
- When ground personnel are not at the receiving site.
- Use of a longline with remote electric hook carousel allows the Pilot to place loads at different locations during the same mission.

Exhibit 11-13: Daisy Chain Configuration



XIII. General Requirements for External Load Missions.

A. Required Personnel.

1. Hookup with helicopter on the ground. Only one person is necessary for this type of operation, since the Parking Tender can accomplish the hookup, then exit and perform marshalling duties.
2. Hover hookup. Only trained and qualified personnel shall perform hover hookup operations. It is recommended that two individuals perform the operation, a Parking Tender and a hookup person.
3. Longline with remote electric hook. Two people are recommended, a Parking Tender and a hookup person. If circumstances dictate, one person may perform the operation, provided there is positive air-to-ground radio communication between the Pilot and the individual performing the hookup.

B. Radio Communications.

For operations where radio communication is recommended or required, a secure or discrete operating frequency should be established, radios checked during the briefing, and ground contacts identified. Pilot shall receive radio communications from only one person.

1. Hover hookup with or without leadline. For hover hookup operations with or without leadline, it is recommended that the Parking Tender be equipped with a radio. Use of the flight helmet adapter to a handheld radio is optimal, though a headset worn beneath a hard hat, with adapter to a handheld, will work.
2. Hover Hookup with Longline and Remote Electric Hook. Radio communications between the Pilot and Parking Tender or hookup person is required.

C. Briefings.

A pre-mission safety briefing must be conducted with the Pilot, Parking Tender, and hookup person. Hand signals and emergency procedures are an integral part of this briefing.

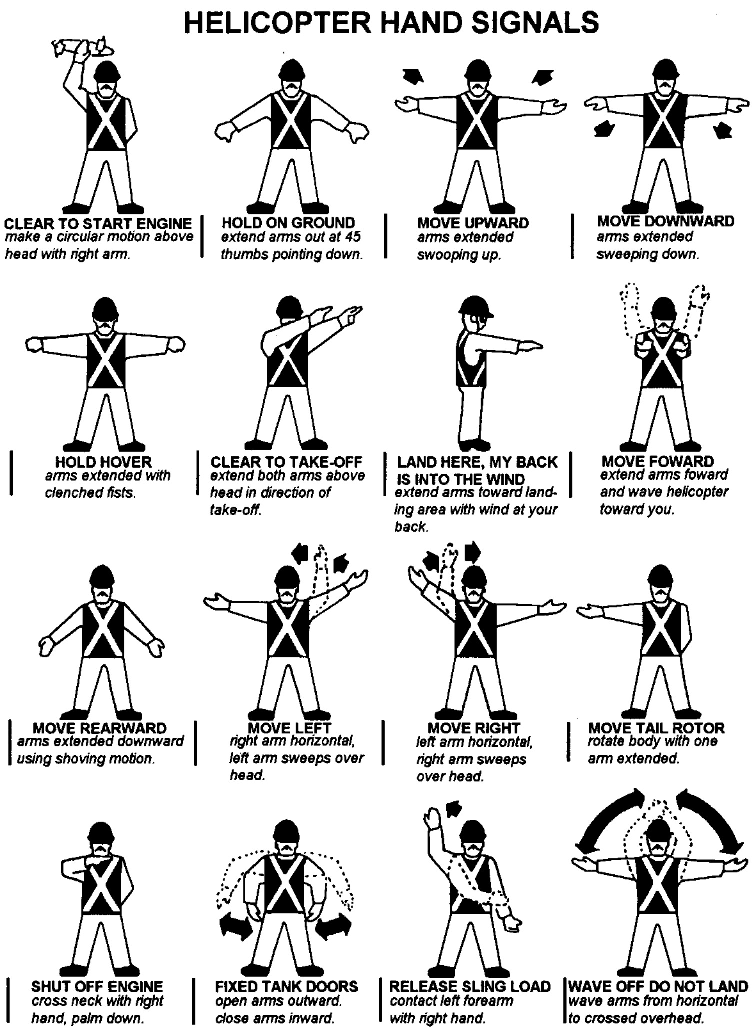
1. Helicopter Hand Signals. See Exhibit 11-14. Standard hand signals shall be used.

   Although there are rare instances where terrain dictates the need for two individuals to give hand signals, the Pilot should normally receive hand signals from one person. Ensure that the ground crew and Pilot are thoroughly familiar with standard signals. For hover hookups, these should include:

   - The helicopter's height above the hookup person (accomplished by using the Move Downward signal).
   - Indication that the helicopter should hold while the hookup person leaves the area (Hold Hover signal).

- Indication of load clearance (accomplished by using the Move Upward signal).
- Clear to take off (Clear to Take Off signal).

Exhibit 11-14: Standard Helicopter Hand Signals



2. Emergency Procedures. Prior to hover hookup operations, emergency procedures must be established between the Pilot and ground crew. The emergency briefing is usually presented by the Pilot and addresses procedures in the event of a mechanical failure.

   - The Pilot should indicate that the intent will be to move the helicopter away from the hookup person underneath the aircraft. Generally, this will be to the Pilot's side of the helicopter, but confirm this with each Pilot.
   - The hookup person should move in the opposite direction from that of the helicopter, or fall flat next to the load and attempt to gain as much protection as possible.

D. External Load Operations.

1. The performance of external load missions must be contingent upon proper assessment and preparation of the delivery site by first mitigating hazards.
2. The selection of dip/snorkel sites may require concurrence of agency personnel such as resource advisors. While it may not be feasible to approve every dipsite, check first.
3. In areas of sloping terrain or with obstacles rising to one or more sides of the cargo pickup/delivery area or dipsite, the pilot shall maintain rotor clearance from all obstacles equivalent to the Chart 8-1 landing area safety circle requirements.
4. When obstacles present a risk of contact with aircraft or rotor blades, the pilot should decline the mission until hazards are removed, additional line can be added, or a better location can be identified. Pilots have the final say in accepting or declining any mission.
5. If the helicopter is within ½ rotor diameter of the highest obstacle, the pilot should consider adding another length of line.

E. Personal Protective Equipment.

See Chapter 9, Chart 9-2.

F. Equipment.

Check equipment according to procedures in Chapter 9. Check serviceability or general condition of equipment. Check the load-carrying capacities of nets, leadlines, swivels, etc.

G. Grounding.

Static electricity may present a problem to the hookup person when attaching loads to hovering helicopters. Allowing the remote hook to touch the ground, use of rubber gloves, grounding the load to the helicopter skid prior to attaching to the cargo hook (never touch the skids or any other part of the helicopter without the Pilot's permission), Pilot keying the radio prior to the hookup person attaching the load, etc, are ways to reduce static shock.

Unfortunately, there is no method that ensures that the hookup person will not receive some amount of electrical shock when the swivel touches the hook.

XIV. Procedures for Hover Hookups.

A. General.

These are standard procedures for any hover hookup, regardless of whether a leadline or longline is used.

- The load should be placed in front of the helicopter skids, with no potential for lines to become snagged over the skids.
- The cargo net's perimeter lines should be drawn over the top of the load and laid so that the lines and leadline are prevented from becoming entangled in the net during liftoff.
- The Parking Tender should direct the Pilot by radio or standard hand signals. Placement of loads carried by longline and remote electric hook may be done independently by the Pilot if no ground personnel are available.
- The Parking Tender should be far enough back of the load to remain visible to the Pilot at all times.
- The Parking Tender should be slightly to the side of the load so that they can maintain visual contact with the Pilot. For helicopters that are flown from the right seat, the Parking Tender should be approximately at the Pilot's "2 o'clock" position.
- The Parking Tender should wear a non-flammable, high-visibility vest to distinguish him or her from other personnel on the deck.
- Measures to prevent static electrical shock may be taken by the hookup person and the Pilot, once agreed upon.
- After the hookup is completed, the hookup person should exit from underneath the helicopter to the front and in full view of the Pilot and proceed to a position that is not in the departure path of the helicopter. Always keep the load between you and the helicopter.

CAUTION: When exiting, the hookup person should take care not to become entangled in either the line or the load. WALK, DO NOT RUN.

- When the hookup person is clear, the Parking Tender may signal the Pilot to begin moving the load. The Parking Tender must pay close attention as the helicopter lifts and tension is applied to the line. An improperly rigged or placed load can become snagged at any time. If the load becomes snagged or is improperly rigged or hooked, the Parking Tender must communicate this to the Pilot using the radio or hand signals.
- The hookup person should remain ready to take direction from the Parking Tender

should the load or line become snagged.

CAUTION: The hookup person should never re-enter the load area beneath the hovering helicopter unless the Parking Tender directs the hookup person to do so, and the pilot is aware of the person's movement.

The hookup person should never attempt to re-rig a load when tension is still applied to the load by the helicopter. Hands, arms, or other parts of the body could become snagged in the load, causing serious injury.

Water buckets and longlines should be attached to the helicopter while it is on the ground and NOT hover hooked/plugged.

Hover hookups to connect electrical power accessories should not be performed. If an electrical connection is loose or not functioning, the pilot should land and rectify the problem.

B. Longline and Longline with Remote Electric Hook Procedures.

Considerations and requirements for longline with remote electric hook operations include:

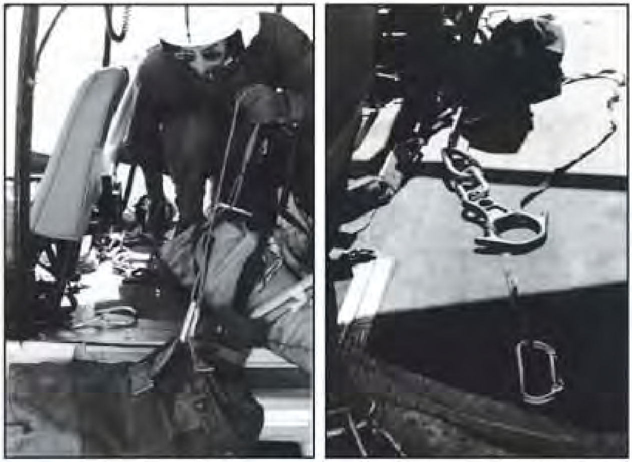
- The sling load should be placed on the ground in the center of the loading area.
- On approach, the signal person should advise the Pilot on load clearance from trees, load height above the ground, and any problems that might arise in the pickup or drop zones.
- For safety purposes, the hook should be placed next to the load. The hookup person should not be next to the load at the time the Pilot is placing the hook.
- 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.
- When attaching a load to the remote electric hook, the hookup person should allow the hook to contact the ground before touching it. This grounds the hook and eliminates the possibility of shock from static electricity.
- When attaching a load to a remote hook, take the remote hook to the swivel rather than taking the swivel to the remote hook. This ensures positive control of the hook.
- The hookup person hooks the load to the remote electric hook and leaves the area. On approach or departure to the remote hook, the hook-up person shall not step over the longline when attaching the load.
- Helicopter is then positioned above the load and the load is lifted from the ground and flown out.
- When receiving a load, stay clear of the landing area. Let the Pilot set the load on the ground and release it before entering the area. On approach or departure the hookup person shall not step over the longline when detaching the load.

XV. Cargo Letdown

Cargo letdown is a system that allows the controlled descent of lighter cargo loads (water containers, chain saws, backpack pumps, etc.) from a hovering helicopter into areas that preclude landing. See Exhibit 11-15.

For equipment and training requirements and procedures, refer to the *Interagency Helicopter Rappel Guide.*

Exhibil11-15:Cargo Letdown Option



XVI. Cargo Freefall.

The freefall of cargo from a helicopter is another method of delivering cargo to an area where conventional delivery methods will not work.

Rations and other durable items, as well as more fragile items, can be dropped by freefall when properly packaged. Larger loads can be delivered by releasing the cargo net from the cargo hook at a minimum safe altitude and air speed. Drops must be made a safe distance from personnel on the ground.

A. Required Personnel.

All Helicopters. Minimum aircrew will consist of pilot and spotter (spotter will conduct dropping operations). The spotter should be a qualified Helicopter Manager for freefall cargo operations. Some missions may require additional personnel.

B. Criteria For and Situations When Cargo Freefall May Be Used.

Freefall of cargo should only be done after the following criteria have been met and in the following situations:

- The helicopter cannot land safely and the mission has been determined to be tactically essential.
- Other methods of cargo transportation have been considered and cargo freefall has been determined to be the most efficient and economical method.
- A helicopter load calculation has been completed using the helicopter hovering out of ground effect chart. Consideration must be given to weight of cargo and maintaining center of gravity limits.
- There is adequate clearance from obstructions in the flight path and at the drop zone.
- All personnel involved have been thoroughly briefed. This will include the Pilot, spotter, dropper, and all ground personnel.
- Positive air-to-ground communications are established.

C. Planning for the Drop.

The operation is conducted in two phases. Planning prior to the drop is the first phase.

1. Compliance with Aircraft Flight Manual. All procedures will comply with the aircraft manual (for example, door removal).
2. Line of Authority. The Pilot and spotter must know the contact at the drop zone. The person at the drop zone must be aware of the mission and have established a drop zone.

3. Selection and Packing of Cargo. Packing will depend largely on what materials are available. Cargo must be selected and packed to prevent undue damage.

   a. Little or no packing required. Items that require little or no packing include:

      - Fire hose and sleeping bags. These must be banded with rubber bands, straps, or filament tape. Ends of the hose should be coupled to prevent damage.
      - Hand tools. These should be taped together with heads protected and appropriately packaged (for example, padded with several layers of cardboard).
      - Rations.

   b. Packing of fragile or items. Without access to large quantities of packing material, the only fragile items that are practical to drop are water, batteries, and other inexpensive items. Fragile items will have to be appropriately packaged to prevent damage. It is suggested that bases intending to use cargo freefall stock packing material and boxes both at the base and in the helicopter chase truck.

4. Equipment Required. An approved restraint harness fastened to a hard point must be worn by any individual (spotter and/or dropper) who will not be normally restrained by a seatbelt. The tether must be adjusted so that the individual cannot break the plane of the doorway.

5. Selecting the Drop Site. When selecting the drop site, consider the items you are delivering and at what height you will have to release them. Site selection is not as critical for items such as tools or sleeping bags which can withstand more impact.

   Fragile and breakable items such as radios and power saws require special consideration. Look for areas where a lower drop can be accomplished. If available, a patch of brush serves as a good cushion.

D. Drop Procedure.

The following procedures must be followed.

1. Air-to-ground communications shall be established before drop zone is selected.
2. The drop zone shall be identified on the ground (marker, ribbon, flagging).
3. Two reconnaissance runs, one high-level and one low-level, shall be made over the drop zone.
4. A high-level reconnaissance of the drop zone shall be made to determine:
    - If the drop is feasible at the selected site.
    - That ground personnel have moved a safe distance out of the drop zone.
    - Wind conditions, including direction and speed.
    - Location and nature of ground and aerial hazards.
5. A low-level reconnaissance of the drop zone shall be made. At this time, the Pilot and dropper shall:
    - Reconfirm hazards in the drop zone
    - Determine approach and departure routes.
    - Check for personnel too near the drop zone and/or approach-departure path.
    - Confirm with the ground contact that the area is clear.
    - Make final check of cargo to be delivered.
    - Both agree to proceed.
6. On the drop pass, the cargo will be delivered if there are no changes in conditions.
    - Remember to anticipate the forward speed of the helicopter.
    - Drop cargo laterally out and away from the helicopter and not toward the tail rotor or skids.

CAUTION: Do not hesitate to suspend dropping operations when conditions are marginal or unsafe.

CHAPTER 12: FIRE PROTECTION AND CRASH RESCUE.

I. Introduction.

Despite the best efforts of all involved in helicopter operations, it is recognized that accidents can and do occur. Even with the limits inherent in operating at remote helibases, an accident demands an immediate and correct response to prevent serious injury or property damage.

The purpose and objectives of this chapter are to provide safe, cost-efficient, and effective fire protection and crash rescue procedures for incident and project helibase operations. It prescribes minimum firefighting and crash rescue operating requirements.

The guidance and requirements in this chapter are not intended to cover every contingency, nor does it detail every rule of crash rescue safety and practice. Specialized, basic aircraft firefighting training should be sought to supplement the information contained herein.

It is not the intent of this guide, or of most agencies involved in helicopter operations, to train helicopter and helibase management personnel to respond to a fully-involved aircraft fire. The intent is to train personnel to respond to small fires within their capability and training, and to be able to rescue survivors of a crash in a safe, efficient manner.

To this end, it is recommended that personnel assigned to the positions of Parking Tender or Deck Coordinator be trained in the proper use of fire extinguishers and crash rescue tools for aircraft fires. This training should include practical exercises extinguishing several small Class A and B fires with different types of extinguishers.[1]

> CAUTION: Flammable liquids are classified as hazardous materials, and approved training facilities (for example, local fire departments) must be used for practical exercises.

II. On-Site Accident Preparedness Planning.

This chapter addresses on-site fire protection and crash rescue preparedness. Agency specific policy and directives usually require the local unit to develop an aircraft accident preparedness plan or aircraft emergency response guide. The unit preparedness plan usually addresses the large geographic area of a local unit's administrative boundaries, and is not site-specific.

However, some of the information required for site-specific accident preparedness planning at helibases should be available in the local unit preparedness or accident preparedness plan. Information commonly available in the local unit plan includes:

- Name and location of hospitals and burn units within or near the unit's administrative boundaries.

[1] The National Fire Protection Association video "Fighting Fires With Portable Extinguishers" (# NB-VC-31V) is recommended as a training aid.

- Name, location, and method of contact for helicopter ambulance services.

The Helibase Manager or other air operations staff must obtain this information and incorporate it into the site-specific plan. Specific checklists and forms have been developed to assist in on-site planning for emergency response and briefing Pilots on hazards. These include:

- Form HJA-4A, Emergency Rescue Information (becomes part of the Medical Unit Plan on incidents)
- Form HJA-4B, Emergency Medevac/Medical Transport Request
- Form HBM-10, Helibase Diagram
- Form HBM-2, Aviation Locations Summary
- Form HJA-1 Daily Helicopter Operations Briefing (Appendix F)
- Form HJA-2 Helibase Manager's Reminders List (Appendix H)

Use of these forms and checklists enhances the ability of the incident or project air operations staff to respond to an accident or other emergency in an organized, coordinated fashion.

The Crash Rescue Plan Checklist shown in Exhibit 12-1 asks very specific questions regarding the readiness of helibase and other personnel to respond to a crash rescue situation. It may be used by the Helibase Manager, Pilots, and other personnel, in conjunction with the other job aids mentioned, as a means of ensuring crash rescue preparedness.

Developing an accident preparedness plan for a specific site is not an end in itself, nor is it a guarantee that the emergency response will be effective. Preparedness must go beyond merely having a plan. Preparedness planning must be supplemented with briefings and drills to help reduce the confusion that often exists during crash rescue operations.

Exhibit 12-1: Crash Rescue Plan Checklist

CRASH / RESCUE PLAN CHECKLIST

1. Are the crash rescue equipment, fire extinguishers, and tool kits adequate?
2. Has the responsibility for the supervision of crash rescue activities been clearly defined?
3. Are crash rescue personnel assigned specific duties?
4. Can crash rescue equipment readily reach all portions of the helibase area?
5. Are helibase personnel familiar with procedures pertaining to crash rescue activities?
6. Have contacts and plans been made with cooperators for crash rescue assistance if needed?
7. Are crash rescue personnel instructed on the importance of not unnecessarily disturbing the aircraft wreckage for accident investigation purposes?
8. Are crash rescue personnel trained in first aid?

9. Have provisions been made to dispatch a second helicopter to the crash rescue scene for possible air evacuation?
10. Are fire suppression crews instructed to stand by while crash rescue helicopter is landing or taking off?
11. Do helibase personnel understand their specific duties?
12. Are minimum levels of crash rescue training completed for assigned crews?
13. Have the Pilots been informed of the crash rescue plan?
14. Are all helibase personnel briefed on the plan?

The effectiveness of crash rescue operations depends on:

- How well the planning for various known and unknown factors in the accident has been performed;
- How well those involved understand the plan; and,
- How well it is executed.

As a minimum, the helibase preparedness plan should address:

- Who will respond, by assignment
- What equipment and other facilities are available
- When the plan will be implemented
- Where equipment and medical facilities are located
- How the plan will be implemented (notification)

Form HJA-4A, Helibase Emergency Response Plan, will contain much of this information, once it is completed.

> NOTE: All plans must be reviewed and updated daily as conditions, resources, and/or other personnel on the operating base change.

III. Types of Emergencies.

Consideration must be given to the type of aircraft emergencies that might occur and where they might happen. Experience shows that few helicopter accidents occur on the helibase itself. Helibase personnel should be aware that they may also be involved in responding to a fixed-wing airplane accident, or to a ground accident involving vehicles and/or personnel.

The accident preparedness plan must include a comprehensive response to emergencies, regardless of where they happen or who might be involved.

Types of aviation emergencies might include, but are not limited to, the following:

A. In-Flight Emergency.

These types can include engine failure, fuel exhaustion, or dynamic flight component failure (for example, failure of the tail rotor).

Planning to cover these emergencies should include answers to the following:

- Are passengers being regularly briefed on in-flight emergencies?
- Have emergency landing areas near the helibase and on the incident or project area been identified and made known in the morning briefing?
- Are these areas accessible by ground or by the identified medevac aircraft?
- Are there limitations to ground access (bridges, gates) that will require that the entire response be by air?
- Has an emergency response team and aircraft been identified?
- Have helibase ground crews been briefed in the event the helicopter makes an emergency landing at the helibase?
- Have helispot crews been briefed in the event the helicopter makes an emergency landing at the helispot?

B. Fueling Area Emergency.

The most likely emergency in the fueling area involves fuel spills, with the potential hazard of ignition. Prevention measures are discussed in detail in Chapter 13.

Preparedness planning to cover these emergencies should include answers to the following:

- Are Parking Tenders aware of their responsibilities to have a fire extinguisher readily available during fueling operations?
- Is there a spill plan in effect for the area of operation, and is it known?
- Are spill notification procedures known (for example, to the local agency's hazardous materials specialist)?
- Are resources available to deal with a fuel spill?

C. Helicopter Start-Up Emergency.

The most likely start-up emergencies include failure to untie the main rotor, doors or cowling not secured, or an engine over-temperature condition during start.

Preparedness planning to cover these emergencies should include answers to the following:

- Are Parking Tenders in position during helicopter start up?
- Have Parking Tenders been briefed on start-up emergencies and responses?

D. Approach-Departure or External Load Operations Emergency.

Many helicopter accidents occur during approach to or departure from a remote landing area (helispot or unimproved landing site). Usual causes are obstructions to flight (wire, cable, or snag), an engine or dynamic flight control failure, or inadequate clearances.

Preparedness planning to cover these emergencies should include answers to the following:

- Are extinguishers available at all helispots?
- Is the site accessible (if not immediately adjacent to the landing area)?
- Does the site have interface issues (building, schools, houses, etc.)?
- Is flight following adequate so that aircraft location is always known?
- Have Pilots been briefed on area-wide hazards as identified on the incident or project map?
- Have Pilots been briefed on hazards in the vicinity of each helispot using Form HBM-2, Helispot Information Summary.

E. Other Hazards to Helicopters at Landing Sites.

Other landing area emergencies might involve vehicle or personnel movement when helicopters are operating, as well as other aircraft in the vicinity.

Preparedness planning to cover these emergencies should include answers to the following:

- Have adequate safeguards been provided to control vehicle and personnel movement on the landing area?
- Are there warning signs posted?
- Are Parking Tenders and other deck personnel alert to vehicle and/or personnel movement?
- Are flight routes and hazards posted on the Helibase Facilities, Hazard, and Flight Route Map?

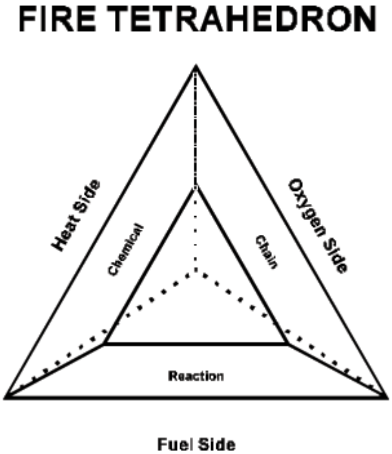
IV. Classes of Fire.

Fire is a result of a chemical chain reaction between fuel, heat and oxygen. This relationship is known as the fire tetrahedron. See Exhibit 12-2.

If one interrupts the chemical chain reaction, or takes away any of the other three elements, the fire is extinguished. This is what a fire extinguisher does.

Fire can develop with any number of different fuels, and extinguishers for one type of fuel are not always effective on other types of fuels. Fire is divided into four classifications depending on the type of fuel burning. Extinguishers are available for each type.

Exhibit 12-2: Fire Tetrahedron



A Class A Fires.

Class A fires involve wood, cloth, paper, rubber, and/or plastics. Water is often used to cool the fuels and extinguish the fire. Extinguishers suitable for Class A fires are identified by a triangle containing the letter “A”. The triangle is colored green. See Chart 12-1.

B. Class B Fires.

Class B fires involve flammable or combustible liquids such as jet fuel, gasoline, oil, hydraulic fluids, solvents or similar materials. These fires require extinguishers like carbon dioxide, foam, dry chemicals, or halon. These extinguishing agents act to deprive the fire of oxygen or interfere with the chemical chain reaction. Extinguishers suitable for Class B fires are identified by a square containing the letter “B”. The square is colored red. See Chart 12-1.

C. Class C Fires.

Class C fires involve energized electrical equipment that may present a shock hazard. These fires require de-energizing the electrical equipment and applying carbon dioxide (CO2) or halon. Extinguishers suitable for “Class C” fires are identified by a circle containing the letter “C”. The circle is colored blue. See Chart 12-1.

D. Class D Fires.

Class D fires involve combustible metals such as magnesium or lithium. These fires require a dry powder, which smothers the fire and doesn’t react with the burning metal.

Extinguishers suitable for Class D fires are identified by a five-point star containing the letter “D”. The star is colored yellow. See Chart 12-1.

CAUTION: A dry chemical extinguisher should not be confused with a dry powder extinguisher. They are not the same.

Chart 12-1: Class of Fires

Class of Fire	Types of Materials	Type of Extinguisher	Symbol
A	Wood, cloth, paper, rubber, and plastics	Water	Green Triangle containing the letter “A”
B	Flammable or combustible liquids such as jet fuel, gasoline, oil, hydraulic fluids, solvents or similar materials	Carbon dioxide, foam, dry chemicals, or halon	Red Square containing the letter “B”
C	Energized electrical equipment that may present a shock hazard	Carbon dioxide (CO2) or halon	Blue Circle containing the letter “C”
D	Combustible metals such as magnesium or lithium	Dry powder	Yellow five-point star containing the letter “D”

V. Extinguishing Agents.

The grouping of fires into classes is important because the agents used to fight one class of fire may not be effective on fires of other classes. Extinguishers designed for one class of fire may be extremely dangerous when used on other classes of fires. For example, a water extinguisher is not recommended for use on Class B or flammable liquid fires, since it may spread the fire.

While certain extinguishers such as multi-purpose dry chemical extinguishers can be used on Class A, B, and C fires, no extinguisher is effective on all four classes of fire.

Portable fire extinguishers come in a variety of weights and sizes. However, the effectiveness of an extinguisher is not solely determined by its weight or size. It is also determined by the training and knowledge of the person using it. The single most critical element in firefighting is response time. This means the person closest to the accident must know what to do, and do it immediately. Portable fire extinguishers are considered the first line of defense when a fire occurs, and are effective firefighting tools if used properly and on the fires for which they have been designed.

Types of extinguishers most commonly used are:

A. Water.

Water is very effective on Class A fires involving ordinary combustible materials. It may be applied from engines, portable hand pumps, or stored pressure extinguishers. Water must not be used on Class C fires as water applied to energized electrical equipment presents a hazard from electric shock.

B. Foam or Aqueous Film Forming Foam (AFFF).

AFFF, commonly referred to as “A-Triple F”, should not be confused with Class A wildland fire foams. AFFF is designed to extinguish Class B flammable liquid fires, but can also be effective on Class A fires. The foam creates a blanket which smothers the fire. An aqueous solution from the foam bubbles creates a vapor barrier over the fuel surface, preventing re-ignition of the fuel. Foam must not be used on Class C fires as foam applied to energized electrical equipment presents a hazard from electric shock.

C. Carbon Dioxide.

Carbon dioxide (C02) is a gas 12 times heavier than air. It is non-poisonous and will not support combustion nor sustain life. Carbon dioxide extinguishers are suitable for Class B and C fires. It is discharged in a gaseous form and is easily affected by drafts or wind. It is non-corrosive, non-damaging, and leaves no residue. The danger from CO_2 is the possibility of losing consciousness or being suffocated in an enclosed space or low-lying place.

D. Dry Chemical.

Dry chemicals consist principally of bicarbonate of soda, potassium bicarbonate or ammonia phosphate and are used to smother the fire. Dry chemical extinguishers are of two basic types. One type is pressurized by dry nitrogen or dry air, and the other type has a cartridge with CO_2 under pressure. When the cartridge of the second type is punctured, CO_2 pressure expels the agent.

Danger from the dry chemical extinguisher lies in discharging it into an occupied crew or passenger compartment, or directing the stream into the escape path of occupants, causing a visual impairment. Dry chemical extinguishers are normally rated for Class B and C fires, but some are rated A, B, and C.

Some dry chemical extinguishers have a tendency to pack solid from their own weight and vibration. They need to be removed periodically and inverted so they may be discharged properly.

E. Halon.

Halon extinguishers are generally rated for Class B and C fires. Some may have a Class A rating as well. Halon, like CO2, is a gas and will be affected by wind. Halon use on fires may produce toxic by-products. Use these extinguishers in well ventilated areas and avoid breathing the gas.

F. Dry Powder.

Two extinguishing agents are listed for use on Class D (combustible metal) fires.

1. G-1 Powder. G-1 Powder is a screened graphitized foundry coke with various phosphates added. The material acts as a heat conductor to lower the temperature of the burning metal. It forms a coating to smother the fire by excluding air, and may be used in magnesium and magnesium alloy fires.
2. Met-L-X Powder. Met-L-X Powder has a sodium chloride base with additives. An additive fuses at high temperatures to aid in forming an air-tight coating. It may be used on magnesium, sodium, potassium, and sodium-potassium alloy fires.

VI. Requirements.

A. Extinguishing Agent for Helicopter Landing Areas.

The required extinguisher for helicopter landing areas is a 20-pound, dry chemical, 40 B:C rated extinguisher.

This size extinguisher is lightweight, portable, self-contained, and highly effective on Class B (flammable liquid) fires. However, its effectiveness will always depend on the training and knowledge of the person using it.

B. Personal Protective Equipment.

Except in rare instances when the Pilot has recognized and/or declared an in-flight emergency, ground support personnel will have no advanced notice of a helicopter emergency. Therefore, personal protective equipment shall be worn at all times by helibase support personnel so as not to delay an immediate response to an accident.

> CAUTION: Clothing, either regular or fire resistant, affords little thermal protection from the radiated heat of aviation fuel fires. Extreme caution must be used by personnel approaching a burning aircraft.

Additionally, smoke from aircraft fires may contain toxic gases and/or minute particulates of combustion. Exposure without a self-contained breathing apparatus must be avoided.

Given the limitations and hazards outlined above, personnel must be trained to respond appropriately.

C. Emergency Tools and Equipment.

Emergency tools and equipment should be prominently positioned adjacent to the landing area(s). All helibase ground support and flight crews should be made aware of these locations. Crash rescue equipment is required at helibases and at helispots which will see continued use over the course of an incident or project. Chapter 9 outlines the minimum requirements for fire extinguishers, evacuation kits, and crash rescue kits at helicopter landing areas.

1. Fire Extinguisher. One (1) fire extinguisher per landing pad, located immediately adjacent to the safety circle for that pad.
2. Crash rescue Kit. One (1) crash rescue kit or equivalent per every five (5) helicopters using the landing area. The kit contains crash axes, hacksaw with blade, bolt cutter, seat belt cutter, and door opener tool. It is used to gain access to the crew and passenger compartments if normal exits are rendered unusable in the accident.
3. Evacuation Kit. One (1) evacuation kit per every five (5) helicopters using the landing area. The kit contains a first aid kit, splints, blanket, ground marker, head lamp, and stretcher to provide for evacuation of injured personnel from the accident scene.

   Check kits upon receipt to ensure content, condition, and suitability of tools and equipment.

D. Additional Crash Rescue Resources at Helibases.

The basic extinguisher requirement may be supplemented by foam-equipped engines, a plumbed system, or other methods. Emergency equipment should be placed to allow immediate access, but must not hinder normal flight or ground operations.

Trained personnel and equipment are often available from fire departments and military bases. Air operations staff must weigh the cost of such resources versus the probability of an aircraft emergency occurring. Another factor to consider is the proximity of the helibase to urban development. In this case, ordering fully-equipped crash rescue services may be prudent.

> CAUTION: It is not recommended that agency personnel in a foam-equipped engine be assigned helibase crash rescue duties unless they have received advanced aircraft firefighting training and are equipped (turnouts and SCBAs) to respond safely.

VII. Strategy and Tactics.

A. Strategy.

The primary objective of helicopter or helibase ground support personnel participating in crash rescue activities is to prevent loss of life or property. If needed, firefighting action should provide maximum fuselage integrity and an escape path for occupants. To the extent possible, crash rescue personnel should assist in evacuation of the helicopter using normal or emergency means of egress.

The most important factors involved in effective rescue and firefighting efforts in a survivable helicopter accident are:

- Training received.
- The response time of crash rescue personnel and equipment.
- The effectiveness of crash rescue and extrication equipment.

All actions taken must be aimed at providing care to survivors as quickly as possible.

B. Tactics.

One of the most important skills in crash rescue is the ability to improvise. Every emergency response is unique, and accident sequences often occur in an unforeseen manner. Being able to adjust the response to fit the situation is an absolute necessity.

The likelihood of the need to improvise is never a valid reason for not learning and drilling in the fundamentals. Without basic skills, the individual or crash rescue team has no foundation upon which to improvise. Without experience in using those skills, they will lack the judgment necessary for safe, effective crash rescue.

Before effective action may be taken, personnel must be familiar with the various characteristics of the helicopter(s) involved in the accident.

1. Helicopter Makes and Models. Crash rescue diagrams of many frequently used helicopters are provided in Appendix M of this guide. These diagrams provide general features of a model of helicopter. Some of the diagrams have emergency procedures information, including the location of fuel and battery shutoffs, attached.
2. Briefings. Since the diagrams provide only information generic to a model, they must be supplemented by on-site review or briefings which address the specific features of each helicopter assigned. Briefing material should include, but is not limited to:
   - Door operation
   - Location and operation of emergency exits

- Location and operation of the Emergency Locator Transmitter (ELT)
- Location of the first aid kit and fire extinguisher(s)
- Operation of crew/passenger restraint devices
- Emergency shut-down procedures for the battery, fuel, and other aircraft systems.

All of the above items are part of the Aircraft Safety Briefing required to be given to all passengers. Prior to the commencement of operations, it is particularly important that all crash rescue personnel be given a more in-depth briefing on these items.

3. Factors Influencing Tactics. Tactics employed at the accident scene are dependent on many factors, including but not limited to:
    - Terrain and obstacles
    - Wind direction
    - Type of helicopter(s) involved
    - Crew stations and passenger locations within the helicopter
    - If a fire results, its location and the degree of fire involvement
    - Other mission-specific equipment attached (for example, helitorch, plastic sphere dispenser, external cargo, hazardous materials, etc.)
4. Sequence of Actions. Recognizing that accidents are all different, there is a general sequence of actions that can usually be followed.
    a. Approach. After an alarm has been received, or a crash has occurred, the most direct route offering the fewest obstacles should be used. The normal precautions on approaching helicopters should be taken. These include, but are not limited to:
        - Approach from the front or side
        - Approach from ground that is lower than that on which the helicopter is resting
        - Carry all equipment horizontally at waist level, not over the shoulder
        - Do not approach until the rotors and other moving components are at rest

        > CAUTION: It is not unusual during a crash for the rotor blades to strike obstacles or the ground, with debris thrown a considerable distance from the accident site. Evaluate the situation before approaching. It is usually wise to take the nearest available cover, or lie prone, as an accident is occurring.

        The first person responding (“first responder”) will need to evaluate the best approach to the helicopter if the rotor blades or other components are still moving. The first responder should consider:

        - Will moving components soon come to rest?

- Is the Pilot or other occupant attempting to shut the helicopter down?
- Is it a survivable accident?
- Is a fire, or the potential for fire, present?
- Can the helicopter be approached safely?

If the decision is made that the first responder will shut down the aircraft, other responders should stand by until that task is accomplished. Do not expose more personnel to a hazard than absolutely necessary.

If a fire is present, the best approach is usually from upwind so that the responder is not hindered by smoke or heat. Extinguishing agents are also more effective when applied from upwind. However, all responder(s) need to evaluate conditions before approaching.

When approaching the helicopter with extinguishers, engines, or other apparatus, do not block the escape path of the occupants. Do not direct streams of extinguishing agents at them which could cause them to become disoriented.

> CAUTION: Helicopter structures damaged by fire or impact forces are often very unstable and are subject to collapse or rollover. If these conditions are suspected to exist, precautions in the form of blocking or shoring should begin as soon as possible to ensure the safety of personnel working on evacuation.

b. Entry. When the helicopter can be safely approached and entered, the first responder should assist the survivors in leaving the aircraft. Depending upon make and model, an entry/exit door or doors may be found on each side of the helicopter.

Smaller helicopters have doors that usually open outward and are hinged on the forward side. The inside is fastened by a latch that is usually operated by pulling the latch mechanism.

Larger helicopters usually have front flight crew doors similar to those on smaller helicopters. However, the doors on the passenger compartment(s) are usually the sliding type. Most often they slide from front to rear.

On most helicopters, an emergency release mechanism is installed at the hinge side and is operated by pulling on the jettison handle.

Escape hatches or escape panels are provided on some helicopters and are made of either plexiglass or metal. The hatches should have an external release handle, with the location and operating procedures marked on the adjacent surface of the fuselage.

If access is hindered for whatever reason, emergency cut-in using a crash axe should be in the area of the doors, windows, or windscreen. Avoid structural areas of the fuselage where use of the axe or other tools might rupture fuel, electrical, or oxygen lines, causing an explosion and/or fire.

> CAUTION: Extreme care should be used when cutting into an aircraft. Occupants might be injured by tools penetrating too far into the aircraft. Also be aware that cutting actions may create sparks which might ignite fuel vapors. Evaluate the situation carefully.

c. Rescue of Occupants. After entrance to the flight and/or passenger compartments is achieved, crash rescue personnel should perform the following, in order:

(i) Locate and then determine the condition of the occupants.

(ii) Evacuate uninjured occupants first, if possible.

(iii) Evacuate injured occupants.

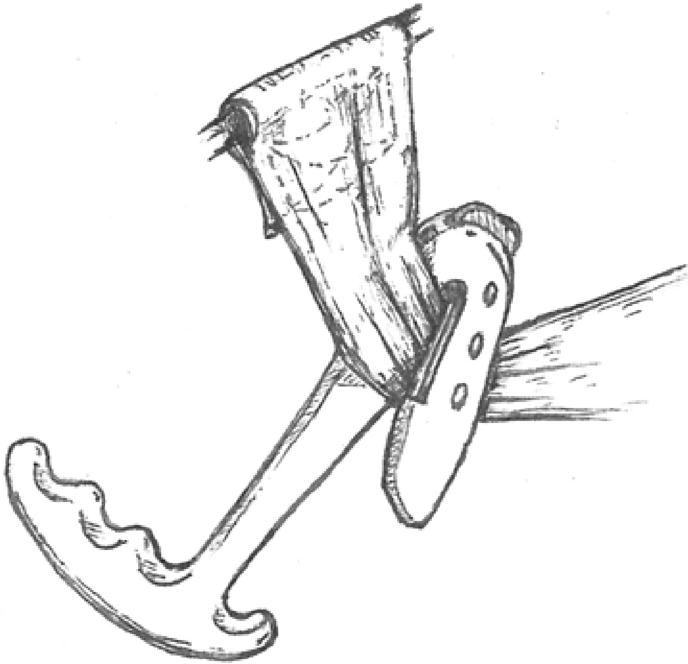
> CAUTION: Extreme care must be taken when moving injured personnel to prevent aggravation of existing injuries or causing additional ones. Due to the high vertical deceleration forces experienced in a helicopter hard landing or accident, assume lower back injuries are present. Assistance from trained medical personnel should be obtained before moving injured personnel.

If immediate evacuation is not possible due to wreckage configuration or occupants being trapped within the compartment, and fire is present, responders should attempt to keep the fire away from the area where personnel are trapped.

All helicopter seats have seat belts that include shoulder harnesses. Both belts and harnesses are constructed of very strong material and are difficult to cut. Crash rescue personnel must be knowledgeable of release procedures.

Release configurations vary among make and model of helicopter, and may even vary among seats in the same helicopter. If the belt or harness cannot be released normally, use the seat belt cutter included in the crash rescue kit. See Exhibit 12-3.

Exhibit 12-3: Seat Belt Cutter



d. Fatalities. In an emergency triage situation, common sense dictates that personnel who have been fatally injured receive lower priority for evacuation than those still living.

Responders should not attempt to remove a fatally injured individual from an aircraft if they will be at risk from existing fire or other hazards. In an accident involving fatalities, remember:

- Contact the local Coroner to make the legal determination of death.
- Do not release the name(s) of the victims. The local Public Information Officer (PIO) should be informed as soon as possible to deal with media inquiries.

Fatalities are also discussed at the end of this chapter.

e. Evacuation. After all occupants have been accounted for, medical injuries should be treated to the extent possible and only within the skill level of those present. Injured personnel should be prepared for transport to the appropriate medical facility.

While crash rescue personnel are performing the evacuation, it is critical that the helibase Aircraft Base Radio Operator (ABRO) or other individual assigned be making the contacts identified in the Medical Unit Plan and/or in Form HJA-4, Helibase Emergency Rescue Plan. Note that for project operations, initial contact is usually made with the local dispatch office, who will implement the unit accident preparedness plan.

If the accident is not at a location with known conditions, the ABRO should use Form HJA-4B, Emergency Medical Services - Helicopter Ambulance Request Information, to obtain and relay information. See Appendix B for further information and discussion. In order to avoid delays in what may be a life-threatening situation, it is essential that the ABRO obtain as much information on this form as possible.

The need for emergency evacuation of injured personnel should be considered before operations begin. It is impossible to detail all possible evacuation situations that could exist. Nonetheless, these situations can be planned for, to some extent.

- Evaluate all assigned helicopters for evacuation capabilities and designate a primary and, if possible, backup medevac ship.
- Brief all Pilots, crews, and helibase personnel on roles, responsibilities, and procedures.
- Coordinate closely with the local dispatch or other responsible office both in preparedness planning and during any evacuation.

Inclement conditions (weather, nighttime) may affect aerial medevacs. Remember the Pilot has the final authority on performing the mission.

VIII. Preservation of the Accident Scene.

Following extrication and evacuation of the occupants, preservation of the accident scene and documentation of actions taken is vitally important to the accident investigation that will follow.

The accident scene and perimeter should be immediately roped or flagged off. Security should be provided to prevent entry by unauthorized personnel. Any person not actively engaged in the rescue or firefighting operation should be denied entry to the area. The Incident Command Staff or the Project Aviation Manager should be briefed away from the immediate accident scene.

The Helibase Manager or other official in charge should ensure that crash rescue and other helibase personnel immediately document the following:

- Condition and position of the aircraft prior to any significant cutting or alteration, including its initial position before the accident, position when it came to rest, and position after evacuation and extrication was performed. Use written statements, sketches, and photos or video. Personnel should document sounds heard, their actions, actions of others, etc.

IMPORTANT NOTE: It is essential to an investigation team that personnel involved in an accident, or accident response, not coordinate their statements. Each individual should independently document their experience.

- Preserve and secure all helibase documentation for that operational period, including Helibase Mission Request Logs, Flight Following Logs, load calculations, manifests, Unit Logs, Helibase Organization Chart, Daily Helicopter Operations Briefing/Debriefing Checklist, and other relevant material.
- Removal of the bodies of fatally injured occupants from the wreckage should be accomplished only by, or under the direction of, the responsible medical examiner (coroner). Premature removal can interfere with identification and/or destroy required pathological evidence. If body removal is necessary to prevent further incineration, the original location of the body and the body itself should be tagged or otherwise identified, and the facts reported to the investigation team.

BE AWARE AND BE PREPARED. SOMEONE'S LIFE MAY DEPEND ON YOUR ACTIONS.

CHAPTER 13: FUELING OPERATIONS.

I. Introduction.

Fueling operations, whether conducted by government or vendor personnel, could potentially result in environmental damages or catastrophic accidents.

It is the responsibility of all personnel, both vendor and government, to ensure that fueling operations are conducted in accordance with procurement document specifications, agency fueling directives, and all other applicable local, state, and federal regulations. Special attention must be paid to federal, state, and local hazardous materials regulations and to agency-specific fuel spill avoidance requirements.

Appendix I, Remote Fuel Site Reminders List, is a job aid that can be used by Helibase Managers and Fueling Specialists.

II. Responsibilities.

A. Management.

Agency heads are responsible for the management and effective implementation of a Fuel Quality Control Program within their respective agency. Supervisors and managers at all levels are responsible for the safe delivery of fuel during aviation operations under their jurisdiction or control. Within this responsibility is the practical requirement to provide safe working conditions, prevention of injury to persons, and the protection of property.

B. Employees.

To enhance safety, employees of participating agencies who become aware of any fuel-related mishaps (for example, fuel spills, fires, damage to aircraft or fueling facilities or vehicles, incorrect fueling of aircraft, incorrect fuel put in an aircraft, etc.) should report such occurrences using the agency incident/hazard report. In situations where imminent danger exists, the operation should be suspended immediately.

C. Fuel Vendors.

Vendors conducting business for the transportation, storage or dispensing of aviation fuels, including into-aircraft operations, shall adhere to the procurement document provisions and specifications. For the most part, such operations shall be in accordance with the standards and procedures specified in applicable American National Standards Institute (ANSI) or National Fire Protection Association (NFPA) publications.

D. Pilots.

The Pilot is personally responsible for ensuring that the proper type and grade of clean, dry fuel is pumped into the aircraft.

III. Fuel and Oil Pollution Prevention.

Agencies must be informed of the Environmental Protection Agency (EPA) regulations found in 40 CFR 112. Regardless of the size or location of an operation, it is necessary that an assessment be made to determine whether or not provisions of the regulations are applicable.

The basic criterion is if it can be reasonably expected that a discharge of fuel or oil will enter navigable waters, a facility is subject to the regulations. This requires the preparation and implementation of a Spill Prevention Control and Countermeasure (SPCC) Plan. Exceptions to this requirement are:

- Above-ground facilities having a total storage capacity of 1,320 gallons or less of fuel, provided no single container has a capacity in excess of 660 gallons.
- Underground facilities having a total storage capacity of less than 42,000 gallons.

Agencies are encouraged to contact their local EPA office for detailed information concerning these regulations.

A. Fuel Spill Prevention Guidelines and Requirements in Environmentally Sensitive Areas.

Check with the local aviation manager for additional fuel spill prevention guidelines and requirements in place for various geographic locations due to local or national environmental concerns and constraints.

Prior to the start of a project or upon arrival at an incident, the air operations staff should consult with the local Resource Advisor regarding any restrictions that may apply.

Restrictions may include, but are not limited to:

- Establishing fueling sites at predetermined locations, occasionally at some distance from the helibase. Since this may have a significant impact on operations, additional planning and helicopters may be required.
- Prohibitions on fuel vehicles traveling on certain roads (usually adjacent to streams and rivers).
- Requirements for containment dikes around fueling pads.
- Proper containment and disposal of fuel samples.

IV. Types of Fuel.

There are currently two categories of aviation fuel in use. These are aviation gasoline, commonly called AVGAS, and turbine or jet fuel.

A. Aviation Gasoline (AVGAS).

Aviation gasolines are used in reciprocating aircraft engines. There are currently three grades of aviation gasoline in use:

- 80/87
- 100 Low Lead (100 LL)
- 100/130

B. Turbine (Jet) Fuel.

Aviation turbine fuels are used to power turbofan, turbojet, and turboprop aircraft engines. There are two types of turbine fuel in use:

- Kerosene based (Jet A, Jet A-50, JP-8, and Jet A-1)
- Blends of gasoline and kerosene (Jet B and JP-4)

Most commercial operators use Jet A or Jet A-50. The military normally uses JP-4 and JP-8. The specifications for JP-8 are similar to Jet A except that JP-8 has required additives for anti-icing, anti-corrosion, and anti-static.

V. Requirements for and Methods of Identifying Types of Fuel.

A. By Color.

If sample is not the right color, suspend the operation immediately. The following colors are indicative of the type of fuel:

Type	Aviation Gasoline			Turbine Fuel
Grade	80/87	100 Octane Low Lead	100/130	(Jet A, Jet A-50, Jet A-1, Jet B, JP-4, and JP-8)
Color	Red	Blue	Green	Clear or straw-colored

WARNING: The EPA and Internal Revenue Service (IRS) require that certain types of high and low sulfur diesel be colored blue and red. Aviation grade 100 LL and 80/87 fuels are also colored blue and red, respectively. The potential exists for a supplier to furnish diesel fuel instead of 100 LL. The FAA has issued a Notice to Airmen (NOTAM) and a special alert bulletin to pilots warning of the color conflict.

B. By Markings of Fuel Type and Grade.

A marking and coding system has been adopted to identify the various fuel handling facilities, equipment, containers, inlet-outlet joints, and aircraft fuel filler openings according to the type and grade of fuel they contain.

1. Fuel Servicing Vehicles. Each aircraft fuel servicing vehicle shall be conspicuously and legibly marked with an identification decal to indicate the product contained in the vehicle. The markings shall be on each side and the rear of the vehicle in letters at least 3” high. Vehicles must be marked as follows:

   - JET A - Combustible
   - JET B - Flammable
   - AVGAS - Flammable

   Decal color markings are as follows:

Type	Aviation Gasoline			Turbine Fuel
Grade	80/87	100 Octane Low Lead	100/130	(Jet A, Jet A-50, Jet A-1, Jet B, JP-4, and JP-8)
Marking	White Letters On A Red Background	White Letters On A Blue Background	White Letters On A Green Background	White Letters On A Black Back-ground

2. Valves and Piping at Permanent Storage Facilities. Valves, loading and unloading connections, switches, and other control equipment shall be color-coded to identify the grade and type of fuel they control. The fuel in piping is identified by name and by painted color bands, or a decal placed around the pipe at intervals along its length.
3. Hose Lines. Hose lines shall be marked by decals or labeled adjacent to the nozzle to indicate the type of fuel dispensed. Reference the API Bulletin footnoted below.
4. Portable Storage Facilities - Containers.
   a. Bulk Collapsible Tanks (Bladders and Rollagons). Large fixed collapsible tanking facilities, as well as their accessory fueling lines and equipment, shall be marked or decal attached in accordance with the requirements for vehicles in Section V.B.1.
   b. 250 and 500 Gallon Collapsible Rollagons. Each end of a rollagon shall be marked in letters at least 4” high with the type and/or grade of fuel in the container.
   c. 55-Gallon Barrels. The top head or sides of a 55-gallon barrel shall be marked in letters no smaller than 3/4” with the type and/or grade of fuel, filling date, vendor, and any other pertinent information.

NOTE: Agency authorization is required for use of 55-gallon fuel barrels.

d. 5-Gallon and Smaller Containers. All containers shall be marked with the type and/or grade of fuel contained. In many cases the 5-gallon containers are marked by the fuel manufacturer.

CAUTION: Portable plastic containers should be used only when the fuel grade is JET A and no alternative exists. If using portable plastic containers, an approved funnel capable of separating water and contaminates, along with bonding capabilities, is required. Portable plastic containers are not authorized for JET B and AVGAS in aircraft refueling operations.

5. Aircraft. Various FARs require that aircraft fuel filler openings be marked with the word “FUEL,” the minimum fuel grade or designation for the engine(s), and the tank capacity. Markings should be kept clean and legible.

VI. Contamination Testing.

The “Clear and Bright” (Dry) Sampling Test should be used by either the vendor or, if government-operated fueling operation, by trained government personnel. This test involves the following steps, in order:

- Collect fuel sample in a clean, clear 1-quart glass jar. Samples are collected from tank and nozzle.
- Check color against the background of the sky. If water is present, free water (water not in solution) will separate and lay in the bottom of the jar.
- Swirl the contents of the jar. Any free water and/or water in solution will cause the color to become cloudy.

WARNING: If fuel is found or suspected to be contaminated, suspend all operations immediately (including those of other aircraft that may have been fueled from the same source) and contact agency aviation safety representatives.

- If water is detected in the tank sample, sump and continue to test until no more water is detected in sample jar. Do not allow helicopter fueling until the sample is free of visible contamination.
- If water is detected in the nozzle sample, suspend the operation immediately.
- Particles in the sample can also be visually identified.
- If particles appear in the tank sample, sump tank until sample is clean.
- Do not use fuel if any nozzle sample indicates:
- Wrong color, not clear or bright.
- Visible particulates are present.
- Visible water is present.

VII. Fueling Hazards.

When personnel fuel a helicopter, they transfer extremely combustible liquids from a storage or transportation vessel to the fuel tank(s) of a helicopter. Such operations are hazardous if the proper procedures are not followed.

Personnel should follow servicing instructions and use the proper equipment in accordance with established operating procedures.

While fueling aircraft is not unusually hazardous under normal conditions, certain other conditions may increase the hazard. Fueling personnel should be aware of the potential problems caused by fuel vapors in the presence of ignition sources such as static electricity, certain weather conditions, electromagnetic energy, and open flames.

They should also be aware of other conditions that introduce additional sources of ignition and/or increase the likelihood of fuel or fuel vapors escaping.

A. Fuel Vapors.

Fuel vapors create potentially hazardous situations, so personnel must be sure to follow prescribed procedures.

When fuel is transferred into an aircraft tank, the incoming fuel forces fuel vapors out through tank vents, with an explosive vapor-air mixture formed in the vicinity of the operation. At some point, the escaping fuel vapors will be within explosive limits, depending upon atmospheric conditions and the type of fuel involved.

> WARNING: Because AVGAS has a flash point of about -50° F, sufficient vapors are liberated to produce a flammable vapor-air mixture under almost all conceivable atmospheric conditions. All that is needed to cause a fire or explosion is a source of ignition.

Additionally, because the rate of vapor generation increases as the temperature of the fuel increases, the risk of fire or explosion increases when atmospheric temperatures rise.

Because fuel vapors are heavier than air, they will settle to the ground and accumulate in ditches, pits, or other depressions and may travel great distances before coming into contact with an ignition source.

B. Ignition Sources.

In any area in which aircraft are parked or operating, there are numerous ignition sources that may ignite fuel vapors. These sources include static electricity, such as that caused by low-conductivity liquids, refueling vehicles, and clothing; adverse weather conditions (lightning); electromagnetic energy (radar); and open flames.

1. Static Electricity. Static electricity is more difficult to control than any other ignition source. The mechanism responsible for this phenomenon is complex, and there are many variables that may increase and decrease the amount of energy generated. Static charges may exceed 50,000 volts and may produce sufficient energy to cause an explosion above the surface of liquid fuel.

   When low-conductivity liquids, such as hydrocarbon fuels, flow through a piping system, they tend to become electrostatically charged. Refueling vehicles have developed measurable electrostatic charges exceeding 50,000 volts during filling operations. This high voltage is partially a result of the insulating effect of the vehicle's rubber tires. To eliminate this insulating effect, the refueling vehicle must be properly bonded to the helicopter during fueling operations.

   During windy conditions, the movement of dust particles and air currents may cause parked helicopters and refueling vehicles to develop larger-than-usual charges of static electricity.

   > CAUTION: Personnel should exercise caution when there are thunderstorms or electrical storms in the vicinity. The energy generated by these natural phenomena may ignite flammable fuel vapors.

   When the atmosphere is unusually dry, certain fabrics are notorious for accumulating a static charge. Therefore, personnel who operate refueling vehicles should avoid wearing materials made of polyester, nylon, rayon, silk, or wool when working in cold, windy weather.

2. Electromagnetic Energy. Transferring fuels is hazardous within 300 feet of the source of electromagnetic energy such as that created when high-powered radar operates. However, portable and mobile radio equipment may be used safely beyond 10 feet from fuel filler openings and/or vents.

3. Open Flames. Open flames should be strictly controlled or prohibited in aviation operations areas or within 50 feet of any aircraft fueling operation. Open-flame devices include:

   - Lighted smoking materials of any type.

   > NOTE: "No Smoking" signs should be posted at all entrances to fueling areas. At remote sites (off-airport), pennant-type flagging or other barriers should be used when a single-use fueling area is established.

   - Exposed-flame heaters whether liquid, solid, or gas-fired devices, including portable and wheeled gasoline or kerosene heaters and open-element electric heaters.
   - Welding and cutting torches and blowtorches.
   - Grinding equipment, either portable or stationary.
   - Flare pots or other open-flame lights.

4. Other Conditions. There are other normal and accepted fueling operations that are hazardous and may require additional safety precautions. Some of these operations are:

   - Defueling an aircraft that requires fuel to be drained into open drums or containers.
   - Defueling an aircraft that requires an auxiliary power unit or the aircraft engine(s) to be operating during the defueling.
   - Servicing an aircraft fuel system that has undergone maintenance but has not been functionally tested before being serviced.
   - Fueling an aircraft or using systems with which servicing personnel are not thoroughly familiar.
   - Performing other potentially hazardous operations, such as maintenance, power plant operation, and energizing the aircraft electrical system, while the aircraft is being fueled/defueled.

VIII. Safety Precautions.

Aircraft batteries, battery chargers, or other electrical equipment should not be connected, disconnected, or operated during fuel servicing. Radios and electronic flash equipment should not be operated with 10 feet of fueling equipment or of the fill or vent points of the aircraft.

A. Grounding Requirements.

The National Fire Protection Association (NFPA) no longer recommends grounding aircraft during refueling operations. Due to the particular difficulty involved in grounding helicopters at off-airport sites, the recommendation of NFPA (not to require grounding) should be followed by participating agencies.

Grounding may be a required procedure at military or civilian airports or by military helicopter crews. Therefore, grounding should be accomplished when required by local regulation.

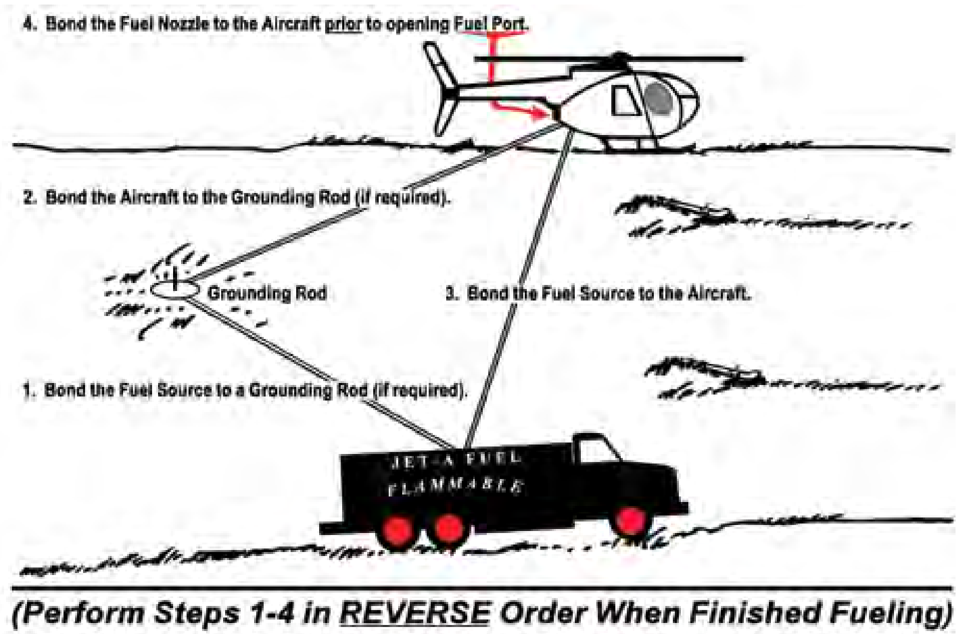
B. Bonding Requirements and Procedures.

Bonding involves connecting two or more metallic objects together by means of a conductor that equalizes the electrostatic potential between the objects. Although some fuels being used in aircraft have additives that inhibit static electricity generation, bonding aircraft to the fuel nozzle is a required safe practice. See Figure 13-1.

1. Pre-Bonding Inspection. Check condition of the bonding cable and plug. Procurement document language will usually state required bonding equipment condition.

2. Connecting the Bond. Refer to Exhibit 13-1. Bonding must be performed as follows, in order (omit grounding steps if not required):
   - Bond the fuel source to a grounding rod (if available and required).
   - Bond the helicopter to the grounding rod (if available and required).
   - Bond the fuel source to the helicopter.
   - Bond the fuel nozzle to the helicopter prior to opening the fuel port.
3. Disconnecting the Bond. Disconnect the bond in reverse order (omit grounding steps if not required):
   - Disconnect the fuel nozzle bond from the helicopter after closing the fuel port.
   - Disconnect the fuel source bond from the helicopter.
   - Disconnect the helicopter from the grounding rod (if used).
   - Disconnect the fuel source from the grounding rod (if used).

Exhibit 13-1: Correct Bonding Procedure



C. Rapid Refueling.

Hot refueling of helicopters is permitted if requested by the Government. Equipment used for hot refueling operations shall meet all NFPA 407 requirements. Hot refueling operations shall meet provisions contained in NFPA 407.

Review the procurement document for additional requirements prior to any hot refueling operation.

Government personnel shall not refuel contract aircraft unless the pilot requests assistance due to an emergency situation, or when the Government provides the fuel servicing system and dispensing personnel.

IX. Vendor Fueling Operations.

A. Vendor Responsibility.

Vendors are responsible for maintaining equipment and conducting refueling operations in accordance with the procurement document and, when appropriate and when not in conflict with the procurement document, in accordance with the safety procedures stated in this guide.

B. Government Responsibility.

The government representative (for example, Helicopter Manager or Helibase Manager) is responsible for ensuring that:

- Vendor equipment meets specifications and is correctly maintained in accordance with the procurement document; and
- Fueling operations are conducted in accordance with the procurement document and, when appropriate and when not in conflict with the procurement document, in accordance with the safety procedures stated in this guide.

C. Government Participation.

The government shall not participate in vendor fueling operations. Personnel shall maintain a distance of at least 50 feet from the fueling site until such time as the operation is completed. A “fire guard” (for example, a Parking Tender with fire extinguisher) may be posted at the edge of this 50-foot safety circle.

D. Vendor Service Truck Requirements and Specifications.

It is essential that the government representative ensures that all fueling operations involving a service truck are conducted in accordance with the procurement document. The following is provided as a guide only. For specific requirements, each individual procurement document must be consulted. Procurement documents usually contain the following requirements.

- An approved service truck is provided with each helicopter.
- The service truck is suitable for and capable of handling the terrain encountered (e.g., mountainous roads).
- The service truck meets the licensing criteria of each individual state in which they travel. This requirement can result in delays in arrival of the service truck if not anticipated in advance.
- For fire, the service truck tank capacity is usually required to be able to sustain 8 hours of flight (14 hours when a two or more Pilot crew is required). For projects, this requirement may be adjusted according to local need.
- The service truck is properly maintained, clean and reliable. Tanks, plumbing, filters, and other required equipment should be free of rust, scale, dirt, and other contaminants. A trailer used for storage and transport of fuel is usually required to have an effective wheel braking system.
- Spare filters, seals, and other components of the service truck filtering system are stored in a clean, dry area. (A minimum of one set is usually required.)
- All tanks are securely fastened to the truck bed. Tanks shall have a sump or sediment settling area to allow water and particulate accumulation and subsequent removal.
- A 10-gallon-per-minute filter and pump is usually the minimum size acceptable. Filter and pump system sizes should be compatible with the helicopter being serviced.
- The filter manufacturer's Operating, Installation and Service Manual is available with the service truck.
- Gasoline engine driven pumps shall be UL listed for flammable liquid transfer. Physical indicators of UL listed pumps are shielded ignition systems and spark arrestors.
- Tanks erected for above-ground storage and tanks mounted on trucks are equipped with a sump drain valve at the lowest point.
- Only hoses meeting procurement document specifications shall be used for dispensing aviation fuel. Hoses should be kept in good repair.
- The fuel nozzle should include a 100-micron or finer screen, a dust protection device and a bonding clip or plug. Except for Wiggin closed-circuit nozzles, no hold-open devices are permitted.

- An accurate fuel metering device for registering quantities in U.S. gallons of fuel pumped is provided. The meter shall be positioned in full view of the fuel handler while fueling the helicopter.
- The service truck has bonding cables, and, when required, grounding cables.
- Fire extinguisher is mounted in a manner to make it readily available at all times.
- Fire extinguishers should be provided as specified in the procurement document and in accordance with NFPA 10, Standards for Portable Fire Extinguishers.
- Each fuel servicing vehicle should have “NO SMOKING” signs with 3-inch minimum letters visible from both sides and rear of truck.
- Each vehicle be conspicuously and legibly placarded and marked according to the requirements in Section V.B to indicate the nature of the fuel.
- The first and third stage elements of a three-stage system and the elements of a single-stage system should be new and installed by the contract start or during the annual inspection; the separator element (teflon screen) of the three-stage system should be inspected and tested as prescribed by the manufacturer during the inspection; and the filter assembly must be placarded with that data.
- The bottom of the filter assembly should be mounted to allow room for at least a quart size jar to be inserted under the drain for taking fuel samples. Piping for draining and pressure flushing of the unit must be clear of truck wheels and exhaust systems. Water sight gauge must be visible in filter vessels using them.
- Depending on whether it is a single or three-stage (coalescer, water separator, and monitor) system, specific pumps and monitor systems are usually specified. Filters must meet specifications of the procurement document.

E. Fuel Servicing Vehicle Driver Qualifications:

Fuel servicing vehicle drivers shall comply with Department of Transportation Safety Regulation Part 390-399, and any duty limitations imposed by the helicopter procurement document. Refer to the appropriate procurement document for specific requirements.

X. Government Fueling Operations.

There are situations, especially in Alaska, where the government is responsible for supplying fuel and a government-operated fueling operation must be set up to accommodate refueling needs. There may be other situations where the government, though not responsible for supplying fuel, must do so. An example would be an incident so remote, or where helibases have no road access, that the government is supplying fuel via aerial delivery.

A. General Guidance and Requirements.

- Prior to the start of operations, the manager of the refueling site (for example, Fueling Specialist) may use the Remote Fuel Site Reminders List in Appendix I to ensure that operations are set up and conducted correctly. Parts of the Reminders List may also be used by Helibase Managers to correctly locate fueling pads and to monitor vendor refueling operations.
- Minimizing ground time of both the helicopter and of the service truck in close proximity to other helicopters in the refueling area or on the helibase is important to minimize exposure and risk.
- Refer to the Aviation Fuel Handling Handbook for additional information.

B. Personnel Requirements at a Government-Operated Fueling Site.

The following personnel are required on a government-operated fueling site:

- Two people are required to conduct the actual refueling of the aircraft (one may be the Fueling Specialist). One person operates the fuel nozzle; the other is required to be near the emergency fuel shutoff valve.
- Depending on the size of the operation, the fueling operation may also require an Aircraft Base Radio Operator and a Parking Tender.

C. Personal Protective Equipment.

Government fuelers shall wear protective clothing as required in Chapter 9. Vendor fuelers shall wear protective clothing as required in the procurement document.

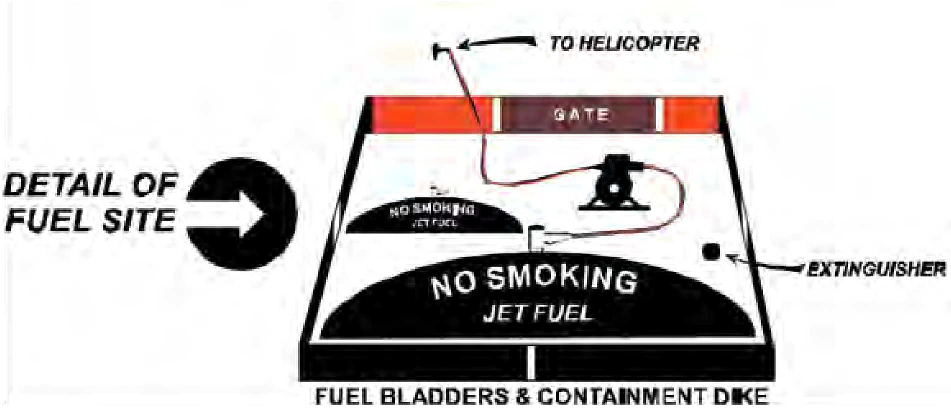
D. Fueling Site Layout.

Fueling sites should be laid out according to the following general guidelines (see *Aviation Fuel Handling Handbook* for additional information):

- The fueling site should be separate from the main area of helicopter operations.
- There should be a minimum of 200 feet pad-to-pad separation between Type 1 helicopters.
- There should be a minimum of 125 feet pad-to-pad separation between Type 2 helicopters.
- There should be a minimum of 90 feet pad-to-pad separation between Type 3 helicopters.
- The fueling equipment at a fixed fueling site (pump, fuel source) should be at least 25 feet outside the rotor disk of the nearest helicopter.

- Wind direction must be considered when setting up refueling points. Landing and takeoff paths must be selected to provide a direct or quartering head wind.
- Fueling activities generate a considerable amount of vapor. Because the vapor is an explosive hazard, the fueling activity should be situated to allow vapors to be dispersed by the prevailing wind.

Exhibit 13-2: Government Fueling Site Layout



E. Equipment Required.

Equipment at the typical fueling site consists of the following:

- A fuel source, which may consist of 55-gallon drum(s), 500-gallon collapsible fuel bladders, permanent or temporary tanks, or a fuel tanker.
- Pump assembly.
- Filter and separator unit. The filter and the separator must be compatible with the pump assembly.
- Hoses, fittings, valves and nozzles. Enough equipment must be available to support the refueling setup that is planned; for example a one-point, two-point, three-point or four point set-up.
- Support equipment. This equipment will include items such as fire extinguishers, grounding rods, waste pans, five gallon containers of water, and absorbent material.
- Fuel sampling kit.
- Fire extinguishers should be located at each refueling nozzle and at the pump and filter assembly.

- A waste fuel pan should be located at each refueling point to wash dirt off the nozzles. The waste fuel pan or barrel is required to limit fuel spillage. Fuel spills should be handled according to the procedures outlined later in this chapter.

F. Equipment Setup.

1. Distances.

   - As stated above, the fueling equipment (pump, fuel source) at a fixed fueling site should be at least 25 feet outside the rotor disk of the nearest helicopter.

   - The fuel source should be downwind of the aircraft exhaust to reduce the fire hazard.

2. Pump Assembly

   - The pump assembly and filter separator must be properly grounded and checked for leaks before operation.

   - Fittings should be properly sealed and free of cracks.

   - Sandbags should be used to elevate the fittings to facilitate pre-operational checks and detection of fuel leaks.

   - Hose clamps should be checked for proper fit.

   - All shutoff valves should be serviceable and properly in place.

G. Equipment Checks.

Checks should be made for fueling operations conducted by the government. Some, but not all, may be applicable per the procurement document for vendor fueling operations.

1. Aviation Fuel Nozzle Requirements (see Exhibit 13-3). If all of these items are not present and in good condition, discontinue the operation until corrected:

   - Non-locking discharge lever

   - Bonding cable with plug

   - Brass or aluminum nozzle

   - 100-micron screen in nozzle

   - Serviceable dust cap for nozzle spout

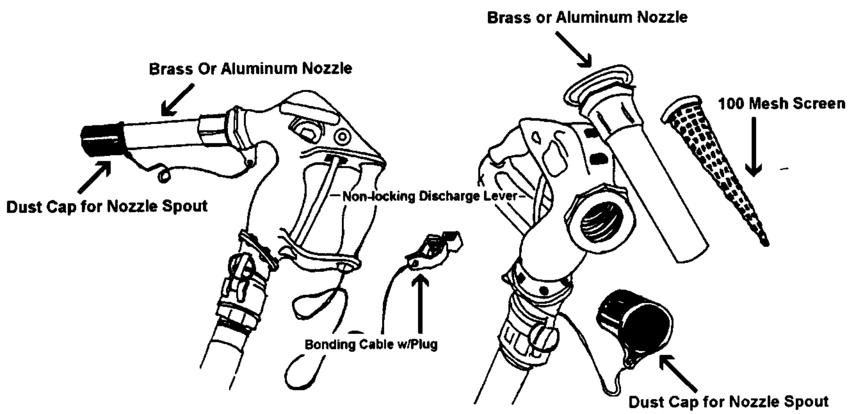
   - For government-operated fueling operations, it is advantageous if each nozzle has all fittings needed to conduct both closed-circuit and open-port fueling.

   - Each nozzle has two ground wires (not a procurement document requirement).

   One wire has an alligator clip on the end of it and the other wire should have a plug. These wires are used to bond the aircraft to a grounded 5-foot grounding rod (if available; not mandatory). The nozzle can be kept off the ground by hanging it on the grounding rod.

> WARNING: As an aircraft moves through the air, static electricity builds up. This also occurs when fuel moves through hoses. The aircraft, fuel nozzle, and pump assembly must be bonded to prevent sparks and explosions. Additionally, static electricity builds up more quickly in cold, dry air than in warm, moist air.

Exhibit 13-3: Fuel Nozzle Requirements



2. Nozzle Spout Screen. Check for cleanliness by:

   - Unscrewing nozzle spout and removing screen.
   - Tapping screen and collecting contents (if any) for indication of filter by-pass debris or hose deterioration.

3. Portable Fueling Equipment Pressure Differential Gauge(s). When this gauge is installed, check the pressure difference between the inlet side of filter (high psi) and the outlet side (low psi). Perform the following test:

   - Re-circulate fuel through the nozzle into the tank at maximum flow rate and note the difference. Some use two gauges, which requires that the operator perform mathematical calculations. Others use a single gauge, allowing a direct differential reading.
   - When pressure differentials are at or exceed the manufacturer’s recommendations, there is cause for concern. It is a very good indication the filter is holding back water and/or particles. The following should be performed:
   - Sample fuel in tank.

- Replace the element.
- Recheck the pressure differential with new element in place.

4. Flow Rate. Per specification on pump rating, determine flow rate in gallons per minute (GPM) by re-circulating fuel through the nozzle into the tank and timing the GPM. Substantially reduced flow rates from the minimum specified may be a good indication of a restriction in the element caused by particulate or water contamination. Considered that the pump may not meet specifications or the filter may need to be changed.

   - Remove the filter element in the single cartridge Velcon or the monitor from a three-stage system (inside the Teflon screen) and replace with new element.

   CAUTION: When changing elements, do not touch elements with dirty hands or gloves. Use clean gloves. Leave new element in package until the last step of placing element in canister.

   - Re-check the GPM flow.
   - While re-circulating, check total system for leaks.

H. Inspections and Quality Control.

Every precaution must be taken to maintain quality assurance for fuel. Items which must be checked and maintained on a daily, weekly, monthly, annual, or as-needed basis are covered in the discussion of Form HCM-3, Aircraft Fuel Facility Inspection Log in Appendix A. Inspections must be performed on the required basis, unless this is not feasible due to the remote location and infrequent use of a fueling site. In that case, a combination daily, weekly, and monthly inspection shall be performed prior to each use of the fueling site.

1. Daily Inspections. Fuel site and equipment must be visually checked daily for leaks. If found, local procedures for hazardous materials spills should be followed. In addition, check for water or particulate contamination in the fuel source by:

   - Checking the bottom of storage facility tanks for water, using water draw-off connections (sumps) and a visual test on a water-finding paste (allow the paste to remain in contact with the fuel for 30 seconds). Look for paste to change colors.
   - Checking for and removing any water from fuel vehicle tanks. A water check should also be performed after every reloading of the fuel container, washing of equipment, and after a heavy rain or snowstorm. Use the “clear and bright” test explained earlier in this chapter.
   - Visually checking for particulates.
   - Checking all three-stage and Velcon filter/separator manual water drains for water and other contaminants after each receipt of fuel, as well as on a daily basis. Draw off any accumulation of water.

- Checking and recording all fixed filter and filter/separator differential pressures while under full flow conditions. A graph-type log may be used in plotting differential pressure daily. Any sudden change or decrease in pressure differential may indicate a ruptured filter.
- Visually inspecting fuel vehicle and storage facilities, pumps, valves, and pipelines for leaks.
- Checking and cleaning hose nozzle screens, and if breaks are found, replacing the screens.
- Inspecting all hoses for abrasions, separations, or soft spots. Weak hoses should be replaced.
- Drawing off a sample daily from the downstream side of the filter. Sample should be collected in a clean, clear glass container and examined visually. Any visible water, dirt or filter fibers is unacceptable.
- Checking that dust caps are in place.

2. Weekly Inspections. All of the daily inspections, plus:
   - Inspect all fire extinguishers for broken seals, proper pressure, and recharge date. Recharge as necessary.
   - Check fuel flow rate GPM to nearest 1/10 gallon.
3. Monthly Inspections. All of the daily and weekly inspections, plus:
   - Check the condition of bonding and grounding wires, grounding clips, jacks and bonds.
   - Check condition of pumps, motors, and valves.
   - Check fuel source and fueling facilities for general condition, safety and appearance.
4. Annual Inspections. All of the daily, weekly, and monthly inspections, plus check electrical continuity with an ohmmeter.

I. Record Keeping.

See Appendix A, Form HCM-3, Aircraft Fuel Facility Inspection Log, for required record keeping. The individual responsible for fueling and/or the fuel source will keep a record containing the following information:

- Condition (clean, clear, bright, etc.) of the tank sump sample, filter sump sample and nozzle sample.
- Flow rate in gallons per minute to the nearest 1/10 gallon.
- Filter change, reason and date.

XI. Fuel Spills.

The information in this section is consistent with National Fire Protection Association (NFPA) Publication 407-90, "Standard for Aircraft Fuel Servicing," and should be used for both vendor and government-operated fueling operations.

Fuel spills are often the result of improper or careless operation of fueling equipment and lack of preventive maintenance of the fueling equipment. Close attention on the part of every person responsible for fueling is required to prevent fuel spillage. Personnel shall follow the guidelines listed below. See Chapter 12 for crash rescue and firefighting procedures regarding fuel spills.

CAUTION: All fuel spills, regardless of size, should be considered a fire hazard.

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

WARNING: Report all spills immediately; do not attempt to hide the fact that a spill occurred. There are severe civil and criminal penalties if a spill is not reported promptly.

Each incident is somewhat unique, but certain general principles apply to all cases. Every fuel spill involves several variables:

- Size of the spill
- Terrain on which the spill occurred
- Equipment
- Weather conditions
- Type of fuel and its flammability
- Proximity to aircraft or personnel
- Aircraft accident involved
- Emergency equipment and personnel available

A. Prevention.

Following good spill prevention practices will significantly reduce the chances of one occurring.

- Devote full attention to the fueling operation.
- Never leave any fuel nozzle unattended.
- Never tie or wedge the nozzle trigger in an open position.
- Frequently check the amount of fuel in the tank to prevent overfilling.

- Pumps, hand- or power-operated, shall be used when aircraft are fueled from drums. Pouring or gravity flow shall not be permitted.
- Kinks and short loops in fueling hose should be avoided.
- At remote fueling locations using portable fueling equipment, sandbags should be used to elevate the fittings to facilitate pre-operational checks and detection of fuel leaks.
- At remote fueling locations using portable fueling equipment, construct a berm around the fuel bladder to contain fuel in case of rupture for both temporary and semi-permanent systems.

B. Mitigation Procedures in the Event of a Spill.

> WARNING: During any fuel spill or leak, extreme caution must be exercised to avoid actions that could provide ignition sources to the fuel vapors. See Chapter 12 for procedures to follow to avoid ignition of a fuel spill resulting from a crashed aircraft.

Develop, keep current, and post a spill contingency plan. The procedures outlined below, with the addition of specific local material, should suffice. In addition to the plan, absorbent material should be available at the helibase or fueling location.

If a fuel leak develops or a fuel spill occurs during aircraft servicing, follow emergency procedures without delay. If the leak continues, or the spill is a large one, all non-essential personnel should leave the area immediately until the hazard is neutralized, repairs are made, and the area is safe. Follow these steps:

- Alert the airport fire crews or follow established emergency procedures applicable to a remote fueling operation, as outlined below.
- Stop the flow of fuel and the fueling operation immediately upon discovering leakage or spillage:
- If fuel is leaking or spilling from a fuel servicing hose or equipment, the emergency fuel shutoff valve must be actuated immediately.
- If the fuel is leaking or spilling from the helicopter at the filler opening, vent line, or tank seam, fuel delivery must be stopped immediately.
- If the spill occurs during open port (hot) refueling operations, the Pilot will make the decision on moving or keeping the helicopter in place. If the latter, then all electrical power must be shut down and the helicopter evacuated.
- Before the helicopter is put back into service, it must be thoroughly checked for damage and for flammable vapors that may have entered fuselage areas.
- Small spills involving an area of less than 18” normally pose little danger. However, personnel staffing fire extinguishers during start-up procedures should stand by until the helicopter departs the area of the spill because engine exhaust could ignite the

spill. These spills contain such a small amount of fuel that they may be absorbed and placed in an approved hazardous materials container to await disposal.

NOTE: New products to absorb fuel spills are available that reduce or eliminate the need for hazardous material containers. These new products should be considered for most fuel spills.

- A fire guard should be posted for other small or medium static spills - not over 10 feet on any side nor over 50 square feet in area. The fire guard should have one or more fire extinguishers with at least a 20 B rating. Local regulations and procedures must be followed, but in most cases absorbent materials or emulsion compounds should be used to absorb the spilled fuel, especially if aviation gasoline (AVGAS) or low flash point fuels are involved. The contaminated absorbent should be placed in an approved container to await disposal.

- Large spills - over 10 feet on any side or over 50 square feet in area - or smaller spills continuing to enlarge (non-static) should be handled by the fire department or, if in a remote location, by a ground engine. Anyone in the area of a large spill should move upwind of the spill at once.

NOTE: Aircraft fuels will damage some types of ramp surfaces. Spilled fuel should be picked up as quickly as possible if operating from a hard-surfaced ramp.

- All fuel spills resulting from an aircraft crash or ground collision should be blanketed with foam, if available, to prevent ignition and to prevent further damage to the equipment.

CAUTION: Wildland fire foams are not adequate suppressants for fuel spills. Foams must be approved for hydrocarbon fuels.

C. Fuel Spillage on Personnel.

If the fuel handler’s clothing becomes soaked with fuel, the individual should:

- Avoid ignition sources.
- Leave the fueling area immediately.
- The act of removing clothing creates static electricity. Wet fuel-soaked clothes with water before removing. If water is not available, the person should be grounded to prevent sparks before removing clothes.
- Wash fuel off skin with soap and water as soon as possible.
- Seek medical attention.

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

CHAPTER 14: HELICOPTER MAINTENANCE.

I. Introduction.

Standards for vendor aircraft maintenance are found in the procurement document (USFS Rental Agreement, OAS Aircraft Rental Agreement, the National CWN contract, state or local agreements, etc.).

NOTE: It is highly recommended that if questions arise concerning helicopter maintenance that an agency maintenance inspector be immediately consulted.

II. Inspection.

Upon aircraft arrival, the Helicopter Manager/Flight Manager shall determine that the following has been accomplished. See Chapter 5.

A. All Procurements.

The aircraft has been inspected by maintenance specialists according to agency inspection criteria. There are interagency standards common to USFS, OAS, and some state and local agencies.

B. Military Aircraft.

Military aircraft used under a Letter of Agreement (LOA) or Memorandum of Understanding (MOU) are maintained in accordance with the terms of the agreement (usually military or National Guard standards).

III. Pilot Functioning as a Mechanic.

A Pilot may function as a mechanic when he or she holds a valid Airframe and Powerplant (A&P) mechanic certificate, meets experience requirements as specified in the procurement document, and the terms of the document do not prohibit this activity. When a Pilot functions as a mechanic, duty day and/or flight time limitations may be affected, per the procurement agreement or agency directive.

IV. Pilot Performing Preventative Maintenance.

(Note that servicing an aircraft with fuel and oil is not considered to be maintenance.)
Pilots who are not certificated mechanics may perform preventative maintenance if they have completed an approved training program and are authorized in writing by the vendor (certificate holder) to perform said maintenance. Each item a Pilot is authorized to perform

must be specified in writing. Examples of preventative maintenance which may be authorized include:

- Removal, inspection and reinstallation of magnetic chip detector plugs.
- Removal and installation of passenger seats.

V. Mechanic Approval.

Mechanics shall be approved prior to use. See Chapter 5.

VI. Maintenance Ferry Flight.

Ferry flights may be necessary to relocate an aircraft to a suitable maintenance location for scheduled or unscheduled maintenance purposes. Managers should remember that if maintenance time requirements have been (or will be) exceeded during flight, government passengers are not allowed on board the helicopter, nor may the vendor perform any government-ordered missions.

The sole purpose of the flight must be to ferry the helicopter to a maintenance facility or location where the work can be performed.

> EXAMPLE: A 100-hour inspection is due in 0.5 hours, but it will take 0.8 hours to fly to the vendor's maintenance facility. Although the manufacturer and/or the FAA may allow flight up to 10% over the scheduled maintenance timeframe (that is, may fly up to 110 hours since the last 100-hour inspection), flight may be performed only for the purpose of ferrying the helicopter to a maintenance facility.

If the maintenance time limit will not be exceeded during the ferry flight, the helicopter may be used to perform government work as part of the flight. Be aware, however, that it will be a revenue flight, and, as with any government-ordered flight, there should be a justifiable reason for payment.

VII. Scheduled Maintenance.

Helicopters shall be maintained in accordance with the Vendor's Operation Specifications, applicable Federal Aviation Regulations, and the manufacturer's recommendations. Under normal circumstances, scheduled inspections are not to be overflown. Scheduled maintenance should be performed before or after daily standby or as approved by the Contracting Officer or designated representative.

The following inspections are to be performed by authorized personnel and may require a logbook entry:

A. Duties Authorized to Be Performed by the Pilot.

1. Daily Preflight Check. The Pilot will perform a daily preflight check prior to the first flight of each day. The Pilot may make an entry in the helicopter's logbook or record that such an inspection has been performed. The pre-flight inspection is included in the Pilot's 14-hour duty day.
2. Turbine Engine Power Assurance Check. A Power Assurance Check shall be accomplished on the first day of operation and thereafter within each 10 hour interval of contracted flight operation unless prohibited by environmental factors (e.g. weather, smoke). The power assurance check shall be accomplished by the contractor in accordance with the Rotorcraft flight manual or approved (per OAS/USFS maintenance) company performance monitoring program. The results shall be recorded and either kept in the helicopter or at the assigned work location. A current record of the power check will be maintained with the aircraft under the contract and any renewal period.

   Helicopters with power output below the minimum published performance charts shall be removed from service. The below minimum power condition shall be corrected before return to service and contract availability.

   > NOTE: Turbine Engine Power Assurance Checks for some aircraft cannot be trended. The reading may be correct or incorrect, or above or below specification, instead of having a numeric value.

   See procurement document and Appendix A for more specific information on Power Checks.

3. Test Flight. Test flights do not have a specified minimum flight time requirement. Test flights will normally be of sufficient duration to determine that the item repaired, replaced or adjusted operates correctly. The Pilot is required to make an entry in the helicopter's logbook or record. Passengers are not permitted to be aboard the aircraft during test flights.

B. Inspections or Maintenance Performed by the Mechanic.

1. 50/100-Hour Inspections. The vendor shall provide the necessary maintenance personnel and equipment to inspect and service the aircraft in the field. Under normal circumstances, 50/100-hour inspections should be performed before or after daily standby or as approved by the Contracting Officer or designated representative.
2. Annual Inspection. An annual inspection is required once every 12 calendar months. This inspection is identical to the 100-hour inspection in scope and detail, but must be performed by a licensed Airframe and Powerplant (A&P) mechanic with Inspection Authorization (IA). This inspection shall not be overflown.
3. Approved Aircraft Inspection Program (AAIP). In lieu of 100-hour/annual inspections, phase inspections may be authorized by the vendor's maintenance program. Phase inspections can normally be accomplished in a very short period of time, since only a portion of the aircraft is inspected at each phase.

4. Time/Calendar Life Inspections. Various engine and airframe components require hourly or calendar inspections or replacement. These inspections will normally be performed in conjunction with other inspections. These inspections shall not be overflown unless the vendor has an FAA-approved extension from the manufacturer.

5. Airworthiness Directives and Service Bulletin Compliance. Special inspections may be required by the FAA or by the manufacturer. These inspections must be accomplished within the timeframes indicated in the directive or bulletin. The vendor is required to provide a compliance list at the designated base.

VIII. Unscheduled Maintenance.

Chart 14-1 lists those steps to be taken by USFS and DOI Helicopter Managers for proper documentation of unscheduled maintenance, and individual(s) to notify for each type of mechanical problem and return to contract availability approval. State and local agencies should consult agency directives.

IX. Mechanic Subsistence and Travel.

Although not specifically a maintenance issue, the question of whether to pay for mechanic subsistence and travel often arises. The Helicopter Manager should consult the procurement document for requirements.

Chart 14-1: Required Actions To Be Taken By Helicopter Manager For Maintenance Problems and Return To Contract Availability

SITUATION	REQUIRED ACTION(S) DOI AND USFS
Failure of Minor Components (Gauges, Chip Detectors, etc.)	1. Document in Daily Diary 2. Approval by vendor's mechanic 3. Notify agency maintenance inspector for return to contract approval 4. Discuss with agency maintenance inspector if SAFECOM should be submitted.
Major Components (Transmission, Engine, Rotor Blades, Main Rotor Hub, etc.)	1. Immediately notify maintenance inspector and PI/COR 2. Document in Daily Diary 3. Approval by vendor's mechanic 4. Return to contract availability requires verbal approval or physical inspection by agency maintenance inspector (will make determination if physical inspection is necessary) 5. SAFECOM should be submitted. 6. Notify contracting officer within 24 hours

CHAPTER 15: HELIBASE AND HELISPOT MANAGEMENT AND OPERATIONS.

I. Introduction.

Helibase management requires additional personnel, planning, completion of checklists and mandatory forms, and increased controls (vehicle traffic, airspace, communications, etc).

Prior to reading this chapter, it may be valuable to review the duties and responsibilities of both helicopter and helibase management positions found in Chapter 2.

Useful tools that the Helibase Manager and subordinate positions can use to plan and conduct operations include the:

- Daily Helicopter Operations Briefing/Debriefing Checklist (see Appendix F)
- Helibase Manager's Reminders List (see Appendix H)
- Aviation Publication and Helicopter Operations Ordering List (see Appendix K)

It is also essential that the Helibase Manager review:

- Appendix A, Helicopter Management Forms and Checklists. Many of the forms are relevant to helibase operations and may supply information necessary to the completion of helibase management forms.
- Appendix B, Helibase Management Forms and Checklists. These are closely tied to the helibase planning, operational procedures and requirements discussed in this chapter.

II. Coordination with Project Aviation Manager or Air Support Group Supervisor and Air Operations Branch Director.

Coordination, communication and cooperation with these functions is essential to the success of helibase operations.

Correct and timely identification of problems encountered, along with corrective action already taken or to be taken, will do much to gain the support of supervisory air operations personnel. This process is a two-way street. If the Helibase Manager is not getting timely or correct information from supervisors, then this problem must be quickly identified. Chart 15-1 outlines essential areas of coordination among air operations staff and other incident or project personnel.

III. Helibase Briefing and Debriefing.

The importance of providing complete briefings for all vendor and government helibase/helispot personnel prior to the start of operations, as well as debriefings at the end of an operational period, cannot be overemphasized.

Two of the best tools available to the Helibase Manager in planning and monitoring all operations are the Helibase Manager's Reminders List and the Daily Helicopter Operations Briefing/Debriefing Checklist. These are the primary management tools and job aids of the Helibase Manager. A complete review of all items will greatly promote the safety and efficiency of helibase/helispot operations. <u>It should be remembered, however, that completion of forms and checklists does not replace good management and personal communications.</u>

A. Daily Helicopter Operations Briefing/Debriefing Checklist.

For incidents, the use of the Daily Helicopter Operations Briefing/Debriefing Checklist is mandatory at all multiple-helicopter bases by the start of the second operational period. It shall be completed on a daily basis thereafter.

For projects, use of the checklist is mandatory on the first day at all multiple-helicopter bases. It shall be completed on a daily basis thereafter.

The Daily Helicopter Operations Briefing/Debriefing Checklist is designed to enable the Helibase Manager to conduct comprehensive briefings and debriefings. Major areas covered are Organization and Personnel, Communications, Landing Areas, Safety, Operations, and Administration. One Checklist may be used for a seven day period, after which a new one must be initiated.

Anyone who cannot attend briefings or debriefings must be individually briefed or debriefed by the Helibase Manager or designee, using the Daily Helicopter Operations Briefing/Debriefing Checklist and other helibase forms (for example, Facilities, Hazard, And Flight Route Map, Helispot Information Summary, etc).

If any item on the Daily Helicopter Operations Briefing/Debriefing Checklist has not been accomplished, approval is required from the Incident Commander, Project Aviation Manager, or designee (for example, the Air Operations Branch Director). Detail the deviation on the Checklist, a General Message Form, or other format. A signature from the official approving the deviation is required. This documentation must be attached to the Checklist.

Pilots are required to sign the Daily Helicopter Operations Briefing/Debriefing Checklist on a daily basis.

> NOTE: If the Helibase Manager arrives at an incident where operations are already proceeding, it is advisable, unless life or property is being threatened, to conduct a short briefing to review the Checklist. The Helibase Manager should make it clear to the air operations staff that there will be a slight operational delay while the initial briefing is accomplished. The time spent accomplishing this will result in a smooth transition from initial/extended attack to incident management helibase operations, and should increase safety awareness and efficiency significantly.

B. Helibase Manager's Reminders List.

The use of the Helibase Manager's Reminders List is optional. It is recommended that the Helibase Manager review it upon arrival, with additional review at convenient times throughout each day and after nightly debriefings. It is organized in a sequential and logical manner to lead the Helibase Manager and subordinate personnel through all phases of helibase operations:

- Helibase and Helispot Site Selection
- Personnel and Organization
- Communications
- General Planning Information and Organization Needs
- Operations
- Demobilization and Rehabilitation

C. Briefing/Debriefing Schedule.

Briefing and debriefing schedules vary according to incident or project requirements. Chart 15-1 is provided as a guideline.

- Note the necessity for the Helibase Manager and primary staff (DECK, TOLC) to provide for sufficient time to prepare for the morning briefing. Adequate preparation results in concise and comprehensive briefings.
- During complex, high-activity operations, briefings and debriefings should be scheduled to fall within the duty day of the majority of incident or project Pilots. Separate briefings or debriefings shall be held with Pilots who may miss the group briefing or debriefing due to a staggered duty day schedule.
- If long shifts are encountered, the Helibase Manager should consider shifting out on a rotating basis. For example, one day the Helibase Manager comes on duty late, and the DECK presents the morning briefing. The Helibase Manager conducts the nightly debriefing. This requires coordination and communication between the two individuals, but is effective in reducing fatigue. It should also be considered for other helibase personnel.

Chart 15-1: Briefing/Debriefing Schedule

TYPE	TIME FRAME	ADDITIONAL CONSIDERATIONS
Briefing	Depending upon complexity of operations and Pilot duty day requirements, provide for adequate time prior to the “Commence” time shown on the Incident Air Operations Summary (ICS-220). Remember, part of this period must be provided for helicopter preflight prior to the “Commence” time. Adjust times as necessary, but be prepared to meet “Commence” times identified.	The Helibase Manager and primary staff should be preparing for the briefing at least 15-30 minutes prior to the briefing’s scheduled start. All operational and safety problems identified during the previous nightly debriefing should be corrected. Remember to review the Helibase Manager’s Reminders List.
Debriefing	The debriefing should be accomplished as soon as possible after the completion of helibase operations. Remember for next-day planning purposes that vendor personnel are “On Duty” until the debriefing is completed. Notify the AOBD or Project Aviation Manager if completion time affects next day’s plan. At this time, the next day’s plan (if available) should be reviewed.	Ensure that feedback is obtained from everyone, including contractor personnel, concerning the day’s activities. Operational and safety problems should be either immediately corrected or brought to the attention of the ASGS/AOBD or Project Aviation Manager. Cost reports must be submitted to the Helibase Manager or Aircraft Timekeeper by all Helicopter Managers at the end of each operational period.

IV. Helibase Personnel and Organization.

Helibase organizations vary in size and configuration depending upon a variety of factors including incident or project complexity, number of assigned aircraft, range and type of missions, and experience level of personnel assigned.

The assignment of trained and qualified personnel to each helibase function is critical to the safety and effectiveness of operations. Refer to Section I of the Daily Helicopter Operations Briefing/Debriefing Checklist in Appendix F for personnel and organizational items that must be checked prior to the start of operations. Refer also to Appendix H, Helibase Manager’s Reminders List, Section III, for similar considerations.

The position of the Helibase Manager is common to all helibase organizations. This individual is responsible for the safety and efficiency of all helibase and helispot operations.

If an operation is not functioning smoothly, the Air Support Group Supervisor and/or Air Operations Branch Director should consider:

- Assigning a Deputy Helibase Manager (fully-qualified Helibase Manager).
- Splitting the operation into two or more helibases at different locations to reduce single-location complexity (there are negative aspects of this which may outweigh the advantages).
- Replacing the Helibase Manager. This option should only be considered if it is determined that the Helibase Manager is unable to manage the helibase appropriately. Supervisory personnel should also consider that failures at the helibase may be the result of failures in other parts of the Project or Incident Management Team.

V. Helibase Setup and Layout.

See Exhibit 15-2 for a typical helibase layout. Section I, Helibase Site Selection and Layout, in the Helibase Manager's Reminders List (Appendix H) should be reviewed during initial site selection.

A. Time Frames.

A Helibase Manager who can manage and delegate responsibilities effectively should have accomplished all of the items discussed in this chapter, plus those specified on the Helibase Manager's Reminders List, by mid-day of the second operational period on incidents. With more lead time available on a project, all items should be implemented or operational prior to commencement of the project.

On incidents, accomplishing all of these tasks may require additional work after the end of the shift on the first day. The Helibase Manager should not attempt to accomplish everything alone. Share the workload among helibase staff. Spending this additional time is well worth the effort in terms of achieving a smooth, safe operation the next day.

B. Obtaining Necessary Equipment.

Consult Appendix K for ordering information. The Helibase Manager should consult this list both at the beginning of the incident or project and frequently thereafter. Appendix K contains information on how to use the ordering list in conjunction with the supply unit.

Commonly needed items include, but are not limited to:

- Radios and radio kits
- Ground vehicles

- Crash rescue and evacuation kits
- Helicopter support kits, plus additional fire extinguishers, wind socks, pad markers, signs, lead lines, swivels and cargo nets
- Personal protective equipment
- Portable tanks and water bags
- Tents
- Aerial ignition equipment
-
- Miscellaneous administrative and office supplies

HINT: At larger helibases with significant cargo transport, assign an Ordering/ Distribution Manager to the helibase. This individual's function is to coordinate the ordering, delivery and distribution of supplies and equipment to the helibase from the supply unit.

C. Facilities and Layout Considerations.

Refer to Exhibit 15-2. (Once the helibase is established, complete the Helibase Facilities, Hazard, and Flight Route Map.)

1. Operations and Communications Area. One of the first priorities is the establishment of a helibase operations and communications area. See Chapter 4 for additional discussion of this area and its needs.

   a. Location. This area should command a full view of the helibase operational area.

   b. Set up. Set up communications equipment in an area in which the TOLC and Helibase Radio Operator can function effectively and communicate readily with the Helibase Manager and DECK. The following set-ups are usually acceptable:

      - Outside a helicopter crew chase truck equipped with side compartments to handle communications needs
      - Inside a tent, with a full view of the helibase
      - In a communications trailer designed for air operations use

c. Communications Equipment. The use of radio headsets to counter helibase noise is strongly encouraged. Various radio kit configurations are listed in Appendix K. Refer to Chapter 4 for a discussion of various communications functions.

> IMPORTANT NOTE: The Helibase Manager should ensure that assigned radio equipment and frequencies meet the needs for ground-to-ground, air-to-ground, and air-to-air functions.

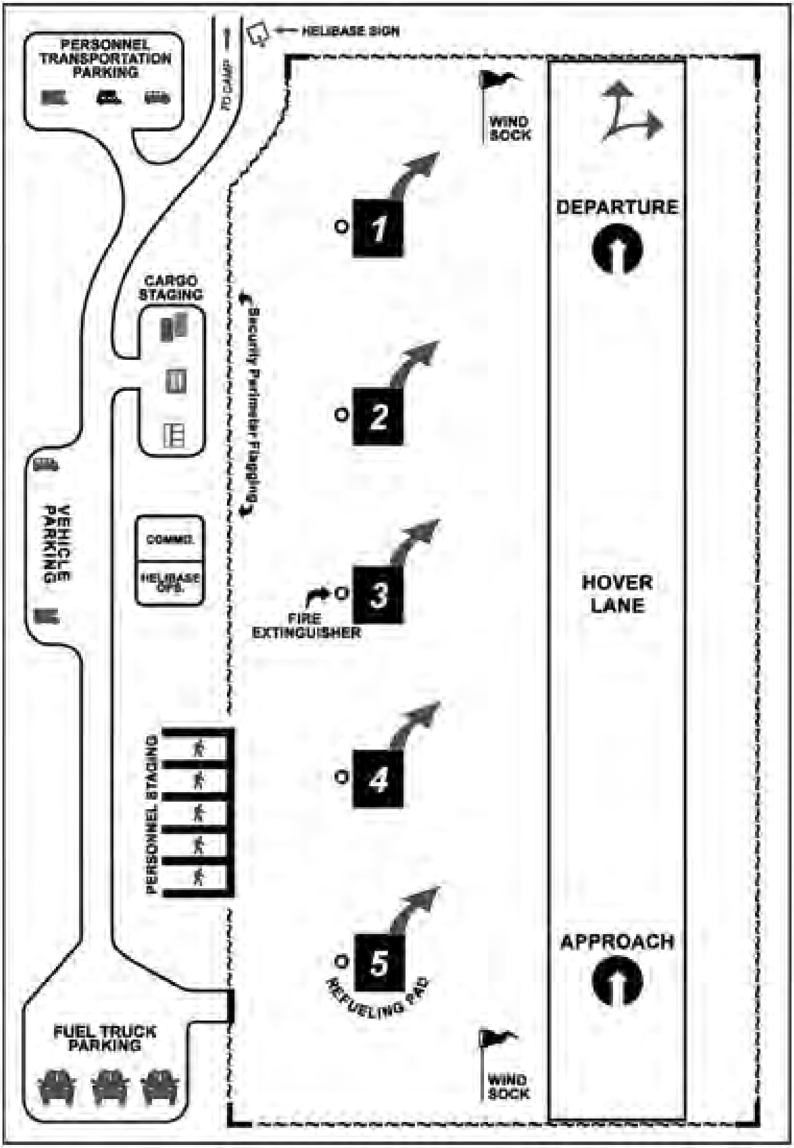
2. Wind Indicators.

- Set up wind indicator(s) in location(s) visible to all helicopters. Indicators should be placed on both the approach and departure paths.
- Indicators should be located at sufficient height to give a true indication of wind direction that is not affected by adjacent vegetation or terrain.
- They should be placed in location(s) that are unaffected by rotor wash.

3. Approach and Departure Paths.

- Establish approach and departure paths with Pilot input and in conformance with requirements in Chapter 8.
- Establish hover lanes for access to various areas on the helibase.
- Enter information on the Helibase Facilities, Hazard, and Flight Route Map.

Exhibit 15-2: Typical Helibase Layout



4. Touchdown Pads and Safety Circles.

    - Establish touchdown pads and safety circles in conformance with requirements in Chapter 8.
    - Group pads by helicopter types. Also separate pads, or groups of pads, by type of flight mission (for example, external cargo transport pads separate from personnel transport pads).

    > CAUTION: Establish external load pad(s) to avoid overflights of other pads, helibase, or camp.

    - Establish special pads as necessary for fueling, maintenance, retardant mixing, or aerial ignition (refer to Chapter 13 for fueling separation requirements).
    - Enter information on the Helibase Facilities, Hazard, and Flight Route Map.

5. Vehicle Parking and Movement.

    - Establish vehicle parking area for crash rescue vehicle (if assigned), fuel, cargo, personnel transports, visitors, etc.
    - Establish procedures for vehicle movement (access to helibase, refueling, delivery of cargo, etc.).
    - Enter information on the Helibase Facilities, Hazard, and Flight Route Map.

6. Security. For special security requirements during law enforcement operations, see Chapter 16.

    - Cordon off the helibase to control vehicle and foot traffic.
    - Request security as needed.

7. Personnel and Cargo Staging Areas.

    - Establish staging areas for personnel and cargo.
    - Use pennant flagging for crew “holding areas,” as well as for entry-egress routes to pads.
    - Establish the cargo loading and external load area(s) so that other helicopters are not overflown, and so that upon either approach or departure with a load, the helicopter does not fly over inhabited areas. See Chapter 8.
    - If moderately or heavily traveled roads will be overflown on approach or departure, a road guard may need to be posted. Consult with local law enforcement officials on the posting of road guards. If county, state, or federal highways are involved, the appropriate law enforcement agency is responsible for traffic control.
    - Enter information on the Helibase Facilities, Hazard, and Flight Route Map.

8. Weighing. Set up scales for weighing personnel and cargo.

> HINT: Scales may be set up in both the Food and Supply Units to weigh cargo that will be sent to the helibase for transport to the line. Assigning a Loadmaster from the helibase to ensure cargo arrives properly packaged, weighed, and labeled with destination is highly effective. This system also works well on large projects.

9. Signing. Post warning signs as required, including helibase, speed limit, cargo area, personnel staging, parking, no smoking, etc.

10. Sanitation.

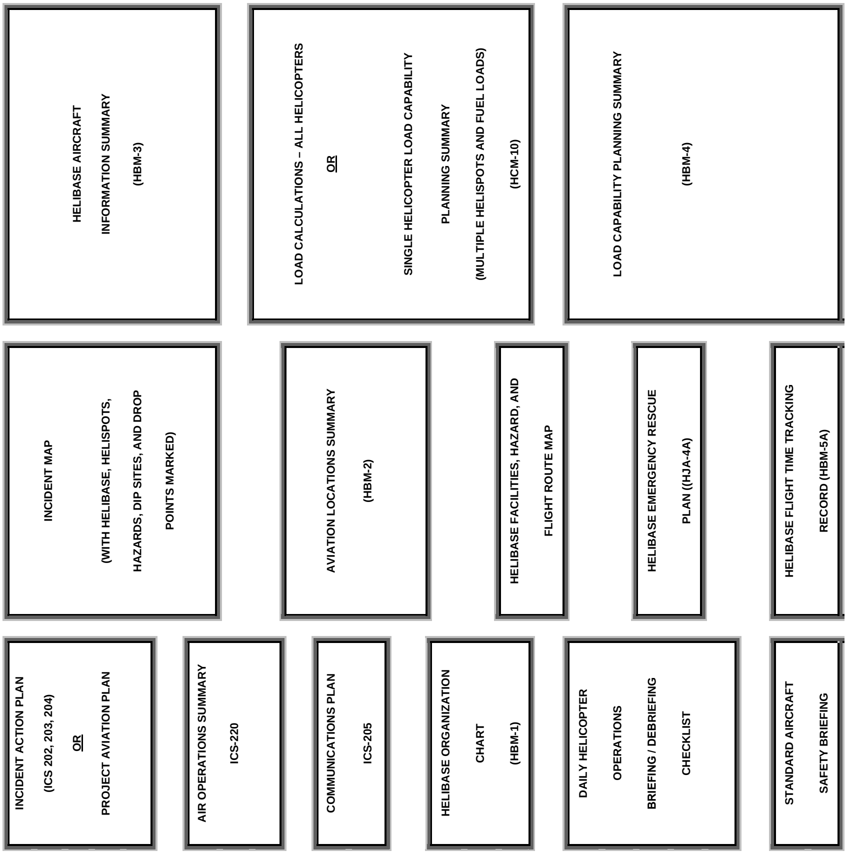
    - Provide an adequate number of portable toilet facilities to meet the needs of helibase personnel and crews in transit through the helibase.
    - Order enough trash barrels or dumpsters to handle both the helibase waste needs and the backhaul from helispots.
    - Establish a separate disposal area for used batteries and other hazardous materials such as saw gas, oil and grease from helicopter maintenance, etc.
    - Enter information on the Helibase Facilities, Hazard, and Flight Route Map.

11. Display Board. Refer to Exhibit 15-3. A Display Board is an essential part of any helibase operation to facilitate information posting, exchange, and briefing requirements.

    - The display board should be located near the helibase operations and communications area for ease of posting and referring to information, conducting briefings and debriefings, etc.
    - 4’ by 8’ sheet(s) of plywood work well. Ensure that the board has adequate support to withstand high winds and rotor wash.
    - Cover with plastic to protect information from adverse weather.
    - For incidents, required information should be completed and posted on the display board no later than mid-day of the second operational period. For projects, it should be posted prior to the commencement of operations. Unless noted as optional, the following should be posted on the display board.
    - Incident Action Plan (ICS Forms 202, 203, 204, and 205 minimum) or Project Aviation Plan.
    - Incident or Project Map.
    - Air Operations Summary (ICS-220).
    - Helibase Facilities, Hazard, and Flight Route Map.
    - Helibase Organization Chart (HBM-1).
    - Aviation Locations Summary (HBM-2).

- Helibase Aircraft Information Summary (HBM-3) (optional).
- Helibase Flight Time Tracking Record (HBM-5A) (optional).
- Daily Helicopter Operations Briefing Checklist (HJA-1).
- Load Calculations for representative elevations and temperatures for all helicopters assigned, or Helicopter Load Capability Summary - Multiple Helispots and Fuel Loads (Form HCM-10).
- Allowable Payload Chart (HBM-4).
- Emergency Rescue Information (Form HJA-4A).
- Standard Aircraft Safety Briefing.

Exhibit 15-3:Example of a Helibase Display Board (4'x8' Plywood)



12. Helibase Eating Area and Arrangements. An area for eating meals should be established and posted on the Helibase Facilities, Hazard, and Flight Route Map.

The Helibase Manager should coordinate immediately with the Project Aviation Manager or the Air Support Group Supervisor regarding meal arrangements.

While every situation is different, it is generally the case that helibase shifts do not coincide with the main camp's meal schedule. In order to minimize the disruption to the caterer, it is recommended that arrangements be made so that both helibase government and vendor personnel eat at the helibase.

At a minimum, cold breakfast items such as cereal, fruit, rolls, milk and juice will provide an adequate breakfast prior to the morning briefing.

If the caterer's schedule is such that the kitchen shuts down prior to the completion of the nightly debriefing, dinner in hot food containers should be provided.

NOTE: In Alaska, personnel are supplied with Meals-Ready-To-Eat (MRE's) for the first three days. Thereafter, fresh food boxes may be provided. Government and vendor personnel are expected to prepare their own meals.

13. Helibase and Vendor Personnel Sleeping Area. One or two general sleeping areas for personnel should be immediately designated and posted on the Helibase Facilities, Hazard, and Flight Route Map. Sleeping areas should be well away from the helibase operational area, hover lanes, and flight paths to avoid the effects of rotor wash.

NOTE: The Helibase Manager should make his/her sleeping area known to the Air Support Group Supervisor or Project Aviation Manager in case an emergency arises during the night.

If vendor personnel are required to stay at the incident, then the Helibase Manager is required to ensure that the contractual requirements for adequate rest are met. At a minimum, cots and tents should be ordered.

To meet aviation safety objectives, the effects of Pilot fatigue and inadequate rest facilities must be recognized. It is recommended that Pilot fatigue factors be reduced by:

- Allowing Pilots to sleep in motels or other available facilities, provided that such a policy does not significantly interfere with Pilot duty day/flight time limitations.
- Modifying the above by allowing Pilots to sleep in motels or other available facilities on a rotating basis every third night.

HINT: If motels are not ground accessible within a reasonable time, reduce the effect on duty days by flying all Pilots to the rest location in one or two aircraft, instead of allowing each Pilot to fly in.

- In Alaska, helicopter vendors are advised in the procurement document to provide tents for their personnel. Sleeping bags, plastic sheeting and bug nets are provided at remote helibases. Housing may be available in villages.
- All sleeping areas shall be policed prior to the morning briefing and all equipment and supplies secured.

VI. Helispot Considerations.

A. Personnel and Organization.

Proper helispot management is essential for safe and efficient operations. The Helibase Manager is responsible for ensuring adequate numbers of personnel are assigned.

As a general rule, helispots should have a minimum of two people assigned, although more than two may be necessary (for example, at a camp with significant transport of personnel or cargo). Consider assignment of a Type II or I Helibase Manager to helispots at large camps.

HECMs that manage helispots need to ensure that their staff understands the responsibilities and authorities of helispot management.

Assignments will normally be made at the helibase briefing prior to the start of the operational period. For helispot personnel who stay at camps or helispots overnight, a briefing on the intended operations for the day should be relayed by radio, and input solicited for the nightly debriefing.

Personnel managing helispots should work and communicate closely with the helibase and incident supervisor for the area on both logistical and tactical needs at the helispot.

At the end of each shift, all those who used the helispot should offer a constructive critique of the operations there.

B. Establishing Helispots.

On incidents, the Air Operations Branch Director is responsible for the establishment of all helispots, though this responsibility may be delegated to the Air Support Group Supervisor or Helibase Manager. On projects without a full aviation staff, the Helibase Manager is responsible. In either case, close coordination with, and in many cases, authorization by the local Resource Advisor to construct helispots is required. Refer to Chapter 8 for additional information.

Form HBM-2, Aviation Locations Summary, should be initiated and updated as new helispots are established. Its primary use is for Pilot safety briefings.

All helispots must be approved regarding hazards and capability (HIGE or HOGE) by a trained and authorized individual. Pilots are a good source for this information.

C. Necessary Equipment.

It is essential that all tools and equipment to perform the job, including initial attack firefighting gear, be obtained by personnel managing the helispot. This equipment includes:

- One (1) 20-pound, dry chemical, 40 B:C rated fire extinguisher
- Pad marker with nails (initial establishment of spot)
- Radio with extra batteries
- Wind Indicator(s)
- Scales (recommended, but not required)
- Fiber Tape
- Manifest Book(s)
- Pocket Calculator
- Passenger Aircraft Safety Briefing Cards
- A list of allowable payloads for each helicopter assigned to the helibase (HIGE and HOGE) for all helispots, since they may be assigned to another spot during the course of the day; copies of Form HCM-11, Single Helicopter Load Capability Planning Summary - Multiple Helispots and Fuel Loads, for each helicopter works well for this purpose
- Food and water
- Initial attack gear
- Overnight gear (even if the plan is to return the crew to the helibase)

IMPORTANT NOTE: These items are not required for unimproved landing sites which are used only infrequently. However, if the site is used on a recurrent basis as a personnel or cargo destination, then it becomes a helispot and applicable requirements should be met.

D. Facilities and Layout Considerations.

Helispot personnel are usually the first personnel to be flown to a helispot, both for initial construction and improvement and on a daily basis thereafter in preparation for personnel and cargo transport. The helispot shall not be declared operational (that is, ready to receive personnel or cargo) until the helicopter crewmembers assigned to that helispot have informed the helibase that the spot is ready.

Some of the considerations regarding facilities and layout of helibases also apply to helispots. Refer to Section II, Helispot Site Selection and Layout, in the Helibase Manager's Reminders List (Appendix H) for items which should be checked during the establishment of any helispot. Also refer to Chapter 8, Helicopter Landing Areas, for requirements. Items to consider include, but are not limited to:

- Wind Indicators. Considerations are the same as with helibases.
- Approach and Departure Paths. Establish approach and departure paths with Pilot input in conformance with requirements in Chapter 8.
- Touchdown Pads and Safety Circles. Establish touchdown pads and safety circles in conformance with requirements in Chapter 8.
- Vehicle Parking and Movement. Though road access to a helispot is the exception rather than the rule, the helispot may have road access. If so, consult guidelines for helibases.
- Security. The helispot may have need for security. If so, consult guidelines for helibases. For special security requirements during law enforcement operations, see Chapter 16.
- Personnel and Cargo Staging Areas. Although helispot staging areas do not need to be as elaborate as those for the helibase, establish areas for personnel and cargo well away from the landing pad. If necessary, use pennant flagging for crew "holding areas," as well as for entry-egress routes to the helispot landing pad.
- Weighing. If scales are available, use them for the accurate weighing of personnel and cargo.
- Signing. Post warning and informational signs (helispot, no smoking, etc.) as appropriate.

VII. Communications.

Communications is one of the most important aspects of helibase operations. A good communications plan and network will greatly increase chances of success. Conversely, a poor plan with inadequate equipment is a guarantee of failure.

Communications problems must be solved immediately. Close coordination with the Air Operations Branch Director or Project Aviation Manager is essential. Refer to Chapter 4 for a discussion of communications concerns. Brief all involved using the Aviation Communications Plan included in Chapter 4.

- Section II, Communications, in the Daily Helicopter Operations Briefing/Debriefing Checklist must be completed on a daily basis prior to the start of operations.
- Section IV, Communications, in the Helibase Manager's Reminders List should be reviewed as needed by the Helibase Manager.

VIII. Safety.

Safety items as specified in Section IV in the Daily Helicopter Operations Briefing/Debriefing Checklist must be reviewed on a daily basis prior to the start of operations. The Helibase Manager should maintain constant awareness of other safety items not on the Checklist that need review.

IX. General Planning, Information and Organization Needs.

- Appendix B contains guidance and direction concerning both required and optional planning tools available to the Helibase Manager.
- The Helibase Manager should review Section V, General Planning, Information and Organization Needs, in the Helibase Manager's Reminders List.

X. Operations.

- Section V, Operations, in the Daily Helicopter Operations Briefing/Debriefing Checklist must be completed on a daily basis prior to the start of operations.
- The Helibase Manager should review Section VI, Operations, in the Helibase Manager's Reminders List.

XI. Demobilization of Aircraft and Personnel.

The Helibase Manager should review Section VII, Demobilization, in the Helibase Manager's Reminders List when it is anticipated a helicopter will be demobilized. Although use of Form HBM-11, Helicopter Demobilization Information Sheet, is optional, it facilitates the orderly demobilization of air and associated ground resources.

XII. Rehabilitation.

The Helibase Manager should review Section VIII, Rehabilitation, in the Helibase Manager's Reminders List whenever a helispot or helibase will be placed in inactive status or will be permanently demobilized. Consult the local Resource Advisor for specific rehabilitation standards.

XIII. Demobilization and Deactivation of the Helibase.

Aside from the physical cleanup considerations of demobilization addressed in Section VIII, Rehabilitation, in the Helibase Manager's Reminders List, the Helibase Manager is responsible for ensuring that a complete Helibase File is left with the Documentation Unit Leader on incidents or the Project Manager on projects. This file should consist of the items specified in Section V of the Helibase Manager's Reminders List.

XIV. Miscellaneous Considerations.

A. Operations Involving Military Helicopters.

Operations involving use of military helicopters can increase the complexity of a helibase operation. For aviation operations using Active Duty/Reserve Military helicopters or National Guard units officially "federalized" by Department of Defense, refer to Chapter 70 of the *Military Use Handbook* for specific policy and procedural information.

The use of National Guard units for federal firefighting purposes within their state must be outlined in national, regional, state or local agreements and MOUs between federal agencies and the specific National Guard units.

B. Pilot Informational Needs.

Most Pilot informational needs are provided through use of the Daily Helicopter Operations Briefing/Debriefing Checklist at the start of the operational period and by consulting information posted on the helibase display board.

All Pilots must be briefed on a daily basis. Individual briefings must be provided for Pilots not in attendance at the group briefing (such as those who may have a later start time due to staggered duty days). In addition, all Pilots shall be provided with a copy of the following:

- A current Incident or Project Map marked with hazards, helispots, drop points, dip sites, etc.
- A copy of the Air Operations Summary (ICS-220)
- A copy of the Radio Communications Plan (ICS-205)

It is the Helibase Manager's responsibility to communicate hard-copy needs of the above to the Air Support Group Supervisor, Air Operations Branch Director or Project Aviation Manager.

C. Helibase Manager Kit.

Helibase Managers should bring the items identified in Appendix B to all incidents or projects.

D. Aviation Safety Assistance Teams/Safety and Technical Aviation Team (ASAT/STAT).

A geographic area (State, Area, or Region) may request that the Incident Commander accommodate the visit of an Aviation Safety Assistance Team, or the Incident Commander or Project Aviation Manager may request one.

Teams are usually made up of Helicopter Operations Specialists and Pilot, Maintenance, and Avionics Inspectors.

Teams have been instructed not to interfere with operations unless an immediate safety hazard is observed. The ASAT/STAT should close out with both the Helibase Manager, supervisory air operations staff (ASGS/AOBD), and the Incident Commander or Operations Section Chief, or Project Aviation Manager.

It is advisable that the Helibase Manager consult the Incident/Project Helicopter Operations and Safety Evaluation prior to the Team's arrival. Close adherence and attention to the items in the Daily Checklist and Helibase Manager's Reminders List will usually ensure a positive evaluation. The evaluation team completes the following:

- Reviews the Daily Checklist items, checking for compliance.
- Reviews the Helibase Manager Reminder's List items, checking for compliance.
- Evaluates management relationships to determine if coordination and communication are occurring.
- Determines if training opportunities are being offered.
- Reviews Pilot, maintenance, and avionics inspectors' findings.

CHAPTER 16: LAW ENFORCEMENT OPERATIONS.

I. Introduction.

All direction in this chapter is provided for the purpose of ensuring safety and efficiency in law enforcement aviation operations. It is essential that law enforcement personnel who use helicopters in the conduct of their missions possess thorough knowledge of all aspects of helicopter operations.

Law enforcement aviation operations often have special needs. Some missions are conducted in a higher-than-normal risk environment where the hazards on the ground from potential gunfire and apprehending suspects may be greater than, or compound, the hazards associated with the aviation mission.

> IMPORTANT NOTE: Provisions in the procurement document may prohibit use of vendor helicopters for high-risk law enforcement missions. Vendors and Pilots must be informed of any potential hazard to the aircraft or its occupants.

Though this chapter and agency-specific policy may exempt law enforcement from some standard helicopter operating procedures, it must be emphasized that an exemption in one area does not automatically exempt law enforcement users from following other standard operating practices and procedures. All activities not covered in this chapter and specifically exempted here or in agency-specific policy shall follow the procedures outlined in previous chapters. This chapter is organized according to the structure and chapter sequence of the guide itself for ease of reference.

The leader of each law enforcement mission shall implement the rapid risk assessment and management techniques discussed in Chapter 3.

II. Personnel Duties and Responsibilities, Qualifications, Certification and Training.

All law enforcement aviation operations should be conducted by qualified helicopter managers and crew members in accordance with agency requirements for Resource/Project Helicopter Manager and Resource/Project Crew Member.

III. Operational Planning.

Law enforcement aviation missions may be accomplished using agency-owned, contracted, rented, other-government agency or military helicopters. There are numerous agreements between agencies and the military for using the latter’s aircraft and Pilots.

A. Types of Missions.

Specialized law enforcement aviation operations are often conducted in coordination with other-agency law enforcement personnel and aircraft. They may include:

- Counter-narcotics operations
- Surveillance of suspects or locations
- Warrant service
- Reconnaissance
- Fire Investigation
- Seizure and removal of evidence, contraband, and other property

Operations must emphasize safety requirements and considerations. All law enforcement personnel shall adhere to all agency policy except those personnel involved in operations defined as covert. Special exemptions granted by the agency shall then apply, but only in specific areas defined in the exemption.

When planning law enforcement aviation missions, an Aviation Manager shall be consulted to ensure compliance with guidelines and procedures and to assist in planning safe, effective operations.

B. Rappel and Short-haul Operations.

All rappel and short-haul missions conducted by agency law enforcement personnel shall conform to the procedures outlined in the *Interagency Helicopter Rappel Guide* or the *Helicopter Short-haul Handbook*, whichever is applicable. Rappellers and short-haulers from other agencies and the military must adhere to their agency requirements.

C. Use of the Incident Command System Aviation Structure.

During complex operations, it is advisable to use the Incident Command System aviation structure.

D. Aerial Supervision/Airspace Coordination.

For multiple aircraft operations, it is recommended that an aerial supervisor be assigned (ATGS, HLCO) to perform aerial supervision and airspace coordination duties. This individual can operate from either a fixed-wing aircraft or helicopter. The requirements of Federal Aviation Regulation FAR 91.119 regarding maintaining minimum safe altitudes from persons or property on the ground apply (see *Interagency Airspace Coordination Guide*).

IV. Flight Following, Resource Tracking and Communications.

All procedures in Chapter 4 shall be followed, except for covert operations where the need for secure communications is essential. In those cases, one of the following procedure(s) shall be used:

A. Grid Map Reference.

The flight plan is placed in a sealed envelope to be opened by the flight following Dispatcher only in the event of an aircraft emergency or failure to check in within specified time frames. Flight check-ins are performed using coded grid references rather than geographical location descriptors.

B. Flight Following Through Another Agency.

Flight following may be performed by another agency (for example, Department of Defense, National Guard or sheriff's office). Check-in frequency shall meet the requirements outlined in Chapter 4.

C. Satellite Flight Following.

Flight following via an automated reporting satellite system is highly recommended, since no voice communication is necessary.

V. Personnel and Equipment Approval and Carding.

Aircraft of other federal, state, and local agencies, military components, and private industry cooperators used by law enforcement shall meet aircraft equipment requirements, conditions, and standards comparable to those required of contractors or in-house aircraft, as established by Letter of Agreement (LOA) or MOU.

A. Non-Emergency Operations.

All rented, chartered, contracted or agency-owned aircraft shall be flown by Pilots who meet agency standards and possess a current Interagency Pilot Qualification Card.

Use of other law enforcement agency, Department of Defense, National Guard, or Coast Guard aircraft flown by that agency's Pilot(s) requires acceptance of that agency's Pilot qualifications requirements in an MOU or LOA. In these instances, it is acceptable for agency law enforcement personnel to fly with uncarded Pilots who have been approved under the MOU or LOA.

B. Emergency Operations.

In certain life threatening emergencies and/or covert operations, it may be necessary for law enforcement personnel to deviate from policy. This may include PPE deviations, seating configurations, and riding in unapproved aircraft and/or with unapproved Pilots. These situations usually involve search and rescue or medevac operations being conducted by local authorities using public agency, military, commercial or private aircraft.

It is also recognized that covert law enforcement situations exist where an agency employee can become engaged in an activity, while operating within the normal scope of employment, which precludes using carded and approved aircraft and Pilots. An example would be a law enforcement officer put in a situation, while operating undercover, where they are required to fly in a suspect's aircraft.

Law enforcement employees are authorized to use unapproved aircraft and Pilots during the covert phase of an operation providing such use is, in their judgment, necessary. The following policies shall govern emergency situations:

- Authorization shall be given on a case-by-case basis by the law enforcement officer in charge or Incident Commander (it is recognized that this cannot always be accomplished before the fact).
- A written justification statement shall be prepared by the law enforcement officer in charge and submitted to the appropriate Aviation Manager within 24 hours of the completion of the mission. Submit a SAFECOM report as soon as possible to the unit with operational control.

VI. Helicopter Capabilities and Limitations.

Refer to Chapter 6, especially for guidance regarding flying at night during emergency operations.

VII. Helicopter Load Calculations and Manifests.

See Chapter 7 and Appendix A for requirements and procedures.

- When using aircraft other than military, load calculations and manifests are required, except, subject to the exemption above, when flying undercover in a suspect's helicopter.
- When using military aircraft, use of the PPC is acceptable.

VIII. Helicopter Landing Areas.

Standards outlined in Chapter 8 shall be followed. It is recognized that landing areas may not always be optimal. Nevertheless, particular care should be exercised in selecting landing sites for law enforcement operations.

IX. Equipment Requirements and Maintenance.

Refer to Chapter 9 for standard requirements and procedures.

- Exemptions from agency aviation PPE requirements are agency-specific and shall be used only in emergency situations when the hazards on the ground (for example, from gunfire) are greater than those requiring the use of aviation PPE.
- It is recognized that law enforcement operations may require the use of specialized equipment. In these situations, consult with the local unit Aviation Manager.
- It is essential that a thorough preflight check of the aircraft be made to detect sabotage. Security is addressed later in this chapter in Section XV.

X. Personnel Transport.

See Chapter 10 for standard requirements and procedures. The following specifically applies to law enforcement and should be conducted by law enforcement personnel only.

A. Transport of Injured Officers.

Prior to transporting an officer with serious injuries, all weapons being carried by the injured officer shall be secured by another law enforcement officer.

B. Transport of Canines.

All canines should be either muzzled and restrained or contained in a secured portable carrier with Pilot's concurrence. Canines shall be transported in the rear of the helicopter and accompanied by a handler.

C. Transport of Prisoners.

When prisoners are transported by aircraft, the following guidelines shall be used (not applicable to inmate fire crews).

- Brief the Pilot on the prisoner, the nature of the crimes and the extent of safety precautions used while transporting a prisoner. Brief the prisoner on aircraft safety using the standard briefing format for all passengers.
- Search the prisoner for weapons even if the prisoner has been previously searched.
- Handcuff the prisoner using standard law enforcement policy and procedures. If the prisoner is to be handcuffed in front, ensure that a belly chain or other suitable device is used.

- Seat and restrain prisoners in the rear of the aircraft opposite the Pilot with the law enforcement officer sitting next to the prisoner. It is not advisable to seat a prisoner where the prisoner has access to the Pilot or controls.
- Law enforcement officers at the receiving landing area should be briefed and available for pickup and transportation of the prisoner.

XI. Cargo Transport.

Refer to Chapter 11 for standard requirements and procedures. The following specifically applies to law enforcement operations.

A. Transport of Evidence.

Transportation of evidence should follow agency guidelines and requirements, but must not compromise aviation safety.

B. Hazardous Materials.

With the exception of defensive equipment, all transportation of hazardous materials during law enforcement operations shall follow the procedures of the *Interagency Aviation Transport of Hazardous Materials Handbook/Guide*. Weapon control, readiness for use, and method of transport is the responsibility of the LEO.

1. Transport of weapons. Transportation Security Administration, (TSA) 49 CFR 1544.219 governs LEOs in the transportation of ammunition and compressed gas cylinders contained in weapons, magazines and belt holders. When LEOs transport weapons in the aircraft the following safety precautions shall be taken.
   - Brief Pilot(s) on weapons type(s) and safety policy.
   - Long guns (shotguns, rifles, etc.) shall not have a round in the chamber unless the tactical situation as determined by the LEO dictates, the Pilot in command has been briefed, and all agency guidelines and requirements are followed.
   - Hand guns may be loaded and shall be holstered.
   - Fully automatic weapons shall have an empty chamber and the bolt locked in safe position.
   - Keep all weapons pointed in a safe direction as determined by the Pilot during the preflight briefing.
2. Transport of Pyrotechnic Devices. When law enforcement personnel carry pyrotechnic devices in the aircraft, follow safety procedures in the *Interagency Aviation Transport of Hazardous Materials Handbook/Guide*.

3. Transport of Hazardous Chemicals. When law enforcement personnel carry hazardous chemicals in the aircraft, the following safety precautions shall be taken:

   - Brief Pilot(s) on material and safety policy.
   - All clandestine laboratory paraphernalia shall be transported under the direction of a designated hazardous materials response team.

XII. Fire Protection and Crash rescue.

See Chapter 12 for standard requirements and procedures.

XIII. Fueling Operations.

See Chapter 13 and Appendix I for standard requirements and procedures.

XIV. Helicopter Maintenance.

See Chapter 14 for standard requirements and procedures.

- Maintenance requirements for use of cooperator or military aircraft should be established by LOA or MOU.
- It is essential that a thorough preflight check of the aircraft be made to detect sabotage.

XV. Helibase and Helispot Management and Operations.

See Chapter 15 and Appendix F for standard requirements and procedures.

A. Law Enforcement Helibase.

Law enforcement shall be at the helibase at all times. If a Helicopter Manager or Helibase Manager is a qualified LEO, he or she can act in this capacity.

B. Law Enforcement Helispots.

Law enforcement must be with the aircraft at all times while it is on site. At no time shall the helicopter shut down without an LEO present.

C. Overnight Security.

Unless set forth in the contract, agency law enforcement is not legally responsible for overnight security of the aircraft at an airport or other secured area. At other sites, however, it may be highly prudent for the agency to provide security.

D. Fuel Truck.

Fuel trucks shall be escorted through high risk areas by an LEO. Overnight security shall be under the same guidelines as the aircraft.

XVI. Administration.

- Appendix D provides guidance on helicopter administration, including Contracting Officer, Contracting Officer's Representative, and Project Inspector duties and responsibilities; completion of flight payment documents; etc.
- Agencies may have specific guidelines for reporting non-revenue use of cooperator and military helicopters.

CHAPTER 17: SEARCH AND RESCUE OPERATIONS.

I. Introduction.

The use of aviation assets for search and rescue operations can be highly effective. All direction in this chapter is intended for the purpose of promoting the safety and efficiency in search and rescue aviation operations.

All activities not covered in this chapter shall follow the procedures outlined in other parts of this guide, as well as other appropriate agency manuals and handbooks. Due to the high-risk nature of search and rescue missions, it is critical that search and rescue personnel possess thorough knowledge of all aspects of helicopter operations.

The leader of each helicopter search and rescue mission shall implement the rapid risk assessment and management techniques discussed in Chapter 3.

CAUTION: It is very easy to become caught up in the urgency of a search and rescue mission, especially those involving life threatening situations. Regardless of the emergency, never forget to follow basic helicopter procedures.

II. Personnel Duties and Responsibilities, Qualifications, Certification and Training.

All search and rescue aviation operations should be conducted by qualified helicopter managers and crew members in accordance with agency requirements for Resource/Project Helicopter Manager and Resource/Project Crew Member.

III. Operational Planning.

A. Types of Missions.

Types of specialized search and rescue flight environments and missions may include:

- Reconnaissance
- Low-level flight
- Hovering Out of Ground Effect
- Short-Haul
- Rappel
- Cargo Letdown
- Support to other agencies

These types of operations must emphasize safety requirements and considerations. When planning aviation missions, an Aviation Manager must be consulted to ensure compliance with guidelines and procedures and to assist in safe, effective operations.

B. Rappel and Short-haul Operations.

The use of rappel or short-haul requires agency approval, training and qualifications in accordance with the current edition of the *Interagency Helicopter Rappel Guide* or the *Helicopter Short-haul Handbook.*

C. Use of the Incident Command System Aviation Structure.

During complex operations, it is advisable to use the Incident Command System aviation structure.

D. Aerial Supervision and Airspace Coordination.

For operations using multiple aircraft, it is recommended that an aerial supervisor be assigned (ATGS, HLCO) to perform aerial supervision and airspace coordination duties. This individual can operate from either a fixed-wing aircraft or helicopter. The requirements of Federal Aviation Regulation FAR 91.119 regarding maintaining minimum safe altitudes from persons or property on the ground apply (see *Interagency Airspace Coordination Guide*).

IV. Communications and Flight Following.

All procedures in Chapter 4 shall be followed.

V. Personnel and Equipment Approval and Carding.

Aircraft of other federal, state and local agencies, military components, and private industry cooperators used by search and rescue entities that are not currently under contract or agreement should only be used until approved aircraft and Pilots can be obtained.

> NOTE: The agency involved in the search and rescue operation may have a LOA or MOU that allows use of other-agency or military aircraft that contains standards for Pilot and equipment approval.

A. Emergency Operations.

In certain life threatening emergencies it may be necessary for personnel to deviate from policy. This may include PPE deviations, seating configurations and riding in unapproved aircraft and/or with unapproved Pilots. These situations usually involve search and rescue or medevac operations being conducted by local authorities using public agency, military, commercial or private aircraft.

> CAUTION: Don't become part of the emergency! Choose an aircraft capable of meeting performance requirements for the mission.

The following policies shall govern emergency situations:

- Authorization will be given on a case-by-case basis by the responsible employee in charge or Incident Commander (it is recognized that this cannot always be accomplished before the fact).
- A written justification shall be prepared by the employee and attached to A SAFECOM report, and submitted to the appropriate Aviation Manager within 24 hours of the completion of the mission.

B. Non-Emergency Operations.

All rental, charter, contracted or agency owned aircraft shall be flown by Pilots who meet agency standards and possess a current Interagency Pilot Qualifications Card.

VI. Helicopter Capabilities and Limitations.

Refer to Chapter 6, especially for guidance regarding flying at night during emergency operations.

VII. Helicopter Load Calculations and Manifests.

See Chapter 7 and Appendix A for requirements and procedures.

- When using aircraft other than military, load calculations and manifests are required.
- When using military aircraft, use of the PPC is acceptable.

VIII. Helicopter Landing Areas.

Standards outlined in Chapter 8 shall be followed. It is recognized that in emergency situations landing areas may not always be optimal. Nevertheless, particular care should be exercised in selecting landing sites for search and rescue operations.

IX. Equipment Requirements and Maintenance.

Refer to Chapter 9 for standard requirements and procedures.

- Exemptions from aviation PPE requirements are agency-specific and shall be used only in emergency situations. These generally apply to the use of alternative PPE for extreme environmental conditions.

- It is recognized that search and rescue operations may require the use of specialized equipment. In these situations, consult with the local unit Aviation Manager.
- High-visibility flight suits for dedicated search and rescue personnel are highly recommended (Pilots can readily locate personnel on the ground).

X. Personnel Transport.

See Chapter 10 for general requirements and procedures. It is recognized that during emergency search and rescue operations all requirements may not be met. Nevertheless, care must be exercised to prevent additional injury and/or loss of life. If possible, the Helicopter Manager should be on board the helicopter to assist with aircraft management.

Depending on the situation, the following procedures should be used.

A. Medical Transport of Patients.

- Secure oxygen tanks.
- Carry medical gloves for protection from patient body fluids and blood-borne pathogens. Proper body substance precautions should be used in transport of the deceased.
- Secure the patient to the litter and then secure the litter to the helicopter.
- If injuries would be aggravated by use of personal protective equipment then PPE requirements are exempt.

B. Transport of Canines.

All canines should be either muzzled and restrained or contained in a secured portable carrier with Pilot's concurrence. Canines shall be transported in the rear of the helicopter and accompanied by a handler.

XI. Cargo Transport.

Refer to Chapter 11 for standard requirements and procedures.

XII. Fire Protection and Crash rescue.

See Chapter 12 for standard requirements and procedures.

XIII. Fueling Operations.

See Chapter 13 and Appendix I for standard requirements and procedures.

XIV. Helicopter Maintenance.

See Chapter 14 for standard requirements and procedures. Maintenance requirements for use of cooperator or military aircraft should be established by LOA or MOU.

XV. Helibase and Helispot Management and Operations.

See Chapter 15 and Appendix F for standard requirements and procedures.

XVI. Administration.

- Appendix D provides guidance on helicopter administration, including contracting officer, contracting officer's representative and project inspector duties and responsibilities; completion of flight payment documents; etc.
- Agencies may have specific guidelines for reporting non-revenue use of cooperator and military helicopters.

APPENDIX A: HELICOPTER MANAGEMENT FORMS AND CHECKLISTS

I. Introduction.

This appendix provides standardized forms for the management and operation of a single helicopter. Such standardization helps to implement common procedures among participating agencies to meet mutual safety, efficiency, fiscal management, and contract administration objectives. The forms also provide a basis for training development and presentation.

II. Applicability.

The forms in this appendix are to be used by Helicopter Managers, whereas those in Appendix B and Appendix C are to be used in the management of helibases.

However, several of the Helicopter Management (HCM-series) forms contribute to the informational requirements of the Helibase Management (HBM-series) forms. It is therefore essential that Helicopter Managers use these forms as appropriate or required when operating as part of a helibase organization.

Some of the forms are required for all helicopter operations; some are required only for incident operations. Others are optional and may be used at the discretion of the Helicopter Manager or local aviation management staff as part of the unit's helicopter operation. Certain optional forms may be required by the air operations staff at an incident or project due to a specific management informational need.

The use and applicability of other contracting forms such as Contract Instruction, Notice to Proceed, etc., are discussed in agency contract administration guides.

Chart A-1 on the following pages is a summary listing of the HCM-series forms, including information concerning the purpose of the form, the HCM test form number, whether a form is optional or required for all or only certain situations, responsibility for completion, and frequency of completion. The Helicopter Manager may use this chart as a quick-reference guide to form requirements. The pages following the chart contain a comprehensive discussion of each form.

Helicopter Managers, both exclusive use and Call-When-Needed (CWN), should obtain sets of all forms so that they may respond to different management requirements encountered. Recognizing that at most incidents, or prior to a project's start that copies may be reproduced, Chapter 9 provides recommendations concerning the number of forms to carry in the Helicopter Manager's Kit.

The HCM forms are available as part of the IHOG forms supplement package at http://www.nifc.gov/aviation/av_ref_ihog.html.

Form Name	Purpose	IHOG Form # Required or Optional	Individual Responsible for Completion	Frequency	Remarks
Aircraft Contract Daily Diary	To provide daily documentation of contract activities, significant occurrences, deficiencies, actions by the contractor or government, etc.	HCM-1 Required for all contracts	Helicopter Manager	Daily	Actions, discrepancies, etc. Should be documented as they occur
Call When Needed (CWN) Pre-use Checklist	To ensure the helicopter and service truck meet requirements and specifications contained in the procurement document.	HCM-2 Required for CWN or ARA aircraft	Helicopter Manager	Once prior to use of aircraft	Discrepancies should be reported to the Contracting Officer and appropriate Aviation Manager. Do not use the aircraft or service truck until discrepancies are corrected and approval is received.
Aircraft Fuel Facility Inspection Log	To provide an inspection format for aircraft fuel facilities.	HCM-3 Required for government fuel facilities	Helicopter Manager or local Aviation Manager	According to local or agency policy	All government owned facilities and contractor owned facilities as specified in the procurement document.
Helicopter Turbine Engine Power Check	To gather engine performance data which when graphed, may indicate power fluctuations that may lead to engine failure.	HCM-4 Optional - see remarks	Pilot or Helicopter Manager	According to procurement	Data may be graphed on HCM-5. Information must be recorded. Other formats are acceptable.
Helicopter Engine Performance Trend Analysis	To graph information recorded from HCM-4.	HCM-5 Optional - see remarks	Pilot or Helicopter Manager	According to procurement	This information must be trended in some manner. This form is not the only method to accomplish this.
Helicopter Information Sheet	To provide air operations personnel with information regarding the pilot, ground crew and aircraft.	HCM-6 Required for large fire, may be optional for project	Helicopter Manager	Immediately after arrival at incident or project helibase	Form should be completed before leaving home unit for Exclusive Use Aircraft or at the beginning of CWN use, and presented to Helibase Manager on arrival at incident.
Helicopter Crew Information Sheet	To provide air operations personnel with information regarding assigned crew and qualifications.	HCM-7 Required	Helicopter Manager	Immediately after arrival at incident or project helibase	Form should be completed before leaving home unit for Exclusive Use aircraft or at the beginning of CWN use, and presented to Helibase Manager on arrival at incident.

Form Name	Purpose	IHOG Form # Required or Optional	Individual Responsible for Completion	Frequency	Remarks
Interagency Helicopter Load Calculation	To ensure helicopter is capable of carrying a specified load to an identified elevation at a given density altitude.	HCM-8 OAS-67 FS 5700-17 911-03) or state or local agency format	Pilot and Helicopter Manager	Daily and prior to flight	Complete a new calculation with changes in temperature, altitude, etc. Post appropriately.
Interagency Helicopter Passenger/Cargo Manifest	To allow the helicopter manager to track passengers and weights.	HCM-9 *Optional	Helicopter Manager	Prior to each flight	A manifest must be completed for each flight. Other formats are acceptable.
Helicopter Load Capability Summary	To allow the Helicopter manager to plan missions safely and efficiently to different elevations and temperatures at varying fuel loads.	HCM-10 Optional	Helicopter Manager	On incidents or projects	Must be based on completed load calculations for all temperatures and elevations shown.
Aircraft Dispatch Form	To provide Helicopter Manager and Pilot with information that may be critical to flight safety.	HCM-11 NIFC 9400-31 NFES 2657 Optional	Helicopter Manager or Aircraft Dispatcher	Prior to dispatch of aircraft	Used upon dispatch to an incident.
Pilot Flight Time/Duty Day Cumulative Log	To track pilot duty and flight time to ensure specification are not exceeded	HCM-12 Required	Helicopter Manager	Daily	Required for all pilots.
Fuel Servicing Driver Duty Day Cumulative Log	To track driver duty time and days off to ensure specifications are not exceeded.	HCM-13 Optional	Helicopter Manager	Daily	This form is used to keep track of extended standby time and days off only. The driver is responsible for tracking DOT duty time.
Mechanic Duty Day Cumulative Log	To track mechanic duty time and days off to ensure specifications are not exceeded.	HCM-14 Required	Helicopter Manager	Daily	This form is used to keep track of extended standby time and days off only.
Helicopter Daily Use and Cost Summary	Summarizes helicopter use and costs for each helicopter on an incident or project.	HCM-15 Required for Type 1 and 2 incidents	Helicopter Manager	Daily	Must be completed a the end of the operational period.
CWN Helicopter Contractor Performance Evaluation	To enable Helicopter Manager to evaluate the contractor on performance.	Reference Contract	Helicopter Manager	At the end of each assignment	Send a copy is to the Contracting Officer at the end of each assignment.

III. Helicopter Management (HCM) Forms.

A. Aircraft Contract Daily Diary (HCM-1).

1. Purpose. The purpose is to provide daily documentation of contract activities.
2. Applicability. The form is required for all exclusive-use contract helicopters, both fire and project, as well as fire CWN. Its use is also encouraged for rental helicopters utilized for more than one day.
3. Responsibility and Instructions for Completion. See Exhibit A-1. It is the responsibility of the Helicopter Manager to complete the form on a daily basis. The Helicopter Manager should document significant occurrences, deficiencies, actions by the contractor or government, etc.

   If nothing of significance occurred, an entry indicating such should be made. Higher levels in the contract administration structure (for example, the Contracting Officer's Representative) are encouraged to utilize a continuous documentation log rather than the single-sheet format shown here.

   Completion is self-explanatory. Refer to Appendix D, Contract Administration and Agency Flight Payment Documents, for further information.

4. Routing and Filing. Routing and filing is indicated at the bottom of the form and is as follows:

   - White - Project Inspector (PI in USDI) or Contracting Officer's Representative (COR in USFS)
   - Yellow - Contracting Officer
   - Pink - Local Air Officer (USFS), State/Regional/Area Air Officer (USDI), or as identified by state/local agencies

   Copies should be routed to appropriate personnel concurrently with copies of agency flight payment documents.

5. Posting. None.
6. Related Forms. Form HCM-2, Call When Needed Pre-Use Checklist, is the start of contract documentation for CWN helicopters.

   Certain occurrences that are documented on the Aircraft Contract Daily Diary may require submission of an agency incident/hazard report.

Exhibit A-1: Form HCM-1 Aircraft Contract Daily Diary

Contract #:	Item:	Page		Of		Date:
1. Contractor:		7. Designated Base:				
2. A/C Make/Model & FAA #:		8. Current Aircraft Location:				
3. Pilot(s) On Duty:		**9. Activity:** Ferry		Training	Project	
		Large Fire Support		Standby	IA	
4. Mechanic(s) On Duty:		10. Other Aircraft On Base:				
5. Driver(s) On Duty:		11. Weather:				
6. Total # Of Contractor Personnel:		12. Local Fuel Price:				

13. Pay Items	Begin	End	Total	EXT.	14. Special Equipment	HR/Days	Cost
Availability							
Flight Time							
Service Miles							
Pilot Duty							
Driver Duty							
Mechanic Duty							

15. Aircraft Status: (Maintenance performed, power trend analysis completed, reasons for any unavailability, etc.)

16. Narrative Report: (Include problems encountered, official visits or inspections, safety issues encountered, etc.)

17. Miscellaneous Costs: (Contractor purchased permits, fees, travel, etc; to be reimbursed by Govt.)

18. Govt. Representative Name/ Title (Print):	Govt. Representative Signature:	Date:

B. Helicopter and Service Truck Pre-Use Checklist (HCM-2).

1. Purpose. The purpose is to ensure fire CWN or fire rental helicopters meet requirements and specifications as contained in the procurement document.

2. Applicability. The form is required to be completed for all fire CWN or fire rental helicopters prior to use. It may also be utilized for project rental helicopters as a checklist to document the condition of the helicopter. However, not all of the items indicated as required for fire are required for projects.

3. Responsibility and Instructions For Completion. See Exhibit A-2. Pre-use inspections should be accomplished prior to arrival of the helicopter at the incident by either the Helicopter Manager, an agency aircraft inspector, or other authorized aviation management personnel.

   The Helicopter Manager is responsible for either ensuring the inspection has been completed (ask for signed copy from vendor), or completing the checklist prior to the utilization of the helicopter.

   Discrepancies must be reported immediately to the aircraft contracting organization, as well as to the State, Area, or Regional Aviation Officer or his/her representative. Do not use the aircraft until discrepancies have been rectified and/or permission is given to utilize the aircraft.

   Completion is self-explanatory.

4. Routing and Filing. The Helicopter Manager should keep the completed form unless requested to route it differently

5. Posting. None.

6. Related Forms. Form HCM-1, Aircraft Contract Daily Diary, should be initiated simultaneously with the Call When Needed Pre-Use Checklist.

   Discrepancies should be noted on the Daily Diary.

Exhibit A-2: Form HCM-2 Helicopter and Service Truck Pre-Use Checklist

General							
Date:	Aircraft Make/Model:				N#:		
Vendor:					Equipped Weight:		
Pilot(s) Name(s):				Mechanics Name:			
Card Expiration Date(s):				Card Expiration Date:			
Pilot(s) Carded for Intended Mission(s):	Yes:		No:		Yes:		No:
A/C Card Expiration Date:		A/C Carded For Intended Mission(s):			Yes:		No:
Departure Base:		Departure HOBBS:			Arrival HOBBS:		
Copy Of Contract Onboard A/C:	Yes:	No:	HazMat HB/Exemption/ERG:		Yes:		No:

Logbook Review				
50/100-Hour, Progressive, Or Other Inspection Program Up-To-Date:	Yes:		No:	
Entries Indicating Damage to Aircraft:	Yes:		No:	
Form HCM-5 "Turbine Engine Performance Trend Analysis" Onboard Aircraft:	Yes:		No:	
Power Check Completed/Results Satisfactory:	Yes:		No:	
Comments:				

Condition Of Helicopter

Item	OK	Document Inoperable Or Damaged Equipment (Dents, Tears, Leaks, Etc.)
Skin and Exterior		
Windows		
Doors		
Upholstery		
Cargo Compartment		
Skids/Wheels		
Fixed Tank		
Other		
Comments:		

Required Helicopter Equipment Installed And Operative (Consult Contract)

Item	Yes	No	Item	Yes	No
Seat Belts And Harnesses			Strobe Light(s)		
Hi-Visibility Paint On Main Rotor Blades			Survival Kit		
Required FM Radio(s)			First Aid Kit		
Required AM Radio(s)			Fire Extinguisher(s)		
Auxiliary Radio Adapter			Cargo Hook		
GPS			Convex Mirror		
High Skid Gear			Buckets (Appropriate Sizes)		
Nine-Pin Plug (Type III Helicopters Only)			Anti-Theft Security Measures in Place		
Comments:					

Required Service Truck Equipment Installed And Operative (Consult Contract)

Item	Yes	No	Item	Yes	No
Spare Set Of Filters			Filter Change Date Placarded		
Fire Extinguisher(s)/Current Inspection			Bonding Cables		
HazMat Marking And Placards			Fuel Quality Control Log		
Inspection Sticker			Absorbent Materials For Spills		
Beginning Odometer Reading:					
Comments:					

Signatures of: Inspecting Govt. Representative & Pilot	Print Name	Date

C. Aircraft Fuel Facility Inspection Log (HCM-3).

1. Purpose. The purpose is to provide an inspection format for aircraft fuel facilities to ensure that fuel quality is maintained and fuel spills do not occur.

2. Applicability. The information on this form is required for all fixed or mobile helicopter fueling facilities operated by the government, or for fixed facilities operated by a vendor and that are located on government land.

3. Responsibility and Instructions for Completion. See Exhibit A-3. The vendor is responsible for inspecting vendor-owned facilities located on government land, or government-owned facilities for which the vendor is contractually responsible (for example, the vendor is required to maintain and fill a remote fuel cache).

   The government shall ensure that inspections are performed with the frequency indicated.

   A government representative (for example, the Helicopter Manager or local unit Aviation Manager) is responsible for inspecting Government-owned facilities.

   Items are checked according to the frequency indicated. Refer to Chapter 13, Fueling Operations, for further information.

   Remote facilities for which the required frequency of inspection (for example, daily or weekly checklist items) is not feasible must be fully inspected prior to the use of fuel in the facility.

4. Routing and Filing. For facilities for which the vendor is responsible, the vendor shall provide the government representative (for example, the Helicopter Manager or Project Inspector) with a copy of each monthly inspection. A copy shall be furnished to the Contracting Officer’s Representative (COR) in federal agencies, and to an appropriate individual as identified by state and local agencies.

   For facilities for which the government is responsible, the contract Project Inspector shall furnish a copy of each monthly inspection to aviation management personnel as identified by the agency.

5. Posting. None.

6. Related Forms. Any discrepancies regarding facilities for which the vendor is responsible should be noted on Form HCM-1, Aircraft Contract Daily Diary. The Helicopter Manager should file an agency incident/hazard report concerning any fuel cache discrepancies, regardless of who has the responsibility for maintaining the site. For fuel spills at the site, other local, state, and federal reporting regulations apply.

Exhibit A-3: Form HCM-3 Aircraft Fuel Facility Inspection Log

Facility: **Grade Fuel:** **Month:**

Use only for government operated sites, or vendor sites located on government lands. The inspector must note in each block either PASS or FAIL. For remote sites which are not used or cannot be inspected with the frequency indicated, perform a complete inspection at least monthly or at the time the facility is next utilized, whichever is sooner. Document and report discrepancies on an agency incident/hazard report.

Date	Contamination (water, particles)	Diff. Pressure	Leaks	Hoses Nozzles Screens	Strainers	Fire Extinguishers	Fuel Flow Rate	Pumps Motors Valves	Bond/ Ground	Inspector Initials
	DAILY	DAILY	DAILY	DAILY	DAILY	WEEKLY	WEEKLY	MONTHLY	MONTHLY	
1										
2										
3										
4										
5										
6										
7										
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D. Helicopter Turbine Engine Power Assurance Check (HCM-4).

1. Purpose. The purpose is to gather engine performance data which, when graphed with subsequent power checks, may indicate power fluctuations that potentially could lead to engine failure.

2. Applicability. This form is optional. The vendor or agency Pilot is required to complete the power assurance check every 10 hours of flight for all fire exclusive-use and fire CWN helicopters and for project exclusive-use contracts. A power assurance check shall be accomplished on the first day of operation, and thereafter within each 10-hour interval of contracted flight operation unless prohibited by environmental conditions (i.e. weather, smoke). The power assurance check shall be accomplished by the contractor in accordance with the Rotorcraft Flight Manual or approved company performance monitoring program. The results shall be recorded and kept in the helicopter or at the Assigned Work Location. A current record of the power assurance checks will be maintained with the aircraft. Helicopters with power output below the minimum published performance charts shall be removed from service. The below-minimum power condition shall be corrected before return to service and contract availability."

3. Responsibility and Instructions for Completion. See Exhibit A-4. The Pilot is responsible for completing the form and furnishing a copy to the Helicopter Manager.

   Since power check procedures differ according to make and model of aircraft, refer to the Flight Manual and record appropriate readings according to procedures specified.

   Chart definitions are as follows:

   PA = Pressure Altitude
   O.A.T = Outside Air Temperature
   N1 = Gas Producer Speed
   N2 = Engine RPM
   T.O.T. = Turbine Outlet Temperature
   T.P.T. = Tail Pipe Temperature
   I.T.T. = Inter Turbine Temperature
   Type of Check = Hover
   Performance Reading = TOT/ITT values and/or % of RPM from aircraft instruments
   Chart Reading = TOT/ITT values and/or % of RPM from performance chart
   Margin Difference = Difference between the aircraft performance and chart values

   Results of the chart reading will be recorded and retained according to the contract requirements.

4. Routing and Filing. The Pilot furnishes the Helicopter Manager with a copy of the Power Trend Analysis; it becomes part of the Contract File.

5. Posting. None.

6. Related Forms. Information may be transferred to Form HCM-5, Helicopter Turbine Engine Performance Analysis Chart. The Helicopter Manager should document discrepancies on the agency incident/hazard report and on Form HCM-1, Aircraft Contract Daily Diary.

Exhibit A-4: Form HCM-4 Helicopter Turbine Engine Power Assurance Check

Date:	Aircraft Make/Model:	N#:
Pilot:	Vendor:	
Engine Number:	HOBBS Meter:	

*Item	Value	Type of Check:
OAT:		
PA:		
Torque:		Performance Reading:
Temp:		
N1/NG:		
N2:		Chart Reading:
		Margin Difference:
Correction Factor:		

*Use only items applicable to type of helicopter

HCM-4 (01/05)

E. Helicopter Turbine Engine Power Trend Analysis Chart (HCM-5).

1. Purpose. The purpose is to graph the data collected every 10 hours from Form HCM-4, Helicopter Turbine Engine Power Check. When graphed with subsequent power checks, power fluctuations that might lead to engine failure may be indicated.

2. Applicability. This form is optional. The Information on this form is required to be maintained in accordance with the procurement document.

3. Responsibility and Instructions for Completion. See Exhibit A-5. The Pilot is responsible for graphing the data.

4. Routing and Filing. None.

5. Posting. The graph should be posted at the permanent helibase and taken with the service truck (not the helicopter) on off-unit incidents or projects.

6. Related Forms. Form HCM-4, Helicopter Turbine Engine Power Assurance Check, is utilized to record values for input to the Trend Analysis.

The Helicopter Manager should document discrepancies on the agency incident/ hazard report and note them on Form HCM-1, Aircraft Contract Daily Diary.

Exhibit A-5: Form HCM-5 Turbine Engine Performance Analysis Chart

HCM-5 (01/05) *OPTIONAL

TURBINE ENGINE PERFORMANCE TREND ANALYSIS

Helicopter FAA # :

Make/Model:

Engine # :

Min Spec

Date:
HOBBS:
OAT:
PA:
Torque:
Temp:
N1/NG:
N2:
Pilot Initials:

F. Helicopter Information Sheet (HCM-6)

1. Purpose. The purpose is to provide the Helibase Manager and other operations branch personnel with information concerning the helicopter, the Pilot, and the vendor's ground crew (driver/mechanic) assigned to multiple-aircraft helibases.

   It summarizes most, if not all information relating to each individual helicopter operation at a helibase, thus relieving the Helibase Manager from having to obtain this information at various times over the course of the incident or project.

2. Applicability. The information on this form is required for large fire operations and projects.

3. Responsibility and Instructions for Completion. See Exhibit A-6. Individual blocks on the form are self-explanatory.

   The Helicopter Manager for both exclusive-use contracts and CWN is responsible for completing the form prior to or immediately after arrival at an incident or project helibase.

   The Helibase Manager is responsible for obtaining the Information Sheet immediately upon arrival of a helicopter at an incident or project.

   a. Exclusive-Use Helicopters. All information available at the start of the season should be entered, and multiple copies made for distribution upon arrival at an incident or project. Information concerning Incident/Project Order Number, Aircraft Request Number, and Maintenance And Vendor Crew Information should be completed upon arrival at an incident or project.

   b. Call-When-Needed Helicopters. All information should be completed when the CWN crew assembles and joins up with the helicopter.

4. Routing and Filing. The form is submitted to the Helibase Manager upon arrival at an incident or project. The Air Support Group Supervisor or Air Operations Branch Director is responsible for routing an informational copy to the Resources Unit Leader.

5. Posting. None.

6. Related Forms. Form HCM-7, Helicopter Crew Information Sheet, should be submitted concurrently. Information from the Helicopter Information Sheet is used to complete Form HBM-3, Helibase Aircraft Information Summary. See Appendix B.

Exhibit A-6: Form HCM-6 Helicopter Information Sheet

Date:	Incident/Project Order #:	Request #:	Make/Model:	N #:
		A-		

Check One:		Check One:		
Exclusive-Use Contract	☐	Type 1 Helicopter	☐	Color of A/C:
Call-When-Needed	☐	Type 2 Helicopter	☐	
Agency-Owned	☐	Type 3 Helicopter	☐	Insured PAX Seats:
Other (List)	☐	Limited/Restricted:	YES ☐ NO ☐	

Agency and Home Unit:	Phone # :
COR Name:	Phone # :
CO Name:	Phone # :
Vendor Name/Contact:	Phone # :

Type Bucket/Fixed Tank	Capacity	Foam Injection	Specific Capabilities
		YES ☐ NO ☐	Longline/Remote Hook? YES ☐ NO ☐
		YES ☐ NO ☐	Carousel? YES ☐ NO ☐
Other Capabilities, Avionics, ETC:			Cargo Letdown? YES ☐ NO ☐
			Rappel? YES ☐ NO ☐
			Short-Haul Rescue? YES ☐ NO ☐
			Internal Litter Capable? YES ☐ NO ☐
			Aerial Ignition - PSD? YES ☐ NO ☐
			Aerial Ignition - Helitorch? YES ☐ NO ☐

Vendor Fuel Servicing Vehicle	Government Helitender (Crew Chase Truck)	
Make/Model:	Make/Model:	4X4? YES ☐ NO ☐
License # and State:	License # and State:	Trailer? YES ☐ NO ☐
Tank Capacity:	Number of Seats:	Other:

Hourly Flight Rate:	Daily Availability Rate:	Daily Flight Hours Guarantee:	# of Vendor Personnel:

Maintenance and Vendor Crew Information

Current HOBBS:		Next Scheduled Maintenance Due at:	
Name	**Position (Pilot/Mechanic/Driver)**	**Next Day Off**	**Date Relief Due In**
Vendor Personnel Lodging Site:		Phone Number:	
Vendor Personnel Contact Name:		Phone Number:	
GOV Helicopter Manager Name:		Phone Number:	

Remarks

HCM-6 (01/05) REQUIRED

G. Helicopter Crew Information Sheet (HCM-7).

1. Purpose. The purpose is to provide the Helibase Manager and other air operations branch personnel with information concerning helicopter crews assigned to helicopters at incident or project helibases. It identifies order numbers for CWN crews, qualifications, training needs, days off, etc.

   It relieves the Helibase Manager from having to obtain this information at various times over the course of the incident or project. It is especially valuable for filling helibase positions and training assignments.

2. Applicability. The information on this form is required for large fire operations and projects.

3. Responsibility and Instructions for Completion. See Exhibit A-7. Individual blocks on the form are self-explanatory.

   The Helicopter Manager for both exclusive-use contracts and CWN is responsible for completing the form prior to or immediately after arrival at an incident or project helibase.

   The Helibase Manager is responsible for obtaining the Information Sheet immediately upon arrival of a helicopter at an incident or project.

   a. Exclusive-Use Helicopters. All information available at the start of the season should be entered, and multiple copies made for distribution upon arrival at an incident or project. Information concerning Incident/Project Order Number, Aircraft Request Number and Last Day(s) Off is to be completed upon arrival at an incident or project.

   b. Call-When-Needed Helicopters. All information should be completed when the CWN crew assembles and joins up with the helicopter.

4. Routing and Filing. The form is submitted to the Helibase Manager upon arrival at an incident or project. The Air Support Group Supervisor or Air Operations Branch Director is responsible for routing an informational copy to the Resources Unit Leader.

5. Posting. None.

6. Related Forms. Form HCM-6, Helicopter Information Sheet, should be submitted concurrently. Information from the Helicopter Crew Information Sheet is used to complete Form HBM-1, Helibase Organization Chart, ensuring that only qualified individuals fill helibase positions.

Exhibit A-7: Form HCM-7 Helicopter Crew Information Sheet

HELICOPTER CREW INFORMATION SHEET

AIRCRAFT INCIDENT/PROJECT ORDER # : ____________________ **AIRCRAFT REQUEST # :** __________

CREW NAME or RESOURCE ID # : ______________________________

TYPE of CREW:

☐ ATTACHED TO CONTRACT HELICOPTER (Enter Aircraft "A" Order/Request and Personnel Subordinate/Roster # (i.e. A-1.1) in the column next to each individual's name

☐ ATTACHED TO CWN HELICOPTER (Enter Overhead "O" Order/Request # in the column next to each Individual's name

Name	Order/ Request #	Travel Method	Return to (City)	Last Day Off	1st Day On Assignment	Qualifications/Special Skills	Training Needs
Helicopter Manager							
Assistant Manager							
Lead Crewperson							
Crewperson							
Crewperson							
Crewperson							
Crewperson							
Crewperson							

HCM-7 (01/05) REQUIRED

H. Helicopter Load Calculation (HCM-8).

1. Purpose. The purpose is to ensure that the aircraft is capable of carrying a specified load to an identified elevation at a given density altitude.

2. Applicability. This form is required to be completed daily for all helicopter flights prior to the start of operations. A minimum of one calculation must be made, with subsequent loads manifested. Additional calculations are required as conditions change (See Chapter 7, Section III, B).

   Form HCM-10, Helicopter Load Capability Summary Multiple helispots and fuel loads may be used to summarize load calculation information and plan flights. However, data for altitudes, temperatures, and fuel weights indicated must be supported by load calculations completed from the appropriate chart(s).

3. Responsibility and Instructions for Completion. See Exhibits A-7 and A-8. Refer to Chapter 7 for further information.

   - For USDI agencies, the Pilot is required to complete Blocks 1-15. For USFS, the Pilot is required to complete Blocks 1-15.
   - The Pilot must utilize the applicable charts in the aircraft flight manual, referencing them each time a load calculation is initiated. The Helicopter Manager is responsible for ensuring that the Pilot does this.
   - The Pilot signs after the Helicopter Manager has completed the remainder of the form.
   - One copy is always left on the ground at takeoff site, or, if no one is at the takeoff site, the flight following facility must be informed of personnel on board (the form must still be completed).

   Specific instructions for completion of the USDI and USFS versions of the load calculation follow. Other state and local agencies should reference agency guidance.

4. Routing and Filing.

   - Fire. At the termination of fire assignments, the Helicopter Manager is responsible for submitting copies of all load calculations, with copies of manifests attached, to the Helibase Manager. These copies become part of the incident file.
   - Project. At the termination of project missions, the Helicopter Manager is responsible for submitting all load calculations, with manifests attached, to the predetermined agency Aviation Manager or designee (for example, the Dispatcher). That individual includes the load calculation(s) as part of the flight file.

5. Posting. At incident helibases, load calculations for each helicopter for a variety of altitudes and temperatures shall be posted on the display board. A standard fuel load for similar makes/models helicopters should be utilized.

6. Related Forms. Form HCM-9, Interagency Helicopter Passenger/Cargo Manifest, is used to document manifest information under one “umbrella” load calculation.

Form HCM-10, Helicopter Load Capability Summary Multiple Helispots and Multiple Fuel Loads, may be used to summarize load calculation information. Form HBM-4, Allowable Payload Chart, and HBM-5, Load Capability Planning Summary (By Single Helispot), are completed from individual load calculations. Load calculation, manifest, and flight time information is summarized on Form HCM-15, Helicopter Daily Use And Cost Summary, and is utilized to complete the agency flight payment document.

INSTRUCTIONS

A load calculation must be completed for all flights. A new calculation is required when operating conditions change (± 1000' in elevation or ± 5°C in temperature) or when the Helicopter Operating Weight changes (such as changes to the Equipped Weight, changes in flight crew weight or a change in fuel load).

All blocks must be completed. Pilot must complete all header information and Items 1-13. Helicopter Manager completes Items 14 & 15.

1. DEPARTURE – Name of departure location and current Pressure Altitude (PA, read altimeter when set to 29.92) and Outside Air Temperature (OAT, in Celsius) at departure location.
2. DESTINATION – Name of destination location and PA & OAT at destination. If destination conditions are unknown, use MSL elevation from a map and Standard Lapse Rate of 2° C/1000' to estimate OAT.
3. HELICOPTER EQUIPPED WEIGHT – Equipped Weight equals the Empty Weight (as listed in the Weight and Balance Data) plus the weight of lubricants and onboard equipment required by contract (i.e. survival kit, rappel bracket).
4. FLIGHT CREW WEIGHT – Weight of the Pilot and any other assigned flight crew members on board (i.e. Co-pilot, flight engineer, navigator) plus the weight of their personal gear.
5. FUEL WEIGHT – Number of gallons onboard X the weight per gallon (Jet Fuel = 7.0 lbs/gal; AVGAS = 6.0 lbs/gal).
6. OPERATING WEIGHT – Add items 3, 4 and 5.

7a. 7a. PERFORMANCE REFERENCES – List the specific Flight Manual supplement and hover performance charts used to derive Computed Gross Weight for Line 7b. Separate charts may be required to derive HIGE, HOGE and HOGE-J. HIGE: use Hover-In-Ground-Effect, External/Cargo Hook Chart (if available). HOGE & HOGE-J: use Hover-Out-Ground-Effect charts for all HOGE operations.

7b. COMPUTED GROSS WEIGHT - compute gross weights for HIGE, HOGE and HOGE-J from appropriate Flight Manual hover performance charts using the Pressure Altitude (PA) and temperature (OAT) from the most restrictive location, either Departure or Destination. Check the box in Line 1 (Departure) or Line 2 (Destination) to indicate which values were used to obtain Computed Gross Weight.

8. WEIGHT REDUCTION – The Government Weight Reduction is required for all “non-jettisonable” loads. The Weight Reduction is optional (mutual agreement between Pilot and Helicopter Manager) when carrying jettisonable loads (HOGE-J) where the pilot has total jettison control. The appropriate Weight Reduction value, for make & model, can be found in the current helicopter procurement document (contract).

9. ADJUSTED WEIGHT – Line 7b minus Line 8.

10. GROSS WEIGHT LIMITATION – Enter applicable gross weight limit from Limitations section of the basic Flight Manual or the appropriate Flight Manual Supplement. This may be Maximum Gross Weight Limit for Take-Off and Landing, a Weight/Altitude/Temperature (WAT) limitation or a Maximum Gross Weight Limit for External Load (jettisonable). Limitations may vary for HIGE, HOGE and HOGE-J.

11. SELECTED WEIGHT – The lowest weight, either line 9 or 10, will be entered for all loads. Applicable limitations in the Flight Manual must not be exceeded.

12. OPERATING WEIGHT – Use the value entered in Line 6.

13. ALLOWABLE PAYLOAD – Line 11 minus Line 12. The maximum allowable weight (passengers and/or cargo) that can be carried for the mission. Allowable Payload may differ for HIGE, HOGE and HOGE-J.

14. PASSENGERS AND/OR CARGO – Enter passenger names and weights and/or type and weights of cargo to be transported. Include mission accessories, tools, gear, baggage, etc. A separate manifest may be used.

15. ACTUAL PAYLOAD – Total of all weights listed in Item 14. Actual payload must not exceed Allowable Payload for the intended mission profile, i.e. HIGE, HOGE or HOGE-J.

    Both Pilot and Helicopter Manager must review and sign the form. Check if HazMat is being transported. Manager must inform the pilot of type, quantity and location of HazMat on board.

INTERAGENCY HELICOPTER LOAD CALCULATION Electronic Version 1.0 (3/04)		MODEL		
	N#			
PILOT(S)		DATE		
MISSION		TIME		
1 **DEPARTURE**	**PA**	**OAT**		
2 **DESTINATION**	**PA**	**OAT**		
3 **HELICOPTER EQUIPPED WEIGHT**				
4 **FLIGHT CREW WEIGHT**				
5 **FUEL WEIGHT** **gals X lbs/gal**				
6 **OPERATING WEIGHT** (3 + 4 + 5)				
	Non-Jettisonable		Jettisonable	
	HIGE	HOGE	HOGE- J	
7a **PERFORMANCE REFERENCE** (List chart/ supplement from Flight Manual)				
7b **COMPUTED GROSS WEIGHT** (From Flight Manual **Performance** Section)				
8 **WEIGHT REDUCTION** (Required for all Non-Jettisonable loads)				
9 **ADJUSTED WEIGHT** (7b minus 8)				
10 **GROSS WEIGHT LIMITATION** (From Flight Manual **Limitations** Section)				
11 **SELECTED WEIGHT** (**Lowest** of 9 or 10)				
12 **OPERATING WEIGHT** (From Line 6)				
13 **ALLOWABLE PAYLOAD** (11 minus 12) Exceeds = Allowable Exceeded				
14 **PASSENGERS/CARGO**				
15 **ACTUAL PAYLOAD** (Total of all weights listed in Item 14) Line 15 must not exceed Line 13 for the intended mission (HIGE, HOGE or HOGE-J)				
PILOT SIGNATURE			HazMat Onboard	
MANAGER SIGNATURE			YES	NO

HCM-8 (01/05)

Electronic Load Calculation Guidelines

The electronic load calculation is available as a training tool or may be used in lieu of the booklet form. The form is an Excel worksheet and makes automatic computations as data is entered by the Pilot or government representative. It is really no different than the paper version; ***Equipped Weight, Computed Gross Weight and Gross Weight Limitations must be derived by flight manual reference and entered by the pilot.***

Please be aware of the following important notes:

1. If you receive this as an E-mail attachment, save to hard drive prior to using.
2. The entire worksheet is protected. The format and function cannot be altered.
3. Worksheets can be completed, named and saved individually.
4. As the cursor is moved over a field, a Comment Box will appear offering explanation or instruction for that field.
5. Information is entered into the yellow fields by the user.
6. The blue cells are locked and data cannot be entered by the user. They perform automatic functions.
7. If the electronic format is used for actual helicopter operations, the form must be printed out in black & white, signed by the Pilot and Helicopter Manager and retained.

I. Interagency Helicopter Passenger/Cargo Manifest.

1. Purpose. The purpose is to enable the Helicopter Manager to manifest successive trips using the allowable payload (or a current allowable, given fuel consumption) on the applicable Helicopter Load Calculation.

   NOTE: A new Load Calculation does not have to be completed each time the helicopter takes off, provided that the operating weight of the helicopter, temperature, and pressure altitude in the area of operations have not increased beyond those specified from the calculation. The Passenger/Cargo Manifest may be used instead.

2. Applicability. If successive trips are made under one load calculation, then a manifest is required for documentation and to ensure the allowable is not exceeded. Each manifested trip's actual payload must not exceed the allowable payload in Block 13 of the load calculation. Once there is an increase in either operating weight (for example, more fuel added), in the temperature, and/or in the pressure altitude used to compute the original maximum allowable payload, then a new load calculation must be completed.

3. Responsibility and Instructions for Completion. It is the responsibility of the Helicopter Manager or other authorized individual to complete a manifest prior to each flight leg flown. It is the responsibility of the Pilot to ensure the actual payload on a manifest does not exceed the allowable payload on the load calculation.

   NOTE: Handcrews may provide a pre-completed crew manifest using their own format. This practice is acceptable as long as the information on the form is accurate and verified.

   Specific instructions for completion of the manifest are as follows:

ITEM	INSTRUCTIONS
Helicopter #	Enter the FAA registration number of the helicopter.
Pilot	Enter the name of the Pilot In Command of the mission being manifested.
Time	Enter the time that the manifest was prepared.
Date	Enter today's date.
Departure	Enter the name of the location for the departure point.
Destination	Enter the name of the location for the destination point.
Allowable Payload At: (1)	Utilize the first set of "LBS. Fuel, PA, OAT, and HIGE/HOGE/HOGE-J" to record load calculation values
LBS. Fuel	Enter the weight of fuel as indicated on the load calculation form (line 5) calculated for this trip.

PA	Enter the Pressure Altitude that was utilized to obtain Computed Gross Weight as indicated on the load calculation form (line 1 or 2) calculated for this trip.
OAT	Enter the Outside Air Temperature that was utilized to obtain Computed Gross Weight as indicated on the load calculation form (line 1 or 2) calculated for this trip.
HIGE/HOGE/ HOGE-J	Enter the Allowable Payloads as indicated on the load calculation form (line 13) calculated for this trip.
Allowable Payload At: (2)	Utilize the second set of “LBS. Fuel, PA, OAT, and HIGE/HOGE/HOGE-J” as a means to utilize fuel burn, or for performance planning for an alternate landing area.
	The weight of fuel consumed during a flight can be “added” to the allowable payload. Pilots and managers must ensure that any estimate of fuel burned off is accurate prior to landing at the destination.
#	Enter the trip or passenger number (optional).
Name/Cargo	Enter individual’s name or type/kind of cargo. For external load operations enter the rigging required for the operation (i.e. net, swivel, longline, bucket, etc). For water, foam, or retardant drops, enter the bucket or tank capacity.
Weight	Enter passenger’s or cargo’s weight. Do <u>not</u> estimate. For water, foam, or retardant drops, enter the weight of the load in the bucket for one dip, not <u>the number of gallons</u>.
Actual Payload	The actual payload for a trip should be entered in the right-hand column (note that more than one trip may be documented on the manifest).
Hazardous Materials /Location	Enter Hazardous Materials information per the Interagency Aviation Transport of Hazardous Materials Handbook
Manifest Preparer	Individual preparing the manifest signs (Helicopter Manager or designee).

4. Routing and Filing.
   - Fire. At the termination of fire assignments, the Helicopter Manager is responsible for submitting copies of all load calculations, with manifests attached, to the Helibase Manager. These copies become part of the incident file.
   - Project. At the termination of a project helicopter flight, the Helicopter Manager is responsible for attaching all manifests to their appropriate load calculation and submitting them to the predetermined agency Aviation Manager or designee (for example, the Dispatcher). That individual includes the manifests as part of the flight file.
5. Posting. None.
6. Related Forms. Form HCM-8, Helicopter Load Calculation, is used to document manifest information under one “umbrella” load calculation. Load calculation and manifest totals are collated on Form HCM-15, Helicopter Daily Use and Cost Summary. Manifests are utilized to complete the agency flight payment document.

Exhibit A-8: Form HCM-9 Interagency Helicopter Passenger/Cargo Manifest

Helicopter # : ________ **Pilot:** ________________ **Time:** ________ **Date:** ________

Departure: ________________________ **Destination:** ________________________

Allowable Payload At: **LBS. FUEL:** ____________ **PA:** ________ **OAT:** __________

HIGE: ________________ **HOGE:** ________________ **HOGE-J:** ________________

Allowable Payload At: **LBS. FUEL:** ____________ **PA:** ________ **OAT:** __________

HIGE: ________________ **HOGE:** ________________ **HOGE-J:** ________________

#	NAME/CARGO	WEIGHT

HAZARDOUS MATERIALS	LOCATION	
	ACTUAL PAYLOAD	

MANIFEST PREPARER: ____

HCM-9 (01/05) *Optional

J. Helicopter Load Capability Summary- Multiple Helispots (HCM-10).

1. Purpose. The purpose is to enable the Helicopter Manager to plan mission loads safely and efficiently to different elevations or helispots at different temperatures with different fuel loads.

2. Applicability. The form is optional, but should be used on incidents or projects where multiple helispots have been established. It may be required by the incident air operations staff.

3. Responsibility and Instructions For Completion. See Exhibit A-9. The Helicopter Manager is responsible for ensuring the form is completed and updated as new helispots are established.

   - Block 1: Aircraft Information. Enter information as indicated.

   - Block 2: Allowable Payloads. Complete the matrix by calculating allowable payloads, both HIGE and HOGE, with full or working fuel load, to different helispots or elevations for temperatures appropriate to the area.

   It is essential that the load calculation form and appropriate flight manual performance charts be used to determine allowable payloads. A load calculation form must be completed for every temperature, elevation, and fuel load indicated on the form. However, once a load calculation is completed, the information on Form CHM-10 may be utilized in conjunction with the Helicopter Passenger/Cargo Manifest.

   - Block 3: Payload Adjustments. Depending on the size helicopter and fuel capacity, enter increased payload capability in pounds as fuel weight is reduced.

   Utilizing the load calculation form, Form HCM-10 should be updated as additional helispots are established.

4. Routing and Filing. At multiple-aircraft helibases, the Helicopter Manager should submit the form to the Helibase Manager.

5. Posting. The form should be posted on the helibase display board.

6. Related Forms. Form HCM-8, Helicopter Load Calculation, is used to calculate information. Loads are documented on HCM-9, Helicopter Passenger/Cargo Manifest. Form HBM-4, Allowable Payload Chart, Form HBM-5, Flight Following Log, and Form HBM-5, Resource Capability Planning Chart may be completed from information supplied by Form HCM-10.

Exhibit A-9: Form HCM-10 Helicopter Load Capability Summary - Multiple Helispots And Fuel Loads

HELICOPTER LOAD CAPABILITY SUMMARY - MULTIPLE HELISPOTS AND FUEL LOADS

DATE: ____________

N # : ____________ **MAKE/MODEL:** ________________________ **A/C EQUIPPED WT:** ____________

PILOT(s): ________________ ________________ **FLIGHT CREW WT:** ____________

Location:						
Pressure Altitude:						

ALLOWABLE PAYLOAD FOR FOLLOWING FUEL LOAD: [ ] **Gallons** = [ ] **LBS. Fuel**

Outside Air Temperature	HIGE / HOGE	HIGE / HOGE	HIGE / HOGE	HIGE / HOGE	HIGE / HOGE	HIGE / HOGE
15C	/	/	/	/	/	/
20C	/	/	/	/	/	/
25C	/	/	/	/	/	/
30C	/	/	/	/	/	/
35C	/	/	/	/	/	/
40C	/	/	/	/	/	/
45C	/	/	/	/	/	/
	/	/	/	/	/	/
	/	/	/	/	/	/

ALLOWABLE PAYLOAD ADJUSTMENTS: Add This Weight to Allowable Payload **ONLY** if On-Board Fuel is **Less Than** the Fuel Load Indicated Above!

IF ______ **Gals Fuel, Add** ______ **LBS** **IF** ______ **Gals Fuel, Add** ______ **LBS** **IF** ______ **Gals Fuel, Add** ______ **LBS**

IF ______ **Gals Fuel, Add** ______ **LBS** **IF** ______ **Gals Fuel, Add** ______ **LBS** **IF** ______ **Gals Fuel, Add** ______ **LBS**

Pilot Signature: ____________________ **Helicopter Manager Signature:** ____________________

HCM-10 (01/05) OPTIONAL

K. Aircraft Dispatch Form HCM-11 (NFES-2657).

1. Purpose. The purposes of the form are to:

    - Provide the Helicopter Manager and Pilot with dispatch information critical to flight safety and efficiency (note that block numbers correspond exactly to those on the dispatcher's Resource Order);
    - Provide accurate information concerning individual incidents during multiple-fire situations;
    - Provide information (for example, incident number and Hobbs Meter start/end readings) essential for accurate completion of agency payment documents.

2. Applicability. This form is optional. If utilized, it should be completed for all fire helicopter initial attack missions, both exclusive-use contract and CWN. It is not intended to be used for mission dispatch, other than initial attack, at incident helibases.
3. Responsibility and Instructions For Completion. See Exhibit A-10. The Helicopter Manager completes the form. The Dispatcher provides the information to the Helicopter Manager prior to or immediately after dispatch by phone or by radio.
4. Routing and Filing. Copies are kept as part of the helicopter crew file.
5. Posting. None.
6. Related Forms. Agency flight payment document can be completed from information entered (for example, billing numbers).

Exhibit A-10: Form HCM-11 Aircraft Dispatch

DATE:	TIME:	SUNSET + 30:
INCIDENT NAME:		INCIDENT # :
DESCRIPTIVE LOCATION: T: R: S: 1/4:		ELEVATION
LAT: LONG:		
BEARING (DEG):	DISTANCE (SM/NM):	FROM:
FLIGHT FOLLOWING:	F/F FREQUENCY:	TONE:
AIR CONTACT:	A/A FREQUENCY:	TONE:
GROUND CONTACT:	A/G FREQUENCY:	TONE:
OTHER AIRCRAFT:		
HAZARDS:		
MTR/SUA: ☐ YES ☐ NO	TFR: ☐ YES ☐ NO	
COMMENTS:		RELOAD BASE:

NFES #2657 NIFC 9400-31 (5/02) **HCM-11 (01/05) OPTIONAL**

L. Pilot Flight Time/Duty Day Cumulative Log (HCM-12), Driver (Helicopter Attendant) Driving Time/Duty Day Cumulative Log (HCM-13), and Mechanic Duty Day Cumulative Log (HCM-14).

1. Purpose. The purpose of these forms is to enable the Helicopter Manager to track contract or CWN Pilot, Driver, and Mechanic flight time or driving time (as applicable), as well as duty day, so that limitations are not exceeded.
2. Applicability. HCM-12 and HCM-14 are required for all contract aircraft. It is also mandatory for CWN and rental aircraft used for more than four continuous days. It is advisable to initiate these forms immediately at the start of any incident CWN or rental use.
3. Responsibility and Instructions for Completion. See Exhibits A-11, A-12, and A-13. Completion is self-explanatory. Helicopter Managers are responsible for making entries to the form on a daily basis for the period of the contract, or, for CWN, for the period of use. If user is filling out the electronic version, refer to electronic help text for correct procedure on entering Pilot day off to ensure cumulative flight time feature works.

   It is the responsibility of Helicopter Managers to inform the Helibase Manager of flight time, driving time, or duty day limitations that may interfere with planned operations.

4. Posting. None at incident helibases. It may be posted at the permanent helibase for exclusive-use contracts crews, but must be taken on off-unit dispatches.
5. Routing and Filing. No routing is necessary. Completed logs become part of the contract file.
6. Related Forms. Form HCM-1, Aircraft Contract Daily Diary. An agency incident/hazard report is submitted if limitations are exceeded.

Exhibit A-11: Form HCM-12 Pilot Flight Time/Duty Day Cumulative Log

PILOT FLIGHT TIME/DUTY DAY CUMULATIVE LOG

Pilot Name: ____________________ **Last Date(s) Off-Duty:** ____________________

Flight Time or, Off, for the Last 5 Consecutive Days:	Day 5	Day 4	Day 3	Day 2	Day 1

Insert Dates of Next 7 Days:							
Earliest Pilot Can Be On-Duty:							
Actual On-Duty Time (Including Preflight)							
Add 14 Hours For Maximum Duty Day	*+ 14:00*	*+ 14:00*	*+ 14:00*	*+ 14:00*	*+ 14:00*	*+ 14:00*	*+ 14:00*
Must Be Off-Duty At:							
Actual Off-Duty Time:							
Cumulative Flight Time Previous 5 Days:							
Total Flight Time Today:	+	+	+	+	+	+	+
Total Flight Time This 6-Day Period:							

Insert Dates of Next 7 Days:							
Earliest Pilot Can Be On-Duty:							
Actual On-Duty Time (Including Preflight)							
Add 14 Hours For Maximum Duty Day	*+ 14:00*	*+ 14:00*	*+ 14:00*	*+ 14:00*	*+ 14:00*	*+ 14:00*	*+ 14:00*
Must Be Off-Duty At:							
Actual Off-Duty Time:							
Cumulative Flight Time Previous 5 Days:							
Total Flight Time Today:	+	+	+	+	+	+	+
Total Flight Time This 6-Day Period:							

Max Flight Time: 8:00 *Hours **Max Duty Day: 14:00 *Hours** **Min Rest Period: 10:00 *Hours** **Required Days Off: 2 Days in 14***

A Maximum of 42* hours flight time may be flown during any consecutive six-day period. When a pilot accrues 36* or more flight hours in a consecutive six-day period, the pilot will be given the following full calendar day off-duty. Following any day-off, a new six-day cycle begins with 0 cumulative flight time.

*DOI and USFS Standards. Other Agency Standards may vary.

HCM-12 (01/05) REQUIRED

Exhibit A-12: Form HCM-13 Driver (Helicopter Attendant) Driving Time/Duty Day Cumulative Log

FUEL SERVICING DRIVER DUTY DAY CUMULATIVE LOG

Driver Name: ______________________ **Last Date(s) Off-Duty:** ____________

Insert Dates of Next 7 Days:							
Actual On-Duty Time							
Actual Off-Duty Time:							

Insert Dates of Next 7 Days:							
Actual On-Duty Time							
Actual Off-Duty Time:							

Insert Dates of Next 7 Days:							
Actual On-Duty Time							
Actual Off-Duty Time:							

Max Duty Day: Per DOT **Min Rest Period: Per DOT** **Required Days Off: 2 Days in 14****

It is the Contractors' responsibility to insure that employees comply with DOT Safety Regulation 49 CFR Part 390-399, including duty limitations. Fuel servicing vehicle drivers may be removed from duty for fatigue or other causes created by unusually strenuous or severe duty before reaching duty limitations. The fuel servicing vehicle driver will be responsible to keep the Government apprised of their ground duty limitation status. Notwithstanding DOT Safety Regulation 49 CFR Part 390-399, the fuel servicing vehicle driver shall have a minimum of two (2) full calendar days off duty during any 14-day period. Off duty days need not be consecutive.

*DOI and USFS Standards. Other Agency Standards may vary.

HCM-13 (01/05) OPTIONAL

Exhibit A-13: Form HCM-14 Mechanic Duty Day Cumulative Log

MECHANIC DUTY DAY CUMULATIVE LOG

Mechanic Name: ____________________ **Last Date(s) Off-Duty:** ____________________

Insert Dates of Next 7 Days:							
Earliest Mechanic Can Be On-Duty:							
Actual On-Duty Time (Including Preflight)							
Add 16 Hours For Maximum Duty Day	***+ 16:00***	***+ 16:00***	***+ 16:00***	***+ 16:00***	***+ 16:00***	***+ 16:00***	***+ 16:00***
Must Be Off-Duty At:							
Actual Off-Duty Time:							

Insert Dates of Next 7 Days:							
Earliest Mechanic Can Be On-Duty:							
Actual On-Duty Time (Including Preflight)							
Add 16 Hours For Maximum Duty Day	***+ 16:00***	***+ 16:00***	***+ 16:00***	***+ 16:00***	***+ 16:00***	***+ 16:00***	***+ 16:00***
Must Be Off-Duty At:							
Actual Off-Duty Time:							

Insert Dates of Next 7 Days:							
Earliest Mechanic Can Be On-Duty:							
Actual On-Duty Time (Including Preflight)							
Add 16 Hours For Maximum Duty Day	***+ 16:00***	***+ 16:00***	***+ 16:00***	***+ 16:00***	***+ 16:00***	***+ 16:00***	***+ 16:00***
Must Be Off-Duty At:							
Actual Off-Duty Time:							

Max Duty Day: 16:00 *Hours **Min Rest Period: 8:00 *Hours** **Required Days Off: 2 Days in 14***

*DOI and USFS Standards. Other Agency Standards may vary.

HCM-14 (01/05) REQUIRED

M. Helicopter Daily Use and Cost Summary (HCM-17).

1. Purpose. The purpose is to enable the Helicopter Manager to summarize daily use and costs for the helicopter.

2. Applicability. The form is required on incidents to which a Type I or II Incident Management Team (IMT) is assigned. However, the air operations staff on a Type I or II Team will usually require that the Helibase Manager(s) submit summaries from the day of initial attack. Helicopter and Helibase Managers should therefore be prepared to furnish this information once an IMT is assigned.

   It may also be required on projects at the Project Aviation Manager's option.

3. Responsibility and Instructions for Completion. See Exhibit A-14. See Chapter 15 and Appendix B for further information.

   Each Helicopter Manager is responsible for completing the Helicopter Daily Use and Cost Summary at the end of each day's operational period. The Helicopter Manager submits it to the Helibase Manager.

   Use totals are gathered from load calculations and manifest forms. The Helicopter Manager should ensure:

   - If daily flight guarantees are not met for CWN or rental helicopters, that these costs are included on the summary.
   - If daily/hourly availability or guarantee costs on exclusive-use contract helicopters are already paid from presuppression funding, that these costs are not included on the summary.

   Mobilization costs (for example, ferry time to the incident, service truck miles, etc.) must be included on the first Summary submitted. Demobilization costs should be estimated and a final Summary submitted to the Helibase Manager prior to the departure of the helicopter from the incident or project.

4. Posting. None.

5. Routing and Filing. The Helicopter Manager gives the summary to the Helibase Manager. A copy of each helicopter's cost summary should be made part of the helibase file.

6. Related Forms. Helicopter load calculations and manifests forms are used to complete the Summary. The Helibase Manager completes Form HBM-11, Helibase Daily Use and Cost Summary, from helicopter summaries.

Exhibit A-14: Aircraft Daily Use And Cost Summary HCM-17

Activity/Mission: __ **Large Fire** __ **Initial Attack** __ **Project** **Date:** _________

Helibase: ____________________ **Incident:** ____________________ **Agency:** ___________

N #: _________ **Make/Model:** _____________ **Manager's Name:** ____________________

Type: __ **1** __ **2** __ **3** __ **CWN** __ **Exclusive Use** __ **Other (Specify):** _____________

Flight Invoice Reference Number(s): ____________________________________

	Quantity	Rate	Cost:
Revenue Flight Hours:			
*Availability (Hours or Day):			
Pilot Extended Standby:			
Driver Extended Standby:			
Mechanic Extended Standby:			
Per Diem # of Persons:			
Service Truck Miles:			
Additional Cost:			
Additional Cost:			
Additional Cost:			
Additional Cost:			
		Daily Grand Total Cost:	

* Do Not calculate for exclusive use contracts where availability is paid from pre-suppression funds

Use Summary:

Total PAX Transported	Total Pounds Cargo	Total Gallons Water	Total Gallons Retardant	Total Gallons Foam

Aerial Ignition

Acres Treated	PSD Spheres Used	Gallons Helitorch Gel Used

Cost Apportionment (If Applicable)

Agency	Percent	Cost

HCM-15 (01/05) REQUIRED

APPENDIX B: HELIBASE MANAGEMENT FORMS AND CHECKLISTS

I. Introduction and Purpose.

This appendix provides standardized for the management and operation of helibases. A discussion of helibase-related (ICS) Incident Command System forms, checklists, evaluations, and job aids, is also included.

Such standardization helps to implement common procedures among participating agencies to meet mutual safety, efficiency, fiscal management, and contract administration objectives. The forms also provide a basis for training development and presentation.

II. Applicability.

The forms in this appendix are to be utilized by Helibase Managers, whereas those in Appendix A are utilized by Helicopter Managers in the management and operation of a single helicopter.

However, several of the Helicopter Management (HCM-series) forms contribute to the informational needs of the Helibase Management (HBM-series) forms.

It is therefore essential that Helicopter Managers use these forms as appropriate or required when operating as part of a helibase organization, and that Helibase Managers ensure that appropriate HCM forms are completed timely and accurately.

Some of the forms are required for all helibase operations, some are required only for incident operations. Others are optional and may be used at the discretion of the Helibase Manager. Certain optional forms may be required by the air operations staff at an incident or project due to a specific management informational need.

Chart B-1 on the following pages is a summary listing of the HBM-series and other checklists and job aids. Included is information concerning the purpose of the form, the HBM form number, whether a form is optional or required for all or only certain situations, responsibility for completion, and frequency of completion. The Helibase Manager may use this chart as a quick- reference guide to form requirements. The pages following the chart contain a comprehensive discussion of each form.

All Helibase Managers should obtain sets of all forms so that they may respond to different management requirements encountered. Recognizing that at most incidents, or prior to a project's start that copies may be reproduced, Chapter 9 provides recommendations concerning the number of forms to carry in the Helibase Manager's Kit.

Form Name	Purpose	IHOG Form # Required or Optional	Individual Responsible for Completion	Frequency	Remarks
All required forms must be completed and implemented by the start of the second operational shift when two or more helicopters are assigned to an incident base. On project helibases where two or more helicopters are assigned, they must be completed or implemented at the start of the first operational shift.					
Helibase Organizational Chart	To identify by name those persons filling positions on the helibase.	HBM-1 Required	Helibase Manager or Deck Coordinator	Updated daily	Obtain information on qualifications from HCM-7 Helicopter Crew Information Sheet
Helibase Complexity Analysis	To assist in assessing helibase operations to help determine if a HEB1 should be ordered	HBM-1A	Helibase/Aviation Manager	Prior to the start of a project or as needed as complexity changes	
Aviation Locations Summary	To provide information on helispots, dipsites, and other locations pertinent to the aviation operation	HBM-2 Required	Helibase Manager	Updated daily	Brief all new pilots and managers as appropriate
Helibase Aircraft Information Summary	To provide Air Operations staff with a summary on assigned aircraft	HBM-3 Required	Helibase Manager	Update as new aircraft are assigned	Copies to Air Support Group Supervisor (ASGS) and Air Operations Branch Director (AOBD)
Allowable Payload Chart	To provide helibase management personnel a means to plan mission loads safely and efficiently	HBM-4 Optional	Helibase Manager	Update as new aircraft or aviation locations are assigned.	Use information from Aviation Locations Summary, Load Calculations, and Helicopter Load Capability Summary
Flight Following Log	To enable the Aircraft Base Radio Operator to record flight following information so the location of an aircraft is immediately known	HBM-5 Optional - see remarks	Aircraft Base Radio Operator	As needed	Information from the form is required, but other forms may be used
Flight Hours Tracking (Multiple Helicopters)	To allow tracking of helicopter flight time over the course of the day	HBM-5A Optional	Aircraft Timekeeper or Aircraft Base Radio Operator	As needed	Ensures there will be sufficient flight time for required missions and enables flight time to be spread equitably over all assigned aircraft.
Helibase Mission Request Log	To establish an orderly mission request process for use by the Helibase Manager in prioritizing and assigning helicopter missions	HBM-6 Required	Aircraft Base Radio Operator	As needed	Enter initial mission assignments from current ICS-220
Helibase Daily Use and Cost Summary	To track cost and use on an incident or project	HBM-7 Required	Helibase Manager or Aircraft Timekeeper	At end of operational shift	Copies to Cost Unit and ASGS/ AOBD
Helibase Communications Plan	To track currently assigned frequencies being used by the helibase	HBM-8 Optional	Helibase Manager	As changes occur	Ensure updates are completed as changes occur
Helicopter Demobilization Information	Provides information on demobilization times, routes, stops, and layovers	HBM-9 Optional	Helicopter Manager	As helicopters are demobed	Copy to AOBD and Demobe Unit
Helicopter Flight Schedule	Provide flight itinerary information to dispatch system	HBM-9A Optional	Helicopter Manager	As helicopters are demobed	Copy to AOBD and local dispatch center
Helibase Diagram	Provides helibase layout and local flight hazard, and flight route information	HBM-10 Optional	Deck Coordinator	Complete as needed	If used, ensure hazard information and flight routes are depicted

Form Name	Purpose	IHOG Form # Required or Optional	Individual Responsible for Completion	Frequency	Remarks
All required forms must be completed and implemented by the start of the second operational shift when two or more helicopters are assigned to an incident base. On project helibases where two or more helicopters are assigned, they must be completed or implemented at the start of the first operational shift.					
Helibase Cumulative Cost Summary	Allows tracking of helibase costs over the course of an incident or project	HBM-11 Optional	Helibase Manager	Update daily	Use information from HBM-7
Helitack Crews Performance Rating	Allows a mechanism to rate helitack crew on helicopter/helibase specific missions	HBM-12 Optional	Helibase Manager	At end of assignment	Copies should be kept from helibase record and a copy should be sent to crew's home unit
Helibase Personnel Performance Rating	Allows a mechanism to rate single resource helicopter personnel on helicopter/helibase specific missions	HBM-13 Optional	Helibase Supervisor	At end of assignment	Copies should be kept for helibase record and a copy should be sent to the crew's home unit
Two-For-One CWN Management and/or Standard to Limited Request	An approval system to allow a manager to manage two limited or restricted category helicopters, or designate a standard category aircraft as limited use	HBM-14 Optional	State or regional level Aviation Manager	Each occurrence	Other methods of approval may be used, depending on agency policy
Daily Helicopter Operations Briefing Checklist	Enables the Helibase Manager to review all applicable procedures and policies are in place for a safe and efficient helicopter operation	HJA-1 Required	Helibase Manager	Daily	See Appendix F for the checklist and for further information
Helibase Manager Reminder List	Enables the Helibase Manager to review items, systems, and procedures applicable to helibase operations	HJA-2 Optional	Helibase Manager	Daily or as needed	See Appendix H for the checklist and for further information
Remote Fuel Site Reminder List	Enables the Helibase Manager to review items, systems, and procedures applicable to remote fuel site operations	HJA-3 Optional	Helibase Manager	During initial establishment of helibase and updated as necessary	See Appendix I for the checklist and for further information
Crash Rescue/ Medevac/Evacuation Plan	Provides procedures and protocols for crash rescue, medevac and helibase evacuation missions.	HJA-4 *Optional	Helibase Manager	During initial establishment of helibase and updated as necessary	See Appendix C for Plan. A crash rescue and medevac plan is required for all helibases. Other formats may be used
Emergency Rescue Information	Identifies assigned medevac helicopters, medical facility information, and air ambulance/life flight information	HJA-4A Required	Helibase Manager	During initial establishment of helibase and updated as necessary	See Appendix C for further information
Emergency Medevac and Medical Transport Request	To provide additional information for aircraft responding to a medevac or medical transport	HJA-4B *Optional	Aircraft Base Radio Operator	As medical incident occur	See Appendix C for further information

* Optional information must be documented, other formats are acceptable.

III. Helibase Management (HBM) Forms.

IMPORTANT NOTE: The Helibase Management (HBM) forms or checklists that are required must be completed or implemented by the second operational period on incident helibases or helispots to which two or more helicopters are assigned.

On project helibases with two or more helicopters assigned, the required forms must be completed or implemented prior to the start of the first day's operations. The requirement for project helibases is stricter than that for incidents due to the ability of the project's Helibase Manager to plan in advance of the operation.

A. Helibase Organization Chart (HBM-1).

1. Purpose. The purpose is to establish, by name, those positions filled on a helibase, as well as provide other information concerning aircraft and radio frequencies assigned.
2. Applicability. The form is required and must be initiated by the second operational period on incident helibases or helispots to which two or more helicopters are assigned. On project helibases with two or more helicopters assigned, the form must be completed prior to the start of the first day's operations.
3. Responsibility and Instructions For Completion. Refer to Exhibit B-1. Refer also to Chapter 15 for further information on making daily assignments.

   The Helibase Manager is responsible for completion. Names are entered at the start of helibase operations. Position assignments are reviewed daily, and appropriate changes in the chart are made as needed. The Helibase Manager must ensure that personnel assigned to fulfill a function are qualified (see "Related Forms" below).

4. Routing and Filing. No routing is necessary. The form becomes part of the helibase file.
5. Posting. The form is posted on the helibase display board. Information may also be transferred to an organization board carried by many helicopter crews.
6. Related Forms. Forms HCM-7, Helicopter Crew Information Sheet, should be consulted prior to making assignments in order to ensure qualified personnel are filling positions. Frequencies are obtained from the day's ICS-220, Air Operations Summary and the ICS-205, Incident Radio Communications Plan.

Exhibit B-1: Helibase Organization Chart (HBM-1)

DATE: ____________ **HELIBASE:** ____________

Helicopters Assigned

N#	Type	Manager	N#	Type	Manager

Air Support Group Sup

Supply Unit Liaison

Mixmaster

Helibase Manager

Medivac A/C

Initial Attack A/C

Takeoff and Landing Coordinator

Helibase Radio Operator

Aircraft Timekeeper

Helispot Managers

Spot #	Name

Deck Coordinator

Personnel Loadmaster

Cargo Loadmaster

Crash Rescue Supervisor

Pad #	Parking Tender	Pad #	Parking Tender

HBM-1 (01/05) REQUIRED

B. Helibase Complexity Analysis (HBM-1A).

1. Purpose. The Helibase Management Incident Complexity Analysis is intended to assist a HEB2/ AOBD/Unit Aviation Manager in assessing the complexities of operations at their Helibase(s) to help determine if a HEB1 should be ordered.

   This is a risk analysis tool that would help to quantify the complexity of an incident helibase operation and support a decision to request an HEB1, if the number of assigned helicopters is five or less.

   Six or more helicopters assigned to the helibase would automatically require a Helibase Manager Type 1.

2. Applicability. This analysis is applicable to all helibases.
3. Responsibility and Instructions for Completion. This complexity analysis would be completed by the helibase/aviation manager.
4. Posting. This form is not required to be posted.
5. Routing and Filing. This complexity analysis would be routed through the helibase/ aviation manager's supervisor.
6. Related Forms. This analysis is related to HBM-1 since it is will be used to determine the level of management at a Helibase.

Exhibit B-2: Helibase Complexity Analysis (HBM-1A)

Helibase Management Incident Complexity Analysis (Type 1, 2)

6 or more helicopters utilizing helibase – Automatic Type 1 Manager required

Incident Name:________________________________Date:________________

Number of Helicopters & Type (Machine)	**Yes**	**No**
4 or more helicopters working out of helibase		
Restricted or Limited helicopters comprise less than 40% of helibase aircraft.		
Multiple separate helibases are assigned to incident		
Incident Management (Man)		
No IMT overseeing operation/ or IMT without AOBD or ASGS and/or ATGS		
Host unit does not have “Stand-Alone” Aviation Manager or Aviation Manager is not available for assistance		
No more than 1 Exclusive Use Helitack crew on helibase		
Trainees being used in HEB positions due to shortage of qualified personnel		
Mission profiles (Method)		
Helicopters are the primary method of logistical line support due to inaccessible terrain or remote location		
4 or more 20 person crew shuttles per day		
10 or more external load cargo missions per day		
Tactical water/suppressant delivery is **<u>NOT</u>** the primary missions		
Specialized missions ongoing (Law Enforcement, S&R, Fire-Line-Explosive, Rotor Wing retardant, etc……..)		
Multiple incidents are being supported out of the helibase		
Operational environment (Medium)		
Complex airspace issues (multiple MTRs, MOAs, SUAs etc…..)		
Helibase located at an airport with a moderate amount of GA activity		
Helibase communications questionable, (Flight following, command, etc……..)		
Additional incidents within close proximity		
Frequent smoke inversions or weather complications (morning or afternoon)		
High & Hot environment		
Incident within Wildland Urban Interface (WUI)		
Multiple Jurisdictions land involved in incident (Fed + State lands)		

If you have checked “Yes” on 10 or more of the analysis boxes, consider requesting the next level of helibase management and/or limit aviation flights until corrections can be made.

Completed By:__________________________________ Date:______________

Management Recipient:____________________________ Date:_______________

C. Aviation Locations Summary (HBM-2).

1. Purpose. The purpose is to provide information concerning helispots and other landing areas (for example, dip sites) for load planning purposes, hazard identification and safety, and Pilot briefings.

2. Applicability. The form is required and must be initiated by the second operational period on incident helibases or helispots to which two or more helicopters are assigned. On project helibases with two or more helicopters assigned, the form must be completed prior to the start of the first day's operations.

3. Responsibility and Instructions For Completion. Refer to Exhibit B-2. Also refer to Chapters 8 and 15 for further information.

   The initial reconnaissance of the incident for purposes of helispot site selection provides a timely opportunity to initiate the form.

   The Helibase Manager is responsible for completion. Often the Helispot Managers and Helibase Manager will jointly complete the Summary. Pilots should always be consulted and briefed concerning the information on the Summary. It should be updated as necessary (additional helispots, helispot improvement to accommodate larger helicopters, etc.).

4. Posting. The Summary is posted on the helibase display board as soon as it is completed.

5. Routing and Filing. The Summary becomes part of the helibase file.

6. Related Forms. The Summary is supplemented by a topographic map showing the locations of all helispots, dip sites, hazards, etc.

Exhibit B-3: Aviation Locations Summary (HBM-2)

Helibase: ____________________

Name of Location	Type of Location	Latitude	Longitude	Altitude (PA)	HIGE/HOGE	Other Info

HBM-2 (01/05) REQUIRED

D. Helibase Aircraft Information Summary (HBM-3).

1. Purpose. The purpose is to provide the Helibase Manager and air operations staff with an informational summary on all aircraft assigned to the helibase(s).
2. Applicability. The form is required for fires with a Type 1 or 2 Incident Management Team assigned, and if requested by project personnel.
3. Responsibility and Instructions For Completion. Refer to Exhibit B-3. The Helibase Manager is responsible for completion, and usually delegates this responsibility to the Aircraft Timekeeper.

   Information is obtained from Forms HCM-6, Helicopter Information Sheets, and Forms HCM-7, Helicopter Crew Information Sheets, submitted by Helicopter Managers upon arrival at the incident or project.

   The form should be updated as additional aircraft arrive.
4. Posting. The form is posted on the helibase display board.
5. Routing and Filing. A current copy of the form is routed to the Air Support Group Supervisor and to the Air Operations Branch Director. The form becomes part of the helibase file.
6. Related Forms. Form HCM-6, Helicopter Information Sheet, and Form HCM-7, Helicopter Crew Information Sheet, provide the necessary information.

Exhibit B-4: Helibase Aircraft Summary (HBM-3)

Helibase: ____________________

N#	Contract CWN or	Pilot Name	FT/Hour	Avail/Day	Pax Seats	Check if Available				
Make/Model	**Fleet**	**Manager + # in Module**	**GT/Day**	**AV/Hour**	**Bucket or Tank Capacity**	**FLIR**	**Longline**	**Rappel**	**Cargo Letdown**	**Foam**
						Other capabilities and comments				
						Other capabilities and comments				
						Other capabilities and comments				
						Other capabilities and comments				
						Other capabilities and comments				
						Other capabilities and comments				
						Other capabilities and comments				
						Other capabilities and comments				

HBM-3 (01/05) REQUIRED

E. Allowable Payload Chart (HBM-4).

1. Purpose. The purpose is to provide helibase management personnel with the means to plan mission loads safely and efficiently. The completed forms can quickly provide the Helibase Manager with information on which aircraft are suitable for different loads to different helispots.

2. Applicability. The form is optional. It may be required by the Helibase Manager to facilitate planning.

3. Responsibility and Instructions For Completion. Refer to Exhibit B-4. The Helibase Manager is responsible for ensuring forms are initially completed and updated as new aircraft arrive on the incident or as new helibases/helispots are established. Actual completion is usually performed by the Deck Coordinator or Loadmasters.

   Enter the allowable IGE/OGE loads for the range of temperatures which may be encountered at the helispot during the day. These figures may be obtained from Form HCM-11, Single Helicopter Load Capability Planning Summary - Multiple Helispots and Fuel Loads.

   The form should be updated as additional aircraft arrive. A new form should be completed as additional helispots are established.

4. Posting. The form is posted on the helibase display board.

5. Routing and Filing. No routing is necessary. The form becomes part of the helibase file.

6. Related Forms. Form HCM-8, Helicopter Load Calculation; Form HCM-10, Single Helicopter Load Capability Planning Summary - Multiple Helispots and Fuel Loads; Form HBM-4, Allowable Payload Chart.

Exhibit B-5: Allowable Payload Chart (HBM-4)

Helispot or Other Location: ____________ **Coordinates:** ____________ **PA:** ________

Allowable Payload (HIGE and HOGE) at Various Temperature Ranges											
N # / Make/ Model		**5° C or 41° F**	**10° C or 50° F**	**15° or 59°**	**20° or 68°**	**25° or 77°**	**30° or 86°**	**35° or 95°**	**40° or 104°**	**45° or 113°**	**50° or 122°**
	IGE										
	OGE										
	IGE										
	OGE										
	IGE										
	OGE										
	IGE										
	OGE										
	IGE										
	OGE										
	IGE										
	OGE										
	IGE										
	OGE										
	IGE										
	OGE										

HBM-4 (01/05) OPTIONAL

F. Helibase Flight Following Log (HBM-5).

1. Purpose. The purpose is to enable the Helibase Radio Operator to perform helicopter flight following quickly and efficiently, with knowledge of where any given helicopter is at any time.

2. Applicability. The form is optional and should be implemented by the second operational period on incident helibases or helispots to which two or more helicopters are assigned. (It is recommended that the form be implemented on any incident helibase where flight following is being performed on-site, that is, not through the unit dispatch office.) On project helibases with two or more helicopters assigned, the form must be implemented prior to the start of the first day's operations.

> IMPORTANT NOTE: This form is for flight following purposes only; it is not intended for any other use, though information such as round-trip times and total missions for the operational period can be calculated. If additional information is relayed, the Radio Operator should utilize the appropriate format (Helibase Mission Request Log, General Message Form, Unit Log, etc.).

3. Responsibility and Instructions For Completion. Refer to Exhibit B-5. The Helibase Manager is responsible for flight following at a helibase. The Helibase Manager usually delegates this responsibility to the Aircraft Base Radio Operator, who becomes responsible for implementing and making entries on the form. The Radio Operator should inform the Helibase Manager immediately if a helicopter fails to meet a required check-in.

   Completion of individual blocks on the form is self-explanatory.

4. Posting. None (the Radio Operator usually keeps the form in the helibase communications area).

5. Routing and Filing. No routing is necessary. The form becomes part of the helibase file.

6. Related forms. The form should be used in conjunctions with HBM 5 (Flight Following Log) and HBM-6 (Helibase Mission Request Log)

Exhibit B-6: Flight Following Log (HBM-5)

Date:		**Helibase:**	

Aircraft N#	**Time / Hobbs**	**Comments / Destination / Location / etc.**

HBM-5 (01/05) *OPTIONAL

G. Flight Hour Tracking (Multiple Helicopters) (HBM-5A).

1. Purpose. The purpose is to enable the Helibase Manager to track cumulative flight hours over the course of a day on multiple-aircraft projects or incidents. It ensures that there will be sufficient flight time for tasks assigned for the end of the operational period, and that flight time is spread fairly evenly among the helicopters available.

   The primary intent is not to track Pilot flight time/duty day, even though this information can be entered at the top of the form.

2. Applicability. The form is optional. It may be required by the Helibase Manager or air operations staff to facilitate planning. It is recommended that it be used on helibases with a large number of helicopters where tracking of flight time is more difficult.

3. Responsibility and Instructions For Completion. Refer to Exhibit B-6. The Helibase Manager is responsible for ensuring completion. Actual completion is usually performed by the Aircraft Timekeeper.

   Entries are self-explanatory. The Helibase Manager and Helicopter Managers should make entries with whatever frequency (hourly, every four hours, etc.) that is deemed necessary.

4. Posting. None, although it may be posted on the display board. (The Aircraft Timekeeper usually keeps the form in the helibase communications area).

5. Routing and Filing. None.

6. Related Forms. Form HCM-12, Pilot Flight Time/Duty Day Cumulative Log.

Exhibit B-7: Flight Hour Tracking (Multiple Helicopters)

Date:

Helibase:

A/C N#:			
		Start Hobbs:	
		Plus:	8.0
		Maximum End Hobbs:	
Hobbs Reading	Hours Left	Hobbs Reading	Hours Left

A/C N#:			
		Start Hobbs:	
		Plus:	8.0
		Maximum End Hobbs:	
Hobbs Reading	Hours Left	Hobbs Reading	Hours Left

A/C N#:			
		Start Hobbs:	
		Plus:	8.0
		Maximum End Hobbs:	
Hobbs Reading	Hours Left	Hobbs Reading	Hours Left

A/C N#:			
		Start Hobbs:	
		Plus:	8.0
		Maximum End Hobbs:	
Hobbs Reading	Hours Left	Hobbs Reading	Hours Left

A/C N#:			
		Start Hobbs:	
		Plus:	8.0
		Maximum End Hobbs:	
Hobbs Reading	Hours Left	Hobbs Reading	Hours Left

A/C N#:			
		Start Hobbs:	
		Plus:	8.0
		Maximum End Hobbs:	
Hobbs Reading	Hours Left	Hobbs Reading	Hours Left

HBM-5A (01/05) OPTIONAL

H. Helibase Mission Request Log (HBM-6).

1. Purpose. The purpose is to establish an orderly and documented mission request process for use by the Helibase Manager in tracking, prioritizing, and assigning helicopter missions.

2. Applicability. The form is required and must be implemented by the second operational period on incident helibases or helispots to which two or more helicopters are assigned. On project helibases with two or more helicopters assigned, the form must be implemented prior to the start of the first day's operations.

3. Responsibility and Instructions For Completion. Refer to Exhibit B-7. The Helibase Manager is responsible for entering mission requests as received from personnel authorized to request them (for example, Operations Chief or Project Aviation Manager, Air Operations Branch Director, Air Tactical Group Supervisor, Incident Dispatch, etc.).

   This responsibility is usually delegated to the Aircraft Base Radio Operator or Aircraft Timekeeper.

   Personnel receiving mission requests should ensure that personnel are authorized to request them, and that the proper chain-of-command is followed.

   Initial entries should be made at the morning's briefing from the ICS-220 Air Operations Summary or project plan. If the number or scope of missions conflict with available aircraft, obtain priorities from ASGS or AOBD and enter priority in far left- hand column.

   Completion of individual blocks on the form is self-explanatory.

4. Posting. None (the Aircraft Timekeeper or Radio Operator usually keeps the form in the helibase communications area).

5. Routing and Filing. No routing is necessary. The form becomes part of the helibase file.

6. Related Forms. Form ICS-220, Air Operations Summary.

Exhibit B-8: Helibase Mission Request Log (HBM-6)

Helibase: ______ **Incident:** ______ **Date:** ______
Page: ____ **of** ____

Priority	Time Received	Requested By	Received By	Mission	Time Needed	Deliver To	Helicopter Assigned	Completed @

HBM-6 (01/05) REQUIRED

I. Helibase Daily Use and Cost Summary (HBM-7).

1. Purpose. The purpose is to enable the Helibase Manager to meet cost/use reporting requirements of the air operations staff on an incident and of the Project Aviation Manager on a project.

2. Applicability. The form is required on incidents to which a Type I or II Incident Management Team (IMT) is assigned. However, the air operations staff on a Type I or II Team will usually require that the Helibase Manager(s) submit summaries from the day of initial attack. Helicopter and Helibase Managers should therefore be prepared to furnish this information once an IMT is assigned.

   It may also be required on projects where the Project Aviation Manager requires cost summaries.

3. Responsibility and Instructions For Completion. Refer to Exhibit B-8. The Helibase Manager is responsible for completing this form. This responsibility is usually delegated to the Aircraft Timekeeper.

   Entries are made from information provided by Helicopter Managers on Form HCM-15, Helicopter Daily Use and Cost Summary. The Helibase Manager should ensure:

   - If daily flight guarantees are not met on ARA helicopters, that these costs are included on the summary.
   - If daily/hourly availability or guarantee costs on exclusive-use contract helicopters are already paid from presuppression funding, that these costs are not included on the summary.

4. Posting. None.

5. Routing and Filing. The form is routed to the air operations staff on incidents or to the Project Aviation Manager on projects prior to the end of the day. It becomes part of the helibase file.

6. Related Forms. Forms HCM-15, Helicopter Daily Use and Cost Summary, submitted by each Helicopter Manager provide information on individual helicopter costs.

Exhibit B-9: Helibase Daily Use and Cost Summary (HBM-7)

Date: ____ **Helibase Name:** ____ **Incident/Project Name:** ____ **Helibase Manager:** ____

N #	Make/Model	Type	Contract Type	Total PAX Transported	Total Pounds Cargo	Total Gallons Water	Total Gallons Retardant	Total Gallons Foam	Flight Hours	Individual Aircraft Cost
Total Aircraft Use and Cost										

Additional Support Expenses (Itemize Below)	Cost
Total	

Grand Total Cost of Helibase This Operational Period: ____

HBM-7 (01/05) REQUIRED

J. Helibase Communications Plan (HBM-8).

1. Purpose. The purpose is to provide radio frequency information to all pilots and helicopter crew.
2. Applicability. The form is optional in both incidents and projects, but may be required by Air Operations staff or local Aviation Managers.
3. Responsibility and Instructions for Completion. Refer to Exhibit B-9. The Helibase Manager is responsible for completing the form. It is essential that the Air Operations Branch Director (AOBD) or Air Support Group Supervisor (ASGS) communicate and coordinate with the communications Unit Leader concerning frequency needs and assignments. The frequencies on the ICS-205 must match those identified on the ICS-220 Air Operations Summary and on Form HBM-1, Helibase Organization Chart.
4. Posting. A copy should be posted on the helibase display board.
5. Routing and filing. The AOBD should ensure that sufficient copies of the ICS-205 are made available for use by the Helibase Manager, Takeoff and Landing Coordinator, Radio Operator and Pilots.

   HINT: To lessen the amount of paperwork the Pilot must deal with in the cockpit, it is helpful if the AOBD requests that applicable aviation radio frequencies be incorporated into a corner of the Incident or Project Map that is distributed each day. This can be accomplished by writing out the frequencies and functions (for example, Air-to-Air 122.925) on a small piece of paper, taping it to the map, and making copies for the Pilot.

6. Related Forms. As stated, frequencies and their functions must match those on the ICS-220 Air Operations Summary and on Form HBM-1 Helibase Organization Chart.

Exhibit B- 10: Helibase Communications Plan (HBM-8)

Incident: ____________ **Helibase:** ____________ **Date:** ____________

Frequency Name	Receive	Transmit	Tone	Other Information
Local Unit Dispatch				
Air to Air Fixed Wing				
Air to Air Rotor Wing				
Air to Ground				
Command				
Tactical to Divisions				
Deck				
TOLC				
Helibase Flight Following				

HBM-8 (01/05) OPTIONAL

K. Helicopter Demobilization Information Sheet (HBM-9).

1. Purpose. The purpose is to enable the Helibase Manager to provide demobilization information on air and associated ground resources to the Planning Section so it may be relayed timely and accurately.

2. Applicability. The form is optional. It may be required by the Helibase Manager or air operations staff to facilitate timely transmittal of helicopter demobilization information.

3. Responsibility and Instructions For Completion. Refer to Exhibit B-10. The Helibase Manager and Helicopter Manager, along with the Pilot, are mutually responsible for completing the form when a decision to demobilize the resource has been made.

   Completion is self-explanatory. Update if travel routes and times change, or decision to hold the resource is made.

4. Posting. None.

5. Routing and Filing. Route the form to the Air Support Group Supervisor or Air Operations Branch Director, who is responsible for ensuring the information is relayed to the Planning Section.

6. Related Forms. None.

Exhibit B-11 Helicopter Demobilization Information Sheet (HBM-9)

Initial Request Information		Charge Code	Aircraft Information
Date	Time		FAA N#
			Flight Schedule Number
To	From		Make/Model
Mission Details			Color
			Vendor

Passenger and Cargo Information

Name/Cargo	Weight	Order #	DPT	DST	Name/Cargo	Weight	Order #	DPT	DST

Telephone Number

Pilots

Flight Itinerary

Departure							Arrival			Drop Off			Relayed
Date	PAX	Weight	Airport	ETD	ATD	ETE	Airport	ETA	ATA	PAX	Cargo	Key points	To/From

Flight Following

	FAA Flight Plan Filed
	Agency Flight Following
NICC Flight Following	1-800-994-6312
Home Unit Phone	

Radio Frequencies

UNIT	Transmit		Receive	
	Frequency	Tone	Frequency	Tone

Notes and Comments:

HBM-9A (01/05) OPTIONAL

L. Helicopter Flight Schedule (HBM-9A).

1. Purpose. The purpose is to enable the Helibase Manager to provide demobilization information on air and associated ground resources to the Planning Section so it may be relayed timely and accurately.

2. Applicability. The form is optional. It may be required by the Helibase Manager or air operations staff to facilitate timely transmittal of helicopter demobilization information.

3. Responsibility and Instructions For Completion. Refer to Exhibit B-11. The Helibase Manager and Helicopter Manager, along with the Pilot, are mutually responsible for completing the form when a decision to demobilize the resource has been made.

   Completion is self-explanatory. Update if travel routes and times change, or decision to hold the resource is made.

4. Posting. None.

5. Routing and Filing. Route the form to the Air Support Group Supervisor or Air Operations Branch Director, who is responsible for ensuring the information is relayed to the Planning Section and/or local dispatch center.

6. Related Forms. HBM-9A Helicopter Fight Schedule.

Exhibit B-12 Helicopter Flight Schedule (HBM-9A)

Initial Request Information		Charge Code	Aircraft Information
Date	Time		FAA N#
			Flight Schedule Number
To	From		Make/Model
Mission Details			Color
			Vendor

Passenger and Cargo Information

Name/Cargo	Weight	Order #	DPT	DST	Name/Cargo	Weight	Order #	DPT	DST

Telephone Number
Pilots

Flight Itinerary

Departure							Arrival			Drop Off			Relayed
Date	PAX	Weight	Airport	ETD	ATD	ETE	Airport	ETA	ATA	PAX	Cargo	Key points	To/From

Flight Following		
	FAA Flight Plan Filed	
	Agency Flight Following	
NICC Flight Following		1-800-994-6312
Home Unit Phone		

Radio Frequencies

UNIT	Transmit		Receive	
	Frequency	Tone	Frequency	Tone

Notes and Comments:

HBM-9A (01/05) OPTIONAL

M. Helibase Diagram (HBM-10).

1. Purpose. The purpose is to enable the Helibase Manager to brief Pilots and other personnel on the location of helibase facilities, touchdown pads, and flight routes inbound to and outbound from the helibase.

2. Applicability. The form is optional and should be completed by the second operational period on incident helibases or helispots to which two or more helicopters are assigned. On project helibases with two or more helicopters assigned, the form should be completed prior to the start of the first day's operations.

3. Responsibility and Instructions For Completion. Refer to Exhibit B-12. Also refer to Chapters 8 and 15 for further information.

   The Helibase Manager is responsible for completion. The Helibase Manager usually delegates this responsibility to the Takeoff and Landing Coordinator (TOLC) and the Deck Coordinator. Pilots should always be consulted concerning flight routes and location of facilities, landing pads, etc.

   The map should include, but is not limited to, the following:

   - Inbound/Outbound Flight routes
   - Location of all landing pads (designate as "personnel," "cargo" {both internal and sling/longline}, and "fueling")
   - Location of hazards on and around the helibase
   - Vehicle parking (fuelers, helibase personnel, crews, cargo)
   - Location of helibase operations and communications area

   The map should be updated as necessary (realignment of helibase, addition of landing pads, whenever locations change, facilities are added, etc.). An update date/ time should be indicated on the map.

4. Posting. The map is posted on the helibase display board as soon as it is completed.

5. Routing and Filing. Pilots should be briefed utilizing the latest map. No additional routing is necessary. The map becomes part of the helibase file.

6. Related Forms. The Incident Map showing helispot locations and incident area hazards is a separate map.

Exhibit B-13: Helibase Diagram (HBM-10)

Helibase:

Date:

HBM-10 (01/05) REQUIRED

N. Helibase Cumulative Cost Summary (HBM-11).

1. Purpose. The purpose is to ensure accurate cost tracking over the course of an incident or project.
2. The form is optional for fire and project use. Air operations staff should request its completion if required by them.
3. Responsibility and instructions for completion. The helibase manager is responsible for completing this form, but may be delegated to other helibase staff. Entries are made from the individual HBM-7 forms.
4. Posting. None
5. Routing and Filing. The form should become part of the Helibase documentation file on large fires, and give to the project manager for projects.
6. Related Forms. Forms HBM-7 Helibase Daily Use and Cost Summary.

Exhibit B-14: Helibase Cumulative Cost Summary (HBM-11)

Helibase: ______________________________

DATE	PAX	Cargo	Water	Retardant	Foam	F/T	Support	Total Cost
Totals								

HBM-11 (01/05) *OPTIONAL

O. Helitack Crew Performance Rating (HBM-12) and Helibase Personnel Performance Rating (HBM-13).

1. Purpose. Use to rate crews and single resources in performance of duties on the helibase.
2. Applicability. The forms are required on all incidents where an incident management team is assigned and optional on projects.
3. Responsibility and Instructions for Completion. The forms will be completed by the appropriate helibase supervisor.
4. Posting. None.
5. Routing and Filing. A copy should be mailed to the employees or crews home unit supervisor, and one copy kept for the fire package.
6. Related forms. None.

Exhibit B-15: Helitack Crew Performance Rating HBM-12.

Instructions: This rating is to be used only for determining an employees firefighting qualifications. Crew will be rated by the immediate supervisor, not the Crew Representative. If deficiencies are indicated for items 9 and 10 , explain in item 13.

1. Crew Name	2. Fire Name and Number	3. Managers Name

4. Crew Home Unit and Address	5. Agency Responsible for Fire

6. Incident Management Type	7. Helibase Type (1 or 2)	8. Dates on Incident
		to

9. Crew Evaluation

Rating Factors	Excellent	Satisfactory	Needs to Improve	Deficient
Physical Condition				
Attitude				
Team Work				
Off Line Conduct				
Use of Safe Practices				
Crew Organization and Equipment				
Helibase Operations				
10. Supervisory Performances				
Crew Supervisor				
Assistant Crew Supervisor				
Squad Leader(s)				
Senior Firefighter(s)				

11. Names Of Outstanding Workers

12. Names of Crewmembers needing Improvement	13. Areas Needing Improvement

14. Remarks

15. Crew Supervisor (signature): This rating has been discussed with me.	16. Date

17. Rated By (signature)	18. Incident Position	19. Home Unit Address	19. Date

HBM-12 (01/05) OPTIONAL

Exhibit B-16: Helibase Personnel Performance Rating HBM-13.

Instructions: This rating is to be used only for determining an employees firefighting qualifications. The immediate supervisor will rate each employee. If deficiencies are indicated, explain in item 10.

1. Name	**2. Fire Name and Number**
3. Home Unit Address	**4. Agency Responsible for the Fire**

5. Incident Position	**6. Dates on Incident** to	**7. Helibase Type**	**8. Incident Management Type**

9. Evaluation

Enter X under appropriate rating number and proper heading for each category listed.

0 - Deficient - Does not meet the minimum requirements of the individual statement. Deficiencies must be identified in remarks.

1 - Needs to Improve - Meets some or most of the requirements of the individual element. Identify improvement needed in remarks.

2 - Satisfactory - Employee meets all requirements of the individual element

3 - Superior - Employee consistently exceeds the performance requirements.

*** - Not Applicable**

Rating Factors	Helibase Gen				HECM / HESM				HCWN				ABRO / TOLC				DECK				HEB1 / HEB2			
	Qual / Trainee				Qual / Trainee				Qual / Trainee				Qual / Trainee				Qual / Trainee				Qual / Trainee			
	0	1	2	3	0	1	2	3	0	1	2	3	0	1	2	3	0	1	2	3	0	1	2	3
Knowledge of the job																								
Ability to obtain performance																								
Attitude																								
Decisions under stress																								
Initiative																								
Consideration for personal welfare																								
Obtain equipment and supplies																								
Physical ability for the job																								
Safety																								
Crash rescue																								
Other																								

10. Remarks

11. Crew Supervisor (signature): This rating has been discussed with me.	**12. Date**

13. Rated By (signature)	**14. Incident Position**	**15. Home Unit Address**	**16. Date**

HBM-13 (01/05) OPTIONAL

P. Two for One CWN Mgt and/or Standard to Limited Request (HBM-14).

1. Purpose. The purpose is to document authorization from the appropriate state or regional Aviation Manager to allow one manager to manage 2 Restricted category or limited use designated helicopters, or to allow a standard category helicopter to be designated for limited use. Refer to Chapter 2 for more information.
2. Applicability. The form is optional at all levels, but authorization by the Appropriate Aviation Manager must be documented.
3. Responsibility for Completion. The form must be completed by the AOBD, ASGS, Helibase Manager, Helicopter Manager, or local Aviation Manager.
4. Posting. The Authorization should be held by the requesting official until the request is no longer needed or is no longer valid.
5. Related Forms. None.

Exhibit B-17: Two For One CWN MGT. And/Or Standard to Limited Helicopter Request HBM-14.

Date of Request: ____________________

Agency/Unit: ____________________ **Incident Name:** ____________________

Requesting Official: ____________________ **Title:** ____________________

One Manager to be Assigned to 2 Restricted Category / Limited Use Helicopters

HCWN Name(1): ____________________ **Last day of HCWN assignment:** __________ **O- #** _____

1. Helicopter Make and Model: __________ **N- #** __________ **A- #** __________

2. Helicopter Make and Model: __________ **N- #** __________ **A- #** __________

Manager is fully qualified and agrees to manage both helicopters:	**Yes** _____	**No** _____
A second HCWN is on order with active efforts to fill (2):	**Yes** _____	**No** _____
The helicopters are located side by side at the same helibase:	**Yes** _____	**No** _____
A fully qualified Helibase Manager is assigned:	**Yes** _____	**No** _____

Standard Category Helicopter to be Designated as Limited Use (3)

Helicopter will be used for Buckets, External Cargo, ATGS, HLCO, PSD, IR, OR Aerial Mapping only: **Yes** _____ **No** _____

Rational:

____

Helicopter Make and Model: __________ **N- #** __________ **A- #** __________

Approved By: ____________________ **Title:** ____________________ **Date:** __________

Disapproved By: ____________________ **Title:** ____________________ **Date:** __________

Rescinded By: ____________________ **Title:** ____________________ **Date:** __________

(1) If either the Manager or Aircraft changes from the original request, a new approval will need to be obtained.

(2) Requestor will notify approving official when 2nd HCWN is filled.

(3) Requestor will notify approving official when helicopter is removed from limited use designation.

HBM-14 (01/05) OPTIONAL

Exhibit B-18: Recommended Helicopter Manager Items

Quantity	ITEM
1 Ea	Personal Portable programmable radio for air-to-ground communications
1 Ea	Adapter for AM Portable Radio
1 Ea	Flight Helmet with Bag
1 Ea	Goggles, Earplugs, Work Gloves
1 Ea	Aluminum Clipboard with Storage
1 Ea	Belt Weather Kit
1 Bk	Interagency Helicopter Operations Guide (IHOG)
1 Bk	Transportation of Hazardous Materials Handbook
1 Bk	Aviation Technical Assistance Telephone Directory
	IHOG HCM Forms (download from http://www.nwcg.gov)
1 Ea	IHOG Appendix F Daily Helicopter Operations Briefing/Debriefing Checklist
5 Ea	IHOG Appendix G Daily Helicopter Operations Briefing/Debriefing Checklist - Helibase Crew Reference
1 Ea	IHOG Appendix H Helibase Manager’s Reminders List
5 Ea	Passenger Aircraft Safety Briefing Cards
1 Bk	SF-288 Firefighter Time Report and SF-261 Crew Time Report
10 Ea	CA-1 Personal Injury Forms
1 Ea	Copy of the current National CWN Helicopter Contract
1 Ea	Copy of Appropriate Rental Agreement (if applicable)
1 Ea	USDA/USDI Aircraft Radio Communications and Frequency Guide
1 Ea	Aircraft Sectional Maps and Local Map Set
1 Bk	FS Cumulative Aircraft Use Summary
2 Ea	Notices of Non-Compliance
10 Ea	Flagging, filament tape, signal vest, signal mirror
1 Ea	Calculator, Clock, IDEA (yellow) pads, writing paper, pens and pencils
1 Ea	Cargo Net (if applicable)
1 Ea	Leadline (12 feet) (if vehicle available)
2 Ea	Swivel (if vehicle available)
1 Ea	Helicopter Support Kit (if vehicle available)

APPENDIX C - Emergency Response And Incident, Hazard, And Accident Reporting

I. Introduction.

Time is an extremely critical factor in responding to overdue, missing, or crashed aircraft. Personnel responsible for aircraft flight following cannot justify any delay in initiating emergency response procedures based on the possibility that a Pilot or Helicopter 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.

"SOMEONE'S LIFE MAY DEPEND ON YOUR ACTIONS."

II. Emergency Response Preparedness Plan.

A. Local Unit Responsibility.

Each local dispatch or other flight following office should have an Aircraft Accident Preparedness Plan or Aircraft Crash, Search and Rescue Guide. Information in this plan or guide on emergency response procedures should be pre-completed in the event of a mishap. This plan will be reviewed and updated annually or as needed.

1. **Purpose.**

   The purpose of the plan is to establish standard emergency response procedures that local line officers will follow in all cases when an aircraft meets applicable criteria of "Overdue," "Missing," or "Crashed".

2. **Applicability.**

   The plan will be used in situations where an aircraft meets overdue, missing, or crashed criteria.

3. **Contents.**

   Emergency response plans and guides may be formatted in a variety of ways, provided the user (that is, the individual making the initial response to the emergency) can easily reference the appropriate situation and then follow a generic checklist of actions to be taken for that situation.

B. Helibase Manager Responsibility.

Upon arrival at an incident or prior to commencement of a project, the Helibase Manager should acquire information from the local unit's emergency response plan and complete HJA-4, Crash Rescue/Medevac/Evacuation Plan, HJA-4A, Emergency Rescue Information. See Exhibits C-1, C-2, and C-3 for further information.

III. Emergency Response Procedures.

A "Mayday Call" indicates that the Pilot of an aircraft is experiencing an in-flight emergency. The Dispatcher or Aircraft Base Radio Operator must listen closely since the Pilot may be relaying location information essential to dispatch of rescue services.

A Dispatcher or Aircraft Base Radio Operator must always be on duty at the radio during mission-type flights. Helicopter personnel should also closely and continuously track the aircraft's location so that accurate location information can be relayed in an emergency.

After receiving a mayday call, the radio operator should attempt to contact the aircraft to determine the nature of the emergency. If the aircraft has landed safely and there is no need to order emergency services, then the responsible unit Aviation Manager or Helibase Manager should be contacted and appropriate action taken.

> IMPORTANT NOTE: During emergency situations involving an overdue, missing, or crashed aircraft, close coordination between the local unit dispatch office and the helibase is critical to the success of the search and rescue operation.

IV. 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, <u>but are not limited to,</u> such areas as:

- Deviations from policies, procedures, regulations and instructions as contained in Manual and Handbook Releases, Interim Directives, standard operating guides, etc.
- Hazardous materials handling and/or transport

- Flight following
- Deviation from planned operations, flight plan, type of use (for example, general to special-use)
- Failure to utilize personal protective equipment or Aviation Life Support Equipment (ALSE)
- Inadequate training, or failure to meet training requirements
- Failure to utilize load calculations and/or manifests correctly
- Weather conditions
- Ground operations
- Pilot procedures
- Fuel contamination
- Unsafe actions by Pilot, air crew, 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 not requiring 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. Note that the USFS also has a classification of "Incident With Potential" to cause an accident. Examples of incidents are:

a. Injury to Personnel. Injury requiring only 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 is classified as an incident or accident.

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 power plants and/or rotors are in operation and damage incurred requiring replacement or repair of rotors, propellers, tires, wheels, wing tips, flaps, etc., or an injury is incurred 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. Powerplants and/or rotors may or may not be in operation.

g. Near Mid-Air Collision. When airborne aircraft encroaches within 500 feet of another airborne aircraft, or a Pilot or crew member determines that a collision hazard existed between two or more aircraft.

4. Accident.

The accident definition is lengthy and fairly technical. If in doubt as to whether the occurrence was an incident ("Damage To Aircraft") or an accident, treat it as an accident. The investigation team will make the final determination as to classification.

B. Procedure for Using Agency Forms.

The agency with operational control of the aircraft at the time of the occurrence will complete a SAFECOM (incident/hazard form) and submit it through agency channels. Use Form OAS-34 (FS5700-14) for DOI or USFS incidents, or applicable state and local formats.

1. SAFECOM - Aviation Safety Communiqué OAS-34 /FS 5700-14. (See Exhibit C-1.)

The Aviation Safety Communiqué (SAFECOM) is a confidential safety reporting and feedback system for accident prevention. It is a tool used to encourage the reporting of any condition, observance, act, maintenance problem, or circumstance that has the potential to cause an aviation or aviation-related mishap. Data obtained from the system is monitored to identify emerging hazards, share critical safety information, document and track safety issues and identify training needs. It is also used for reporting positive safety actions and mishap prevention measures.

The SAFECOM system is not intended for initiating punitive or disciplinary actions and is not to be used for claims or contract evaluation /determination purposes. The goal of the SAFECOM system is to create a reporting culture that encourages open and honest reporting that improves the safety of aviation operations. SAFECOMs should be utilized in tailgate safety sessions, after action reviews, and briefings only after they have been properly managed through the system.

Submitting a SAFECOM is not a substitute for “on-the-spot” correction(s) to a safety concern. It is imperative that safety issues be addressed at the local level as well as being documented in a SAFECOM. SAFECOM managers at all levels may have additional corrective actions and input.

SAFECOM managers at all levels are responsible for protecting personal data and sanitizing SAFECOMs prior to any distribution and/or posting to the public. The SAFECOM system contains Personal Identifiable Information (PII) which is to be protected and safeguarded. In the event of an accident,dissemination of accident investigation information must be in accordance with NTSB law.

A SAFECOM does not replace the requirement for initiating a mishap report. Mishaps shall be reported immediately by the most expeditious means available in accordance with the bureau or agency Mishap Response Plan.

In order for SAFECOM’s to be effective as an accident prevention tool, they should be reported as soon as possible to the agency with operational control of the aircraft at the time of the event. SAFECOMs can be submitted online at www.safecom.gov or via phone at 888-464-7427. Hard copies of the OAS-34/FS-5700-14 form can be faxed to OAS at 208-433-5007; USFS at 208-387-5735 or submitted through the Unit/Forest Aviation Officer.

NOTE: Do not waste time trying to figure out if an event is an accident. If you have an event with an aircraft that results in damage or injury, no matter how slight, REPORT IT to DOI or USFS by calling 1-888-4MISHAP (888-4MISHAP).

2. State and Local Agency Reports.

Reference local formats. Federal personnel managing helibases or engaging in helicopter missions for state or local agencies should complete the state or local format. If none exists, complete a SAFECOM and submit it to the local unit Aviation Manager.

Exhibit C-1: SAFECOM Aviation Safety Communique OAS-34/FS 5700-14

Safety Communiqué Form

AMD-34 / FS 5700-14

SAFECOM
Aviation Safety Communique

REPORTED BY: (optional)

Name:
E-Mail:
Phone:
Cell Phone:
Pager:
Organization:
Organization Other:
Date Submitted: mm/dd/yyyy

EVENT

Date: mm/dd/yyyy	**Local Time:** hhmm	**Injuries:** Y/N	**Damage:** Y/N
State:	**Location:** (Airport, City. Lat/Long or Fire Name)		

Operational Control:
Agency:
Region:
Unit:

MISSION (* see look-up tables)

Type: *	Other:	
Procurement: *	Other:	
Persons Onboard:	Special Use: Y/N	Hazardous Materials: Y/N
Departure Point:	Destination	

AIRCRAFT (* see look-up tables)

Type: *	Tail #	Manufacturer:	Model:
Owner/Operator:		Pilot:	Manager:

NARRATIVE: (A brief explanation of the event)

CORRECTIVE ACTION: (What was done to correct the problem)

Exhibit C-1: SAFECOM Aviation Safety Communique OAS-34/FS 5700-14 (cont.)

SAFECOM FORM INSTRUCTIONS

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

These instructions and helpful hints are intended to make the process of submitting a SAFECOM as easy as possible. If you need assistance call the Forest Service at (208) 387-5285 or the Aviation Management Directorate, Aviation Safety at (208) 433-5070. After the completion and submission of your SAFECOM, your data will be stored in a central database that is shared on an interagency basis so you only have to submit one SAFECOM per event.

The **REPORTED BY section** is associated with the person submitting the SAFECOM. All of these fields are optional. However, this contact information is extremely helpful if it becomes necessary to follow-up with the submitter on a particular issue. This section asks for the name of the person reporting the event, their contact information and the organization they work for. If you choose to submit your name or any other information in this section, it will not appear on the SAFECOM that is available to the general public.

The **EVENT** section asks for the “when” and “where” in addition to damage or injuries. Enter the **Date** in the **mm/dd/yyyy** format, and then enter the **Time** using the 24-hour time format **hhmm.** Note that the date is a required field and both the date and time fields will only accept numeric characters. Were there any **Injuries**? **Yes** or **No**. If you select **Yes**, please explain in the narrative. Was there any **Damage**? **Yes** or **No**. If you select **Yes,** please explain in the narrative. The next field in this section is the **State**, which applies to the state where the event occurred. Note that the **State** field is a required entry. In the **Location** field enter the airport, name of the fire or latitude and longitude, township, range and quarter section are also acceptable. The next three fields identify the Agency, Region/State and the Unit that had operational control of the mission at the time of the event. These selections determine which organization(s) will receive initial notification that a SAFECOM has been entered into the database. Enter the Agency, Region/State and Unit. From www.safecom.gov these field have look-up tables to select the **Agency, Region, and unit from. Not all agencies have Region/State and Units listed at this time, so if none are listed, leave those fields blank.** See examples below:

Agency: Bureau of Land Mgt	**Region**: Alaska State Office	**Unit**: Glenallen FO
Agency: Forest Service	**Region**: Region 2	**Unit**: San Juan NF
Agency: NPS	Region:	Unit:

The **MISSION** section asks for information that describes the mission at the time of the event. In the **Type** field, use the look-up table to make a selection that best describes the mission that was being performed. Use the **Other** field if you need to further identify the mission or if

Exhibit C-1: SAFECOM Aviation Safety Communique OAS-34/FS 5700-14 (cont.)

nothing is available from the look-up table that actually describes the mission. In the **Procurement** Field, enter how the aircraft you were utilizing was procured from the look-up table. Use the **Other** field to further identify procurement if necessary. Under **Persons Onboard**, enter the total number of people on the aircraft, which includes the pilot(s), all flight crew personnel and passengers. Was the mission **Special Use, Yes** or **No?** Many of our missions are special use. In fact, almost all fire missions are considered special use as well as animal counting, herding, eradication, etc. Were there **Hazardous Materials** onboard, **Yes** or **No**? In **Departure Point**, enter where you departed from, an airport or helibase for example and under **Destination**, enter the intended destination, which could be an airport, fire name or helispot.

The **AIRCRAFT** Section generally applies to the aircraft you are utilizing. However, in the event of an airspace intrusion, conflict or near mid-air, enter as much information as possible about the other aircraft. If there are multiple aircraft involved, list the other aircraft in the narrative section. In the **Type** field, enter the aircraft type from the look-up table. In the **Tail #** field enter the tail number of the aircraft beginning with **N** for US Registered and **C** for Canadian Registered aircraft. Please do not enter the Tanker, Jumper or Helicopter number unless that is all you have. In the **Manufacturer** field, select the manufacturer from the look-up table. In the **Model** field, enter the model number without any spaces or hyphens for example, 206L3, DC6, PB4Y2. In the **Owner/Operator field**, enter the name of the agency if the aircraft is an agency fleet aircraft (i.e. USFS, USDI, etc.) or the name of the vendor operating the aircraft if it is contracted. In the **Pilot and Manager** fields enter the names, first name then last name.

In the **NARRATIVE** section give a brief description of the event with the facts and outcome of the event. Elaborate on any previous blocks above as necessary.

In the **CORRECTIVE ACTION** section give a brief description of the corrective action that was taken in an effort to prevent the event from reoccurring. Remember, submitting a SAFECOM is not a substitute for resolving the problem and taking on the spot corrective action. SAFECOMS are only for tracking and trending purposes.

Accidents and Incidents-With-Potential (IWP) must be reported immediately via the most expeditious method in accordance with the Interagency Aviation Mishap Response Plan. A SAFECOM should be completed later, but it is not to be used as an initial notification method.

Individuals are encouraged to submit their SAFECOM directly on-line at www.safecom.gov. If access is an issue, hard copy SAFECOMs are to be sent to the local Unit/Forest Aviation Officer, Regional/State Aviation Safety Manager, or National Offices of the DOI (fax 208-433-5007) or USFS (fax 208-387-5735).

SAFECOMs contain material subject to the Privacy Act of 1974, 5 U.S.C. Section 552a. Therefore, their contents must be protected. Individuals that submit SAFECOMs online may print a copy for their personal record, but are not to share or distribute any hard copy as it contains personal information. Dispatch Centers, Operational Bases, Incident Management Teams, Area Command, Air Operations, etc do not have authority to collect SAFECOMs from SAFECOM submitters. While it is imperative that operation managers are notified of safety issues immediately, this notification process does not include utilizing the SAFECOM system.

Exhibit C-1: SAFECOM Aviation Safety Communique OAS-34/FS 5700-14 (cont.)

MISSION – TYPE

Accident Investigation
Aerial Photography
Air Quality Monitoring
Cargo Letdown (Non-Fire)
Cargo Transport (Internal) (Non-Fire)
External Load (Belly Hook)
External Load (Longline)
Ferry/Repositioning Flight (Non-Fire)
Fire, Aerial Ignition
Fire, Aerial Ignition (Prescribed)
Fire, Air-Attack
Fire, Air-Attack (Prescribed)
Fire, Cargo Letdown
Fire, Cargo Transport (Internal)
Fire, Detection
Fire, External Load (Belly Hook)
Fire, External Load (Longline)
Fire, Ferry/Repositioning Flight
Fire, Helitack
Fire, Helitorch
Fire, Infrared Imagery
Fire, Initial Attack
Fire, Leadplane
Fire, Leadplane (Prescribed)
Fire, Medevac
Fire, Other
Fire, Paracargo
Fire, Passenger Transport
Fire, Ping-Pong Ball
Fire, Rappel
Fire, Reconnaissance
Fire, Retardant Drop (Airtanker)
Fire, Retardant Drop (Helicopter)
Fire, Retardant Drop (SEAT)
Fire, Smokejumper
Fire, Water Drop (Fixed-Wing)
Fire, Water Drop (Helicopter Bucket)
Fire, Water Drop (Helicopter Fixed-Tank)
Inspection (Aircraft)
Inspection (Pilot Evaluation)
Inspection (Unit)
Law Enforcement
Maintenance Test Flight
Medivac
Offshore
Other
Paracargo (Non-Fire)
Passenger Transport (Non-Fire)
Pipeline Patrol
Powerline Patrol
Rappel (Non-Fire)
Reconnaissance
Reconnaissance (Non-Fire)
Research
Search/Rescue
Seeding/Fertilization
Short Haul
Snow Survey
Spraying
Survey/Observation (Non-Fire)
Survey/ Forest Health Protection (Non-Fire)
Training (Aircrew)
Training (Helitack)
Training (Law Enforcement)
Training (Other)
Training (Pilot)
Training (Rappel)
Training (Smokejumper)
Wildlife/Animal Capturing
Wildlife/Animal Counting
Wildlife/Animal Eradication
Wildlife/Animal Herding
Wildlife/Animal Survey
Wildlife/Animal Tagging
Wildlife/Animal Tracking

MISSION – PROCUREMENT

Cooperator
CWN (Call When Needed)
End Product Contract
Exclusive Use Contract
Fleet
Military
Rental
Other/Unknown

AIRCRAFT - TYPE

Airplane
Airtanker (Multi-engine)
Airtanker (SEAT)
Helicopter
Helitanker
N/A

V. HJA-4 Crash Rescue/Medevac/Evacuation Plan

A. Purpose.

Provides procedures and protocols for crash rescue, medevac and helibase evacuation missions.

B. Applicability.

A Crash Rescue plan is required for all helibases and should be completed by the second operational period. Other versions of this plan may be used.

C. Responsibility and Instructions for Completion.

The Helibase Manager is responsibility for completing an incident specific plan it should also include the local crash rescue Plan, crash rescue diagrams from Appendix M, HJA-4A, and HJA –B. See Exhibit C-2.

Helibase personnel should be informed of information contained in this plan, and a crash rescue drill should be done as practical.

D. Routing and Filing.

The Helibase should retain a copy for the Helibase files, and a copy should be given to incident Medical Unit for familiarization.

E. Posting.

{Plan should be posted on Helibase Information Board or other conspicuous location

F. Related forms.

HJA-4A Emergency Rescue Information and HJA-4B Emergency Medevac/Medical Transport Request.

Exhibit C-2: HJA-4 Crash Rescue/Medevac/Evacuation Plan

Unit (Forest/District/Park/Reservation):	Initial Date and Time:
Fire Name:	**Fire Number:**
Helibase Name:	**Helibase Phone Number:**
Helibase Latitude:	**Helibase Longitude:**
Fixed Wing Base Name	**Fixed Wing Base Phone Number:**
Fixed Wing Base Latitude:	**Fixed Wing Base Longitude:**
Local Dispatch Center Name	**Local Dispatch Center Phone Number:**

The primary objective of the Helibase Medivac, Crash Rescue, and Evacuation Plan is to prevent the loss of life or property due to overdue, missing, or downed aircraft at or away from incident helibases and fixed wing bases. The intent of this plan is not to train personnel to respond to a fully involved aircraft fire. The intent is to train personnel to respond to small fires within their capability and training, and be able to rescue survivors of a crash in a safe, efficient manner.

Use of a Helibase Medivac, Crash Rescue, and Evacuation Plan is mandatory. This plan has been developed as a boiler plate from which location specific plans can be written.

HJA-4 (01/05) REQUIRED

CRASH RESCUE/MEDIVAC/EVACUATION PLAN

I. General Instructions

The Helibase, Medivac, Crash Rescue, and Evacuation Plan will utilize the local agency Crash Rescue Plan and IHOG Chapter 12 for planning and direction. A complete plan will be developed and implemented for the incident.

The Incident Management Team works for the host unit/agency. Once an aircraft is declared missing, the host unit/agency will activate its crash rescue plan.

The host unit/agency plan should be posted and discussed at the helibase, fixed wing base or Airtanker base briefing.

The success of this plan is based on planning, coordination, training and implementation by all personnel involved.

II. Crash Rescue Plan Checklist

_________ Is crash rescue equipment adequate to handle anticipated emergencies that may occur?
_________ Has the responsibility for the supervision of the Crash rescue activities been clearly defined?
_________ Are crash rescue personnel assigned specific duties?
_________ Can crash rescue equipment readily reach all portions of the air operations base area?
_________ Are air operations base personnel familiar with procedures pertaining to crash rescue activities?
_________ Have contacts and plans been made with cooperators for crash rescue assistance if needed?
_________ Are crash rescue personnel instructed on the importance of not unnecessarily disturbing the aircraft wreckage for accident investigation purposes?
_________ Are crash rescue personnel trained in first aid?

_________ Have provisions been made to launch an alert aircraft to the crash rescue scene for possible air evacuation?
_________ Are fire suppression crews instructed to standby while crash rescue helicopter is landing or taking off?
_________ Do air operations base personnel understand their specific duties?
_________ Are minimum levels of crash rescue training completed for assigned crews?
_________ Have the pilots been informed of the crash rescue plan?
_________ Are all air operations base personnel briefed on the plan?

III. Crash Rescue Crew Briefing

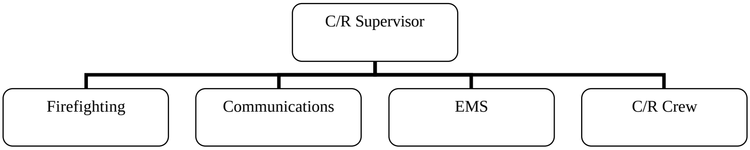
This Briefing should be conducted with the Crash rescue Crew and Helibase Manager or Deck Coordinator as soon as possible after arrival. The briefing should include the following:

Helibase layout including:
_________ Crash Rescue Crew Staging Area
_________ Pad layout
_________ Fueling areas
_________ Cargo and passenger staging and loading areas
_________ Emergency landing pad
_________ LCES
_________ Crash Rescue Crew roles and responsibilities
_________ Crash Rescue Plan
_________ Communications and frequencies
_________ Deck procedures
_________ Other Resources available in the area
_________ Medical Unit responsibilities at the Helibase

HJA-4 (01/05) REQUIRED

CRASH RESCUE/MEDIVAC/EVACUATION PLAN

IV. Air Operations Base Crash Rescue Organizational Chart



Assign primary personnel to each duty above in the organizational chart above and alternates below.

Crash Rescue Supervisor:	
Firefighting:	
Communications:	
EMS:	
Crash Rescue Crew:	

Air Operations Base-draw pads, traffic routes, location of fire extinguishers, hose lays, ARFF equipment, etc.

HJA-4 (01/05) REQUIRED

CRASH RESCUE/MEDIVAC/EVACUATION PLAN

V. Crash Rescue Duties and Responsibilities

All personnel are responsible for responding to small fires within their training and capability and to be able to rescue survivors in a safe and efficient manner. All personnel are responsible for ensuring that their position is filled if they are not available.

Crash Rescue Supervisor-generally should be the Deck Coordinator, Helibase Manager, Helicopter Manager, or Fixed Wing Base Manager.

Responsible for:

________ Safety of the Crash Rescue Crew, aircraft crew and passengers.
________ Supervise any crash rescue incident and provide crash rescue training to base personnel.
________ Ensure personnel involved with Firefighting, Communications, EMS, and Rescue positions know and understand their duties and responsibilities.
________ Prepare Crash Rescue Plan and post on base information board.
________ Daily briefing with assigned crash rescue crew.
________ Daily assignment of emergency response helicopter and backup aircraft.
________ Oversee preparation of fire extinguishers, crash rescue equipment, medical equipment on the helibase.
________ Develop and implement training exercise.

Firefighting - Usually assigned to Parking Tender or Aircraft Rescue/Firefighting Crew if one is assigned

Responsible for:

________ Preparedness of fire extinguishers or other suppression resources.
________ Knowing how to use suppression equipment in the event of an aircraft accident.

Communications-usually assigned to the ABRO, but may be assigned to ICP Communications.

Responsible for:

________ Establishing and maintaining clear and open radio or phone communication with ICP communications.
________ Ensuring only pertinent information is communicated.
________ Accurate documentation of times and events.

Emergency Medical Services-Usually assigned to an EMT from a helicopter module or an EMT/Paramedic assigned to the helibase from the Medical Unit.

Responsible for:

________ Preparedness of medical equipment on the base.
________ Maintaining response readiness by being briefed on all assigned aircraft and having PPE and equipment ready for a response.

Crash Rescue Crew-Assigned to base personnel familiar with aircraft and crash rescue and extraction equipment.

Responsible for:

________ Preparedness of the extraction equipment on the base.
________ Knowing how to properly use equipment in an aircraft crash situation.

HJA-4 (01/05) REQUIRED

CRASH RESCUE/MEDIVAC/EVACUATION PLAN

VI. Accident Response at Helibase

In the event of an accident at the helibase, the ABRO will announce on the Deck frequency that there has been an emergency and instruct all helibase personnel to hold non emergency traffic. The response will be managed by the designated Crash Rescue Supervisor. Only those designated on the Crash Rescue Organizational Chart will respond. All other personnel will remain at their assigned duty location unless requested to respond by the Helibase Manager or Crash Rescue Supervisor.

Once radio traffic has been secured, the Helibase will:

________ Dispatch the Crash rescue Module with a description and location of the incident.
________ Instruct all aircraft to land at the helibase or alternate landing area if needed.
________ Notify the Communications Unit of the emergency.
________ Relay resource needs, requests information from the response personnel to the Communications Unit.

The Crash Rescue Supervisor will:

________ Respond with the Crash Rescue crew and establish Command over the incident.
________ Remove all non-essential personnel from the incident scene.
________ Ensure the safety of responding personnel.
________ Initiate scene security measures as needed.
________ Communicate the needs of the rescue crew to the Helibase.
________ Begin the documentation process of the incident.

The designated Crash Rescue Crew will:

________ Conduct a scene size up.
________ Stabilize the scene.
________ Stabilize the aircraft.
________ Ensure aircraft Electrical system and fuel are shut off.
________ Triage patients.
________ Stabilize patients.
________ Extricate patients.

The assigned Emergency Medical Services will:

________ Meet face to face with the Crash Rescue Supervisor.
________ Determine transportation needs for patients.
________ Communicate transportation needs to Communications Unit so that arrangements can be made.
________ Coordinate patient care.
________ Package patients for transport.

Once all patients have been removed from the area:

________ The Crash Rescue Supervisor will conduct a final check for fuel leaks and ignition sources.
________ The Deck Coordinator will direct the removal of all non-essential personnel and secure the accident scene until law enforcement arrives.
________ All involved personnel and witnesses will complete a statement and turn them in to the helibase manager.

HJA-4 (01/05) REQUIRED

CRASH RESCUE/MEDIVAC/EVACUATION PLAN

VII. Accident Response Away from Helibase

In the event of an accident at the helibase, the ABRO will announce on the Deck frequency that there has been an emergency and instruct all helibase personnel to hold non emergency traffic. The response will be managed by the designated Crash Rescue Supervisor. Only those designated on the Crash Rescue Organizational Chart will respond. All other personnel will remain at their assigned duty location unless requested to respond by the Helibase Manager or Crash Rescue Supervisor.

Once radio traffic has been secured, the Helibase will:

________ Dispatch the Crash rescue Module with a description and location of the incident.
________ Instruct all aircraft to land at the helibase or alternate landing area if needed.
________ Notify the Communications Unit of the emergency.
________ Relay resource needs, requests information from the response personnel to the Communications Unit.

The Crash Rescue Supervisor will:

Assemble the Crash rescue Crew at the designate response aircraft and ensure that responding personnel:

________ Have been briefed on the aircraft.
________ Have all equipment to complete the mission.
________ Have a complete manifest that meets the aircraft allowable weight.
________ Have received a mission briefing that includes:

　________ Location of the incident.
　________ Details of the incident if available.
　________ Closest helispot and helispot limitations.
　________ Communications frequencies for ground contact, helispot, and helibase.
　________ Special needs.
　________ Concerns.
　________ Hazards.

The designated Crash Rescue Crew will:

________ Conduct a scene size up.
________ Stabilize the scene.
________ Stabilize the aircraft.
________ Ensure aircraft Electrical system and fuel are shut off.
________ Triage patients.
________ Stabilize patients.
________ Extricate patients.

The assigned Emergency Medical Services will:

________ Report to the Helibase and contact the Helibase Manager.

The Helibase Manager will ensure that the responding Emergency Medical Services personnel:

________ Have been briefed on the aircraft.
________ Have all equipment to complete the mission.
________ Have a complete manifest that meets the aircraft allowable weight.
________ Receive a mission briefing that includes:

　________ Location of the incident.
　________ Details of the incident if available.
　________ Closest helispot and helispot limitations.
　________ Communications frequencies for ground contact, helispot, and helibase.
　________ Special needs.
　________ Concerns.
　________ Hazards.

HJA-4 (01/05) REQUIRED

CRASH RESCUE/MEDIVAC/EVACUATION PLAN

The assigned Emergency Medical Services will:

________ Meet face to face with the on scene Incident Commander or Crash Rescue Supervisor.
________ Determine transportation needs for patients.
________ Communicate transportation needs to Communications Unit so that arrangements can be made.
________ Coordinate patient care.
________ Package patients for transport.

Once all patients have been removed from the area:

________ The Crash Rescue Supervisor will conduct a final check for fuel leaks and ignition sources.
________ The Deck Coordinator will direct the removal of all non-essential personnel and secure the accident scene until law enforcement arrives.
________ All involved personnel and witnesses will complete a statement and turn them in to the helibase manager.

HJA-4 (01/05) REQUIRED

CRASH RESCUE/MEDIVAC/EVACUATION PLAN

VIII. Helibase Medivac and Medical Transport Plan

Follow the same procedures for emergency and non-emergency missions. Remain calm and work step by step. Once the need for a Medivac or medical transport has been identified, the following steps will be taken.

Notification

_________ Communications will notify helibase of a Medivac or medical transport request.
_________ Helibase will confirm that Medical Unit personnel are responding to helibase and attempt to determine if the patient will be seated or supine.
_________ Helibase will notify Deck Coordinator and designated Medivac Helicopter Manager.
_________ Helibase will notify Air Attack of the mission.

Preparation

_________ The Medivac helicopter will be configured for the mission.

_________ Once medical personnel arrive a mission briefing by the Deck Coordinator will be done that includes the following:

- _________ Is the mission necessary?
- _________ Location of the patient-lat, long, helispot # etc.
- _________ Ground contact name and frequency.
- _________ Condition of the patient, is there an EMT on scene?
- _________ Destination of patient.
- _________ Special needs (litter, other equipment)
- _________ Do all responding personnel have tools and PPE as necessary?
- _________ Other aircraft in the area.
- _________ Known hazards.
- _________ Fire behavior at Medivac location.

Response

_________ Pilot, Helicopter Manager, and EMS personnel respond.
_________ Pilot and Helicopter Manager approve the helispot if necessary.
_________ Upon Landing, HEMG controls all movement around the aircraft until departure or shutdown.
_________ Helicopter Manager establishes and maintains communications with Helibase.
_________ EMS personnel will establish and maintain communications with the Medical Unit.
_________ Helicopter Manager assists as necessary.
_________ If seating in aircraft will not allow the helicopter to be transported with the patient, another helicopter will be dispatched to retrieve the helicopter Manager.
_________ Patient transport to helibase or medical facility.

Post incident action

_________ Biohazard will be cleaned from the helicopter by EMS personnel.
_________ All helibase personnel accounted for.
_________ Helicopter reconfigured for fire.
_________ After Action Report with all involved.

HJA-4 (01/05) REQUIRED

CRASH RESCUE/MEDIVAC/EVACUATION PLAN

IX. Night time Medivac Plan

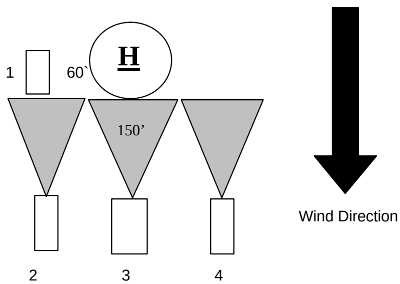
This Guide is intended to be used by Medical Unit personnel, for Life Flight or military Medivac aircraft after hours when fire aircraft cannot fly or helibase personnel are unavailable.

_________ Medical Unit will inform communications of possible Medivac.
_________ Medical unit determines transportations method and destination.
_________ Medical Unit informs Communications Unit of the need for Life Flight.
_________ Communications Unit Calls for Life Flight at: ________________________ Hospital, phone number.

Communications Unit relays the following information:

_________ Name and phone number of contact at the fire.
_________ Location of the fire.
_________ Location and condition of the patient.
_________ Location and condition of the helispot.
_________ Environmental conditions at the helispot.
_________ Information on other aircraft in the area.
_________ Radio frequencies (Medivac helicopter fm or am, incident air to ground, and incident air to air.)

Number 1 vehicle with patient no closer than 60' to the landing pad with only parking lights on
Number 2, 3, 4 vehicles no closer than 150 feet ft to landing pad with low beams on



HJA-4 (01/05) REQUIRED

CRASH RESCUE/MEDIVAC/EVACUATION PLAN

X. Helibase Burnover and Emergency Evacuation Plan

Plan 1

________ All aircraft not involved with suppression duties load w/ initial attack crews and relocate to alternate site.
________ Location Name: ________________________________
________ Latitude and Longitude: ________________________________
________ Flight Following Dispatch Center: ________________________________
________ Frequencies and tone: ________________________________
________ No Vehicles will be moved in the event of a nighttime burnover
________ All persons assemble with their module.
________ If the fire behavior allows move around the safety area to minimize exposure to heat and gasses.
________ Assist with burnout and holding as instructed by the helibase manager.

Plan 2

________ All aircraft not involved with suppression duties load w/ initial attack crews and relocate to alternate site.
________ Location Name: ________________________________
________ Latitude and Longitude: ________________________________
________ Flight Following Dispatch Center: ________________________________
________ Frequencies and tone: ________________________________
________ Fuel trucks move to: ________________________________
________ All helibase personnel load into vehicles (4 wheel drive only if off road egress is necessary).

Form a line of vehicles at the helibase entrance in the following order:

________ Pads by numerical order
________ Water Tender
________ Cargo Crew
________ Crash Rescue Engine
________ Helibase command personnel

________ Relocate as directed by the Helibase Manager

Attachments

1 Appropriate Crash Rescue Diagrams from IHOG Appendix M
2 Helibase Emergency Rescue Information (HJA-5A)
3 Emergency Helicopter Medivac/Medical Transport Request (HJA-5B)
4 Local Dispatch Crash Rescue Plan

HJA-4 (01/05) REQUIRED

VI. Emergency Rescue Information (HJA-4A).

A. Purpose.

The purpose is to identify primary and secondary medevac helicopters in the event of injuries to personnel or in the event of an aircraft mishap and the locations of medical facilities.

B. Applicability.

The form is required and must be completed by the second operational period on incident helibases or helispots to which two or more helicopters are assigned. On project helibases with two or more helicopters assigned, the form must be implemented prior to the start of the first day's operations.

C. Responsibility and Instructions For Completion.

The Helibase Manager is responsible for ensuring the form is completed and for reviewing the Plan on a daily basis during pre-operations briefings.

Most information is available from the local unit dispatch office. Completion of the form is self-explanatory. Update the form as aircraft assignments change. Refer to Chapters 12 and 17 for additional information.

D. Posting.

The form is posted on the helibase display board.

E. Routing and Filing.

The form becomes part of the Incident Crash Rescue Plan.

F. Related Forms.

Form HJA-4, Crash Rescue/Medevac/Evacuation Plan, and HJA-4BB, Emergency Medevac/ Medical Transport Request.

The purpose is to provide additional information which is not on a Resource Order or other dispatch request but which is necessary to respond safely and efficiently to a request for Helicopter Emergency Medical Services (EMS) services.

Exhibit C-3: HJA-4A Emergency Rescue Information

Dedicated Medivac And Medical Transport Aircraft

Aircraft N#	Make / Model	Helicopter Manager	Litter / Rappel / Extraction / Short-Haul Capability	Assigned EMT	Remarks or Other Information

Medical Facility Information

Facility Name	Facility Capabilities (ICU, Burn Unit ,Cardiac Unit Etc)	Geographic Location	Latitude	Longitude	VOR	NM	DEG	Est. FT	Contact Freq.	Remarks

Air Ambulance / Life Flight Information

Helicopter Life Flight Facility Located At	Aircraft Type	Phone Number	Contact frequency	Remarks

HJA-4A (01/05) REQUIRED

XII. Emergency Medevac/Medical Transport Request (HJA-4B)

A. Purpose.

B. Applicability.

The form is optional but should be used for all requests for helicopter emergency medical services (EMS), including “life flight” helicopters and incident helicopters assigned to medevac missions. Completion is not required for medevac transport from established helispots or the helibase.

C. Responsibility and Instructions For Completion.

Refer to Exhibit B-17. The Helibase Manager is responsible for ensuring the form is completed when requests for such services are received. This responsibility is usually delegated to the Aircraft Base Radio Operator.

Ensure that as much information is completed as is possible or available. Particular attention should be paid to radio frequencies, particular with “life flight” helicopters, and to the availability of fuel either enroute to the scene or to the medical facility. Completion of specific blocks on the form is self-explanatory.

D. Posting.

None.

E. Routing and Filing.

The form becomes part of the Incident Crash Rescue Plan.

F. Related Forms.

HJA-4 Crash Rescue/Medevac/Evacuation Plan, and HJA-4A Emergency Rescue Information.

Exhibit C-4: Emergency Medevac/Medical Transport Request (HJA-4B)

Injury Information

Medivac (Life Threatening) _____ **Medical Transport** _____

Injury Information

Number of patients to be transported ____________________
Is patient able to walk? ____________________
Explanation (Vitals, type and extent of injury, ETC)
____
____
____

Incident Site Information

Agency ____________________
Location of helispot
Township _______ **Range** _______ **Section** _______ **1/4 section** _______

Latitude _______________ **Longitude** _______________

VOR _______________ **Distance** _______________ **Bearing** _______________

Is Helispot Complete _______________ **If Not, How long to Completion?** _______________

Conditions of helispot
Wind speed _______________ **Direction** _______________ **Temperature** _______________

Elevation (MSL) _______________ **Visibility** _______________ **Helispot size** _______________

Terrain factors ____________________

Other Aircraft in the area:
Aircraft # ____________________
Aircraft # ____________________
Aircraft # ____________________
Aircraft # ____________________

Radio Frequency Information

Helispot Frequency ____________________
Incident Frequencies ____________________
Air to Air ____________________
Air to Ground ____________________
Administrative Unit Frequency ____________________
Other Frequency ____________________

Ground Contact Information ____________________
Contact Person at the Helispot ____________________
Is there a qualified helitack person on site? ____________________
Proximity of helispot to injury site? ____________________
Contact person with injured party and radio frequency ____________________

HJA-4B (01/05) *OPTIONAL

APPENDIX D - Contract Administration; Agency Flight Payment Documents

I. Contract Administration.

A. Introduction.

Administration of an aircraft contract is a joint responsibility of the unit for which the aircraft has been procured and the office with contracting authority, with ultimate responsibility vested in the Contracting Officer. Administrative functions are generally delegated to the local unit level.

One party to any government aircraft contract is the United States of America, the sovereign political entity on behalf of which the contract is entered into.

All persons involved in making and administering U.S. government contracts act solely as agents of the United States, commonly called Contracting Officers (COs), and have only the authority delegated to them.

B. Contract File.

Contracting Officer's Representatives (COR) and Project Inspectors (PI) should maintain a contract file. At a minimum, this file should consist of:

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

C. Types of Contracts and Ordering Agreements.

1. Exclusive Use Contract. Exclusive use contracts are those awarded for a specific time period. During this time period the government has exclusive use of the helicopter. The government may, at its option, release the helicopter for other work for a specified period of time.
2. National Call-When-Needed Contract. USFS and OAS jointly award a national contract for Type 1 and 2 helicopters. Vendors are not required to respond unless they accept an order to provide services.

3. Type 3 Call-When-Needed Contracts. USFS units (e.g., forests or regions) award Type 3 Call-When-Needed Contracts. Vendors are not required to respond unless they accept an order to provide services.
4. On-Call Contracts. OAS awards On-Call Contracts for use on projects as well as fire. Vendors are not required to respond unless they accept and order to provide services.
5. Aircraft Rental Agreements. OAS establishes these ordering agreements with terms that are negotiated between OAS and various vendors. Once a vendor is hired, they are bound by the terms of the agreement. Vendors are not required to respond unless they accept an order to provide services.

D. Authority of Government Personnel.

Before any person takes an action on behalf of the United States, he/she needs to ascertain whether authority to take the action has been given.

E. Disputes with Vendors.

Disputes that cannot be readily resolved at the local level by the PI/COR/COAR should be referred to the CO.

F. Generic Duties and Responsibilities of Contracting Personnel.

1. Contracting Officer (CO) or Administrative Contracting Officer (ACO). The CO or ACO (USFS) is responsible for all contracting actions including contracting procedures and methods, contract legality, compliance with existing laws and regulations, contract administration and terminations. The CO may delegate certain contract functions. In the contract administration function, decisions on claims and disputes are final, appealable only to the Board of Contract Appeals or Court of Claims.

   NOTE: The CO or ACO is the only individual who may modify or change a contract.

   a. USFS. For all national contracts, the ACO is located in Boise, ID. For other aviation contracts, the ACO is located in the Regional Office.
   b. OAS. For all aviation contracts, the CO is located in Boise, ID or Anchorage, AK.
2. Contracting Officer’s Technical Representative (COTR). The COTR is directly responsible to the Contracting Officer for assuring compliance with the technical provisions of the contract. The COTR conducts initial inspections and approves the vendor’s equipment, facilities, and personnel prior to, and periodically during, contract performance. The COTR may discuss changes or modifications in equipment or other requirements of the contract, but may not commit the Government to such changes, modifications, or adjustments without going through the CO.
   a. USFS. For all national contracts, the COTR is located in Boise, ID. For other contracts, the COTR may be located in the Regional Office.

b. OAS. For all aviation contracts, the COTR is located in Boise, ID or Anchorage, AK.

3. Contracting Officer's Representative (COR). The COR is directly responsible to the CO for monitoring contract performance. The COR is primarily responsible for assuring compliance with the administrative provisions of the contract. The COR maintains communications with the vendor concerning day-to-day operations, though this may be further delegated to a Project Inspector. The COR may represent the CO in making minor allowances which do not modify the price, or other provisions of the contract. The COR is responsible for verifying the work performed upon which payment is based. The COR may recommend to the CO proposed changes and adjustments to the contract in order to meet the demands of the work. The COR may discuss changes or modifications in equipment or other requirements of the contract, but may not commit the Government to such changes, modifications, or adjustments without going through the CO.

a. USFS. For all national contracts, the COR is assigned at the Agency's option. For other contracts, the COR may be the Helicopter Manager.

b. OAS. For all aviation contracts (except the National CWN contract), and unless otherwise stated by agreement, the COR is assigned at the Bureau's or Office's option. For example, the State Aviation Manager in the Bureau of Land Management is usually the COR. For the National CWN contract, the CO-Project Inspector relationship is direct, with no COR assigned.

4. Project Inspector (PI). The PI is designated by the COR to assist in implementing the COR's instructions, as required. Responsibilities of the PI may include:

- Verifying services performed by the vendor.
- Ensuring vendor's compliance with contract specifications and provisions.
- Discussing daily work requirements and ordering service within the contract provisions.
- Discussing problems which occur with the vendor and recommending solutions to the COR.
- Completing Form HCM-1, Aircraft Contract Daily Diary. Any problems of a serious nature are brought immediately to the attention of the COR and CO.

a. USFS. For all national contacts, the Helicopter Manager is the PI. For other contracts, the Helicopter Manager may be the PI.

b. OAS. For all aviation contracts, unless otherwise stated by agreement, the PI is assigned at the Bureau's or Office's option. For example, both the District Aviation Manager and the Exclusive-Use Helicopter Manager in the Bureau of Land Management may have Project Inspector duties.

Exhibit D-1: OAS Contract Administration Organization

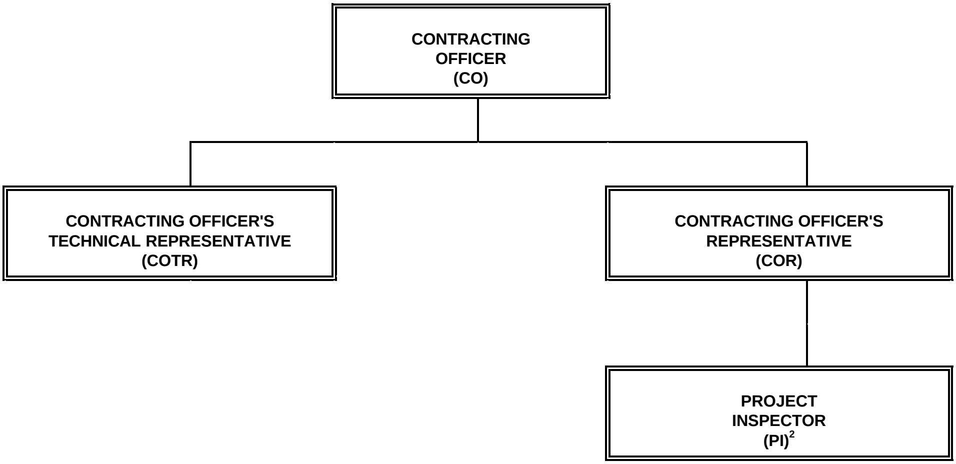
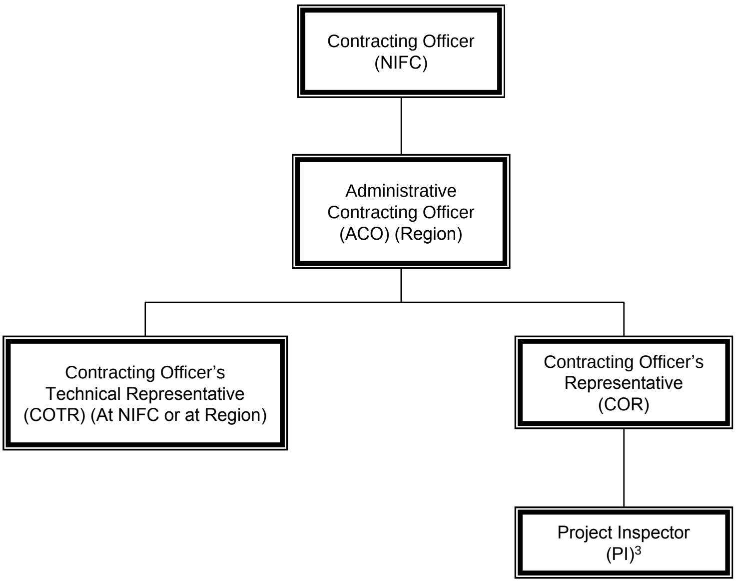


Exhibit D-2: USFS Contract Administration Organization



II. Flight Payment Forms and Instructions.

The proper completion of flight payment documents is essential to the correct, timely payment of vendors.

To meet OMB Circular A-123, Internal Control Review, and OMB Circular A-126, Improving The Management and Use of Government Aircraft, close attention should be paid to the processes and procedures outlined in Appendix A, Helicopter Management Forms and Checklists, and to the instructions contained in this appendix.

A. Services Ordered and Received by the US Forest Service

1. All flight time, daily availability and other authorized charges or deductions shall be recorded on a Flight Use Report in Aviation Business System (ABS). At the end of each day data shall be entered and reviewed by the Government and the Contractor's Representative.
2. Approved invoices will be packaged electronically for payment on a semi-monthly basis for submission through the ABS process and electronically forwarded to the contractor for review and approval. Corrections shall be returned electronically to the designated representative for resolution. Upon approval, the package will be electronically forwarded to the Albuquerque Service Center (ASC) for payment.

   Invoices accumulated during the first half of the month will be processed for payment about the 15th and those accumulated during the last of the month will be processed about the 1st of the following month.

   Go to http://www.fs.fed.us/business/abs "Getting Started" for instructions and more information.

B. Services Ordered and Received by OAS.

1. Vendors shall make electronic payment invoice requests through a controlled electronic invoice and reporting system. All flight time, daily availability and other authorized charges or deductions shall be recorded on an OAS23e. A copy, signed by the Pilot and Government Representative, of the 23e is submitted to the vendor for uploading to the Aviation Management System (AMS). Supporting invoices and/or documentation shall be attached electronically to the report.
2. Payment invoices are to be submitted no sooner than every two weeks or upon conclusion of a project.

APPENDIX E: HELITACK CREW AND HELIBASE PREPAREDNESS REVIEW

I. Introduction.

An evaluation of exclusive use helicopter crews and designated helibases should be conducted as part of pre-season readiness. The local unit should have adequate time, as identified by the evaluators, to respond to the evaluation and to identify corrective action planned or already taken.

II. Purpose.

The purpose of the Helitack Crew and Helibase Preparedness Review is to evaluate the general readiness of the helicopter module and identify and correct any safety or operational deficiencies related to the helicopter base or crew. It should be stressed that the evaluation process is meant to be a constructive process.

III. Applicability.

The format as contained in the Helitack Crew and Helibase Preparedness Review is optional. However, individual agency manual or handbook direction may require completion through reference to the IHOG. If used, it should be completed for all contract helicopters and crews stationed at permanent helibases.

You will need to have the following items for the review:

Checklist Item #	Documentation	Checklist Item #	Documentation
D1	Helicopter/Helibase Operations Plan	L5	Documentation for listed items
D1	Unit Aviation Plan	L7	Documentation for listed items
E10	Latest Safety Inspection documentation	L9	CDL license for drivers (where applicable)
K1-K2	Documentation for listed items	L11	Job Hazard Analysis (JHA's)
L4	Red Card for each employee	L11	Documentation of Tailgate Safety Sessions
L5	IDP for each employee		

IV. Responsibility and Instructions for Completion.

Aviation management at the Regional, State, or Area level is responsible for facilitating the evaluation. Conducting the evaluation can be delegated to the unit Aviation Manager. Annual evaluations are recommended. The crew and vendor should be allowed sufficient time (for example, 1-2 weeks) between contract start and the evaluation.

Completion of individual items is self-explanatory. The following is recommended as an overall approach:

- □ The Helitack Manager should use the evaluation as a checklist to prepare for the visit by the team. It can also be used for self-evaluation throughout the season.

- □ In order to cover all functional areas in a reasonable amount of time, it is recommended that each member of the evaluation team cover a separate functional area, with others on the team concurrently completing their assigned area.

- □ A closeout with local fire and aviation management personnel, to review positive aspects of the evaluation as well as deficiencies, is essential. The evaluation team should follow this up with written documentation to the local Line Officer.

- □ A follow-up, either formal or informal, should be made to ensure corrective action has been taken to rectify deficiencies.

V. Routing and Filing.

Formal submission to the local Line Officer is recommended, with follow-up reply from the local unit as to corrective actions planned or already taken. Regional, State or Area aviation management should keep past evaluations on file in order to ensure that items identified in previous visits have been addressed.

IHOG APPENDIX E - HELITACK CREW AND HELIBASE PREPAREDNESS REVIEW TEAM CONDUCTING THIS EVALUATION

NAME	AGENCY	PHONE

IMPORTANT NOTE: It is recommended that Section L, Helitack Crew, be addressed LAST in the evaluation. During the course of the inspection, items addressed in other sections will provide much of the information needed to make the evaluation of personnel.

The following additional sheets are available on the electronic version of this checklist:

IHOG APPENDIX E - HELITACK CREW AND HELIBASE PREPAREDNESS REVIEW

A. GENERAL INFORMATION

Base Name:	Agency/Unit:
Geographic Location:	
Phone Number(s):	
Mailing Address:	
Latitude:	Longitude:
TWN: RGE: SEC:	VOR: Radial: Distance: NM
Elevation: Average Midsummer Day Temp:	Density Altitude:
Capable of accommodating how many helicopters: TY 1:	TY 2: TY 3:
Is the Helibase located at an airport: ☐ YES ☐ NO FAA Designator (if applicable): Agency Designator:	Contract COR: Contract PI(s):

Position	Name	Tour	Position	Name	Tour

Company Name:	Company Phone:
Address:	
Pilot Name:	Local Phone Number:
Relief Pilot Name:	Local Phone Number:
Mechanic name:	Local Phone Number:
Relief Mechanic Name:	Local Phone Number:
Driver Name:	Local Phone Number:
Relief Driver Name:	Local Phone Number:

Additional Information

IHOG APPENDIX E - HELITACK CREW AND HELIBASE PREPAREDNESS REVIEW

B. HELIBASE LOCATION AND LANDING AREA

CODE KEY: E = EXCEEDS STANDARD M = MEETS STANDARD NI = NEEDS IMPROVEMENT NR = NOT REVIEWED

DESCRIPTION	CODE	REMARKS
1) Location (Indicate any problems with)		
a) Size and layout of facility		
b) Vehicle access		
c) Touchdown Pad(s) or pad surface		
d) Surrounding topography		
e) Approach/Departure Paths meet Agency standard		
f) Visibility of arriving and departing aircraft		
g) Fuel Truck and vehicle parking		
2) Wind Indicator(s) properly placed		
3) Foreign Object Damage (FOD) and Dust Control Measures in place		
4) Warning signs posted appropriately		
a) No Smoking		
b) Hazardous Areas		
c) Hazardous Materials Storage		
d) Authorized Parking		
e) Deck Security		
f) Designating Restricted Areas		
5) Is DECK fenced and/or can it be secured		
a) Overall adequacy of security		
6) Vendor fueling procedures (Ask for demonstration and to see Vendor's Fuel Servicing Vehicle Record)		
7) Auxiliary Fuel Storage (If Applicable). Ask to see Aircraft Fuel Facility Inspection Log (Form HCM-3)		
a) Capacity		
b) Type fuel stored		
c) Transfer facilities		
d) Ground reels		
e) Adequate Spill Containment		
f) Condition and storage of pumping equipment		
8) Crash-Rescue and Evacuation Kits readily available at the landing area		
9) First-Aid Kit readily available at the landing area		
a) Is the kit well maintained		
b) Date of last inspection		
10) Adequate lighting for night operations (if applicable)		
11) Fire Extinguishers		
a) Number		
b) Type fuel stored		
c) Capacity		
d) Condition		

IHOG APPENDIX E - HELITACK CREW AND HELIBASE PREPAREDNESS REVIEW

B. HELIBASE LOCATION AND LANDING AREA (continued)

CODE KEY: E = EXCEEDS STANDARD	M = MEETS STANDARD	NI = NEEDS IMPROVEMENT	NR = NOT REVIEWED
DESCRIPTION	**CODE**	**REMARKS**	
11) Fire Extinguishers (continued)			
e) Date(s) of last inspection			
f) Extinguishers of proper type and current inspection			
g) Appropriate Fire Extinguishers available at each landing pad			
12) Electrical equipment properly grounded			
13) Water available at Pad(s) for Aircraft Wash Down			

Additional Information

IHOG APPENDIX E - HELITACK CREW AND HELIBASE PREPAREDNESS REVIEW

C. BASE FACILITIES AND COMMUNICATIONS

CODE KEY: E = EXCEEDS STANDARD M = MEETS STANDARD NI = NEEDS IMPROVEMENT NR = NOT REVIEWED

DESCRIPTION	CODE	REMARKS
1) Does base have backup Auxiliary Power System		
2) Local-Area Communications Plan posted in both the Office and Ready Room		
a) Are frequencies posted on this plan		
b) Does Base have a Public Address system		
3) Helibase radio operations meet Agency requirements of:		
a) A permanent programmable FM radio Base Station		
b) At a minimum, handheld VHF-AM equipment		
c) Minimum number of handheld radios for the crew		
d) Knowledge of radio programming		
e) Understanding frequency authorization and use issues		
f) Facility radio and speaker system		
g) Appropriate, authorized frequencies assigned and posted		
4) Telephone System adequate for the activity at the Base (numbers of lines for phones, FAX, computers)		
a) Phones in working order		
b) Instructions for use of Phone/Computer System posted, including Vendor use of federal telephone/computer system		
c) Appropriate phone numbers (Dispatch, Crash-Rescue, FBO, etc.) clearly posted		
d) Does Base have adequate computer access for information gathering and operations		
5) First-Aid Kit available and in good condition		
a) Date of last inspection		
6) Office equipment and furniture in acceptable condition		
7) Condition and adequacy of Crew Overnight Quarters (if applicable)		
8) Condition and adequacy of Pilot and Crew Ready Room/Standby Area		
a) Air conditioning		
b) Hot and cold potable water		
c) Rest room facilities		
d) Lighting		
e) Desk(s)		
f) Eating facilities		
g) Refrigerator		
h) Heating		
i) Shower		
J) Lounge area		
k) Lockers		
l) Flight Planning area		
m) Stove/microwave		

IHOG APPENDIX E - HELITACK CREW AND HELIBASE PREPAREDNESS REVIEW

C. BASE FACILITIES AND COMMUNICATIONS

CODE KEY: E = EXCEEDS STANDARD M = MEETS STANDARD NI = NEEDS IMPROVEMENT NR = NOT REVIEWED		
DESCRIPTION	**CODE**	**REMARKS**
9) Safety equipment (1st Aid Kits, smoke alarms, fire extinguishers)		
10) Does the Base Office have adequate space (Office and Standby) for the number of personnel working there for the intended purpose		
11) Office well organized (materials and references accessible and labeled, etc.)		
12) Security for Personnel Records		

Additional Information

IHOG APPENDIX E - HELITACK CREW AND HELIBASE PREPAREDNESS REVIEW

D. PLANNING AND ADMINISTRATION

CODE KEY: E = EXCEEDS STANDARD M = MEETS STANDARD NI = NEEDS IMPROVEMENT NR = NOT REVIEWED

DESCRIPTION	CODE	REMARKS
1) Helicopter/Helibase Operations and Unit Aviation Plan		
a) Helicopter/Helibase Operations Plan is current, available and follows IHOG standard		
b) Is the Unit Aviation Plan current and available		
c) Has the Crew and the Pilot been briefed on the contents of the Helicopter/Helibase Operations Plan and Unit Aviation Plan		
d) Are both plans readily available to other crews in regular Helicopter Crew's absence		
2) Does the Base Operations Plan depict or discuss the following		
a) A current organization chart for the base		
b) Aircraft contract administration procedures		
c) A current organization chart for the dispatch organization		
d) A current communications plan for phone and radio use		
e) A map of the local area with prominent landmarks		
f) A map with zones of influence, exchange, and initial attack areas		
g) A map of current detection flight routes		
h) A map with local airfield hazards		
i) Local airfield management (procedures/regulations)		
j) Local fuel vendor		
k) A road map of local area		
l) A list of local lodging and eating facilities		
m) Fuels and fire behavior common to the area		
n) Agency responsibilities (especially at interagency bases)		
o) Duties and responsibilities of base personnel		
p) Timekeeping procedures		
q) Use of forms and reports		
r) Pilot standby/availability and dispatch requirements		
s) Procedures for submission of payment documents		
t) Base electrical system (normal and emergency)		
u) Maintenance of base facilities and equipment		
v) Wash down, draining, and spill procedures		
w) Helicopter parking areas and procedures		
x) Fueling areas and procedures		
y) Flight plan and flight following procedures (Local, Geographic Area, and National)		
z) Airspace coordination (local procedures for Temporary Flight Restrictions (FAR 91.137), Special-Use Airspace (MOA's, etc.) And Military Training Routes)		
aa) Location of additional Personal Protective Equipment		
bb) Local crash-rescue organization and procedures		
cc) Hazard, incident, and accident reporting		
dd) Local procedures for payment of landing fees and airport use costs (If Applicable)		
ee) Use of night lighting equipment		

IHOG APPENDIX E - HELITACK CREW AND HELIBASE PREPAREDNESS REVIEW

D. PLANNING AND ADMINISTRATION (Continued)

CODE KEY: E = EXCEEDS STANDARD M = MEETS STANDARD NI = NEEDS IMPROVEMENT NR = NOT REVIEWED

DESCRIPTION	CODE	REMARKS
3) Are the following references available at the Base		
a) Agency Aviation Management Manuals/Handbooks		
b) NFPA 407 Standard for Aircraft Fuel Servicing		
c) Aviation Transport Of Hazardous Materials Handbook		
d) Interagency Helicopter Operations Guide		
e) Interagency Aerial Ignition Guide		
f) Interagency Airspace Coordination Guide		
g) Interagency Helicopter Rappel Guide (if applicable)		
h) Interagency Helicopter Short-Haul Guide (if applicable)		
i) Agency Contract Administration Manual or Guide		
j) Health and Safety Codes for appropriate Agency		
k) Current Aviation Contract for each assigned aircraft		
l) Aircraft Communications Plan and Frequency Guide		
m) Geographic Area Mobilization Guide and local plans from appropriate agencies		
n) Aircraft Emergency Response Plan		
o) Helicopter Crewmember Training Material		
p) Aircraft Performance and Power Check Charts		
q) Sunrise/Sunset/Civil Twilight Charts for area of local response		
r) Job Task Books as appropriate		
s) Interagency Standards for Fire and Aviation Operations (Redbook)		
4) Vendor and Helitack personnel aware of policy concerning transportation of Vendor personnel in government vehicles		
5) Have timekeeping procedures been established, reviewed with Helitack and Vendor personnel, and are they adequate to ensure accuracy		
6) Duty Roster and schedules posted		
7) Aircraft Payment Forms completed correctly (check past copies)		
8) Helicopter Managers aware of IHOG Required Forms submission on Type I and II Incidents		
9) Contract Daily Diaries (HCM-1) completed with adequate documentation		
10) Pilot Flight and Duty Hours current and posted (HCM-12)		

Additional Information

IHOG APPENDIX E - HELITACK CREW AND HELIBASE PREPAREDNESS REVIEW

E. SAFETY AND TRAINING

CODE KEY: E = EXCEEDS STANDARD M = MEETS STANDARD NI = NEEDS IMPROVEMENT NR = NOT REVIEWED

DESCRIPTION	CODE	REMARKS
1) Frequency of Safety Meetings		
a) Safety Meetings documented		
2) Safety Bulletin Board established, current/useful information posted		
a) Unit and Helitack Crew Organizational Charts		
b) Emergency Notification Procedures		
c) 10 Standard Fire Orders, 18 Watch Out Situations, LCES		
d) Facility Fire Plan		
e) Fire danger information		
f) Fire weather information		
g) Fire Danger Rating Pocket Card		
h) Smoking Policy		
i) Sexual Harassment Policy/EEO Counselors		
j) Material Safety Data Sheet (MSDS) location		
3) Helitack and Vendor personnel familiar with SAFECOM reporting system procedures		
a) Are Hazards/Incidents being properly documented and submitted using SAFECOM's		
4) Overall Safety Attitude of:		
a) Helitack Crew		
b) Vendor Personnel		
5) Has a Crew Training Plan been established to meet Agency requirements		
6) Has training been conducted and documented in the Transportation of Hazardous Materials (A-110)		
7) Has a Physical Fitness Training Program been established		
a) Is it adequate to the needs of an initial attack crew		
8) Local map of Known Flight Hazards posted		
a) Hazard Map accessible to both Helitack Crew and Pilot(s)		
b) Has the map been updated		
c) Date of last revision		
d) Is there a key on the map that identifies types of hazards		
e) Military Training Routes and Special-Use Airspace (MOA's RA's, etc.) clearly marked		
f) Are transmission wires and other hazards clearly marked		
g) Has a Safety Briefing been held with Primary and Relief Pilot(s) concerning known local hazards		
h) Has a this briefing been documented on the Daily Diary		
i) Is a smaller scale Hazard Map being carried aboard the aircraft		
9) Power Checks completed and documented in accordance with the procurement document (check documentation)		
10) Agency requirement for Safety Officer Inspection current and documented		

IHOG APPENDIX E - HELITACK CREW AND HELIBASE PREPAREDNESS REVIEW

E. SAFETY AND TRAINING (continued)

CODE KEY: E = EXCEEDS STANDARD M = MEETS STANDARD NI = NEEDS IMPROVEMENT NR = NOT REVIEWED

DESCRIPTION	CODE	REMARKS
11) Condition of Personal Protective Equipment (PPE)		
a) Flight Helmets		
b) Hardhats		
c) Eye Protection		
d) Hearing Protection		
e) Flight Suits		
f) Fire pants and shirts		
g) Flight Gloves		
h) Work Gloves		
i) Boots		
j) Line Packs		
k) Saw Chaps		

Additional Information

IHOG APPENDIX E - HELITACK CREW AND HELIBASE PREPAREDNESS REVIEW

F. PREFLIGHT PLANNING

CODE KEY: E = EXCEEDS STANDARD M = MEETS STANDARD NI = NEEDS IMPROVEMENT NR = NOT REVIEWED

DESCRIPTION	CODE	REMARKS
1) Are air crews and helicopter personnel familiar with the helicopter flight planning sections of the interagency helicopter operations guide and agency handbook flight planning requirements		
2) Is a helicopter preflight being completed daily and documented		
3) Does the pilot obtain flight weather data for mission planning purposes		
4) Is the dispatch office furnishing the helicopter crew with adequate information to accomplish missions safely and effectively (e.g., form HCM-11, Aircraft Dispatch Form)		
5) Is a preflight briefing being held prior to every non-fire flight that addresses mission objectives, hazards, etc		
6) Are load calculations and manifests being completed properly? (check past flights)		
7) Does the base have an established plan for flight dispatch, flight plans, and flight following? (query base personnel and pilots)		
8) Are air crews and helicopter personnel aware of dispatch requirements as contained in the aircraft contract		
9) Do flight following procedures meet safety requirements		
10) Does the crew have forms HCM-6, Helicopter Information Sheet and HCM-7, Helicopter Crew Information Sheet prepared		
11) Is there a local area jurisdiction map posted and current		

Additional Information

IHOG APPENDIX E - HELITACK CREW AND HELIBASE PREPAREDNESS REVIEW

G. CRASH RESCUE

CODE KEY: E = EXCEEDS STANDARD M = MEETS STANDARD NI = NEEDS IMPROVEMENT NR = NOT REVIEWED		
DESCRIPTION	**CODE**	**REMARKS**
1) Have appropriate helibase personnel received training in crash-rescue procedures and use of extinguishers		
2) Have personnel assignments been made in the event of a crash at the helibase		
3) Has a crash/rescue drill been conducted this year		
4) Is the Aircraft Emergency Response Plan clearly posted and/or accessible at the helibase		
5) Is the Local/Unit Search and Rescue Plan clearly posted and/or accessible at the helibase		
6) Have all personnel been briefed on their responsibilities relative to both the aircraft emergency response and the district search and rescue plans		
Additional Information		

IHOG APPENDIX E - HELITACK CREW AND HELIBASE PREPAREDNESS REVIEW

H. CACHE AND EQUIPMENT

CODE KEY: E = EXCEEDS STANDARD M = MEETS STANDARD NI = NEEDS IMPROVEMENT NR = NOT REVIEWED

DESCRIPTION	CODE	REMARKS
1) Is helicopter accessory/equipment storage space adequate		
a) Overall storage facility condition, inside and out		
b) Inventory and use records are available and current		
c) Inventories are posted, dated, signed		
d) Cache is secure		
e) Property is identified by Agency		
f) Items are labeled with NFES reference		
g) NFES kits are complete and meet national standard		
2) Is there adequate equipment for initial and extended attack		
3) Storage of flammable/hazardous materials meets Agency standards		
4) Condition of stored equipment and accessories		
a) Crash/Rescue Kit		
b) Evacuation Kit		
c) PPE		
d) Leadlines and swivels		
e) Weighing scales		
f) Nets		
g) Power equipment		
h) Chainsaws		
i) Hand tools meet maintenance standards (Fire Equipment and Storage and Refurbishing Standards NFES 2249)		
j) Flammable/hazardous materials		
5) Aerial ignition equipment		
a) Condition of aerial ignition equipment		
b) Equipment maintained in accordance with Aerial Ignition Guide		
c) PSD Log is completed as appropriate		
d) Annual certification is complete for equipment and personnel		
e) MSDS information is carried with aerial ignition equipment		
6) Fire extinguisher service is current and location is identified per Agency standard		

Additional Information

IHOG APPENDIX E - HELITACK CREW AND HELIBASE PREPAREDNESS REVIEW

I. HELICOPTER

MAKE/MODEL	FAA REGISTRATION #	CURRENT HOBBS READING

CODE KEY: E = EXCEEDS STANDARD M = MEETS STANDARD NI = NEEDS IMPROVEMENT NR = NOT REVIEWED

DESCRIPTION	CODE	REMARKS
1) Aircraft Data Card		
a) Signed by and date		
2) Is the Transportation of Hazardous Materials Handbook aboard		
a) Is the current DOT exemption aboard		
b) Is the current Emergency Response Guide (ERG) aboard		
c) Is pilot familiar with handbook		
3) Is Flight Manual up-to-date and are appropriate charts being used		
4) Check condition of the following		
a) Emergency Locator Transmitter		
b) Battery date on ELT		
c) Fire extinguisher(s)		
d) Date last inspected		
e) Condition of first aid kit (check components against contract requirements)		
f) Condition of survival kit (check components against contract requirements)		
g) Convex mirror		
h) Seat belts and shoulder harnesses		
i) Pilot's helmet (does it meet requirements)		
j) Radios		
k) FM-1, FM-2 (if required) radio		
l) AM-1, AM-2 (if required) radio		
m) AUX-FM (if required)		
n) Frequency and tone list readily available to the pilot		
o) GPS navigational equipment		
p) Instructional booklets available		
q) Pilot knowledgeable of use		
r) General helicopter condition		
s) Skin and exterior		
t) Windows		
u) Doors		
v) Upholstery		
w) Cargo compartment		
x) Skids/wheels		
y) Fixed tank (If applicable)		
z) Bucket(s)		
aa) Dual Lock-Out Security Measures		
bb) Automated Flight Following (if applicable)		

IHOG APPENDIX E - HELITACK CREW AND HELIBASE PREPAREDNESS REVIEW

I. HELICOPTER (continued)

CODE KEY: E = EXCEEDS STANDARD M = MEETS STANDARD NI = NEEDS IMPROVEMENT NR = NOT REVIEWED		
DESCRIPTION	**CODE**	**REMARKS**
5) Any major component changes since arrival on base, or imminent		
6) Required maintenance is performed, approved, and documented		

Additional Information

IHOG APPENDIX E - HELITACK CREW AND HELIBASE PREPAREDNESS REVIEW

J. FUEL SERVICING VEHICLE

VEHICLE MAKE/MODEL	LICENSE #	GVWR RATING	
INSPECTED/CARDED BY	**TANK CAPACITY**	**RAPID REFUELING PROVISIONS**	
		OPEN-PORT	
		CLOSED CIRCUIT	

CODE KEY: E = EXCEEDS STANDARD M = MEETS STANDARD NI = NEEDS IMPROVEMENT NR = NOT REVIEWED

DESCRIPTION	CODE	REMARKS
1) Does driver have mileage log established		
2) Does driver have a fuel quality control log established		
a) Is log up-to-date		
b) Is sump drained daily (tank and filter)		
c) Fuel sampling bottle condition		
d) Sampling frequency		
3) Does filter system meet specifications and is it properly signed off by maintenance inspector		
4) Does bonding system meet standards, is process understood		
5) Fire extinguishers:		
a) Number		
b) Type		
c) Capacity		
d) Condition		
e) Date(s) of last inspection		
f) Are the extinguishers the proper type and have they been inspected		
6) General mechanical condition of truck		
7) Are necessary hazmat permits required by contract available in the vehicle		
8) Has local map set been furnished (agency transportation system/land status)?		
9) Does driver have all necessary PPE per the Procurement Document		
a) Is he/she aware of requirements for use		
10) Is driver aware of DOT duty day/driving time limitations? (test knowledge)		

Additional Information

IHOG APPENDIX E - HELITACK CREW AND HELIBASE PREPAREDNESS REVIEW

K. HELICOPTER CREW CHASE TRUCK

VEHICLE MAKE/MODEL	LICENSE #	GVWR RATING

CODE KEY: E = EXCEEDS STANDARD M = MEETS STANDARD NI = NEEDS IMPROVEMENT NR = NOT REVIEWED

DESCRIPTION	CODE	REMARKS
1) Does truck meet agency standard (GVW; passenger capacity)		
a) Loaded vehicle weight is documented in log book and meets vehicle specifications		
2) Is a truck inventory list posted (specific to compartment/location)		
a) Inventory meets standards found in IHOG Chapter 9		
b) Are all boxes and bags clearly labeled		
3) References/paperwork available include:		
a) Accident Report Forms		
b) Communications Plan		
c) Posted Frequencies		
d) Preventative maintenance checks are documented and current		
e) Use Record current		
f) Vehicle Accident/Personnel Injury Forms		
g) Unit Maps		
h) Current DOT Emergency Response Guide		
i) Current Credit Card		
4) Check condition of accessories and equipment		
a) Initial attack gear		
b) Overnight gear bags (within 35 Lb. limit?)		
c) Leadlines and swivels		
d) Weighing scales		
e) Nets		
f) Pump(s)		
g) Fire hand tools		
h) Chainsaws		
i) Non-skid surface per OSHA 29CFR1910		
j) Fire Extinguisher with current inspection and identified per Agency standard		
k) Hazard Reflectors/Flares		
l) First Aid/Trauma Kit is available, appropriate size and identified per Agency standard		
m) Jack, serviceable and appropriate to GVW		
n) Lug Wrench		
5) Does truck have adequate communications (FM/AM)		

Additional Information

IHOG APPENDIX E - HELITACK CREW AND HELIBASE PREPAREDNESS REVIEW

L. HELITACK CREW

CODE KEY: E = EXCEEDS STANDARD M = MEETS STANDARD NI = NEEDS IMPROVEMENT NR = NOT REVIEWED

DESCRIPTION	CODE	REMARKS
1) Module meets agency training and experience requirements for:		
a) Agency Minimum crew size		
b) Helitack Crew Supervisor		
c) Assistant Crew Supervisor		
d) Lead Crew Member		
e) Crew Members		
2) Supervisors are familiar with administrative issues and prepare proper documents as required:		
a) Time and Attendance		
b) Crew Time Reports		
c) Fire Time Reports		
d) Travel/Per Diem Vouchers		
e) Accident/Injury Reports		
f) Credit Card purchases and records		
g) Fleet Purchasing Cards		
h) Aircraft Payment Forms		
i) Contract Daily Diaries		
3) Helitack Crew have reviewed and signed an Employee Performance Plan for the current season		
QUALIFICATIONS AND TRAINING		
4) The Incident Qualifications and Certification System is used to produce Red Card qualifications		
a) Helitack Crew have current Red Cards		
5) Helitack Crew have a documentation file for:		
a) Individual Development Plan (IDP)		
b) Current season training		
c) Past season training		
d) Certifications of training (electronic or hardcopy)		
e) Fire experience		
f) Task Books initiated appropriate to training needs		
g) Performance Evaluations		
6) Helitack Crew has access to training materials and equipment		
7) Helitack Crew is current with the following training per agency policy:		
a) Annual fire fighter safety refresher training		
b) Defensive driving for drivers		
c) First Aid		
d) CPR		
e) Blood-Bourne pathogens		
f) Agency medical standards		
g) Hazardous materials awareness		

IHOG APPENDIX E - HELITACK CREW AND HELIBASE PREPAREDNESS REVIEW

L. HELITACK (continued)

CODE KEY: E = EXCEEDS STANDARD M = MEETS STANDARD NI = NEEDS IMPROVEMENT NR = NOT REVIEWED

DESCRIPTION	CODE	REMARKS
7) Helitack Crew is current with the following training per agency policy: (continued)		
h) S-212 for chainsaw operators		
i) Power tool training		
j) Mutual Respect/Sexual Harassment/Civil Rights/EEO		
k) Fire Extinguisher use		
l) A-110 Transportation of Hazardous Materials		
m) Local resource management issues		
n) Roles and responsibilities/Chain of Command/unit organization		
o) The Risk Management process		
p) S-271/RT-271, S-372/RT-372		
q) Local security requirements and procedures		
r) Hover Hook-up and Long Line Operations		
s) Aerial Ignition		
t) Rappel operations (as needed)		
u) Short-haul operations (as needed)		
v) Crash-Rescue procedures		
w) Accident/Injury reporting (CA1/CA2/CA16/vehicle accidents)		
x) SAFENET reporting		
y) SAFECOM reporting		
8) Helitack Crew is aware of and meets agency standards for:		
a) Duty Limitations (vendor personnel)		
b) Work/Rest requirements		
c) Mobilization and get-away time frames		
d) Transportation of Air Crews/Contractors		
9) Helitack Crew posses Commercial Drivers License where appropriate		
10) Helitack Crew participate in an established physical fitness program		
11) Helitack Crew is aware of and meets agency standards for:		
a) Job Hazard Analysis for project and fire tasks as required		
b) Unit safety plan is available and can be readily accessed		
c) Participation in and documentation of Tailgate Safety Session		

Additional Information

IHOG APPENDIX E - HELITACK CREW AND HELIBASE PREPAREDNESS REVIEW

M. PROFICIENCY CHECKS - OPTIONAL

CODE KEY: E = EXCEEDS STANDARD M = MEETS STANDARD NI = NEEDS IMPROVEMENT NR = NOT REVIEWED

DESCRIPTION	CODE	REMARKS
1) Cargo - net building		
a) Proper packaging		
b) Weights marked		
c) Proper equipment		
d) Load calculations correct		
e) Proper PPE		
2) Hover Hook-Up Operations		
a) Pilot/Crew Briefing		
b) Load Calculations correct		
c) Proper equipment/PPE		
d) Position of Parking Tender/correct hand signals		
e) Hookup procedures		
3) Bucket operations		
a) Position of Parking Tender/correct hand signals		
b) Load Calculations correct		
c) Correct radio directions		
Accuracy of pilot		
d) Out of Fold-A-Tank		
e) Into of Fold-A-Tank		
f) Trail drop on simulated fire		
g) Drop on simulated snag		
h) Hover fill from engine		
4) Fixed-tank operations (if applicable)		
a) Load Calculations correct		
b) Correct fill procedures by crew		
Accuracy of pilot		
c) Trail drop on simulated fire		
d) Drop on simulated snag		
5) Longline operations		
a) Pilot/crew briefing		
b) Load Calculations correct		
c) Proper equipment/PPE		
d) Position of Parking Tender/correct hand signals		
e) Correct fill procedures by crew		
f) Grounding procedures		
g) Proper sling load procedures		

IHOG APPENDIX E - HELITACK CREW AND HELIBASE PREPAREDNESS REVIEW

M. PROFICIENCY CHECKS - OPTIONAL (continued)

CODE KEY: E = EXCEEDS STANDARD M = MEETS STANDARD NI = NEEDS IMPROVEMENT NR = NOT REVIEWED

DESCRIPTION	CODE	REMARKS
6) Personnel/internal cargo transport operations		
a) Load Calculations correct		
b) Manifesting correct		
c) Personnel safety briefing		
d) Position of Parking Tender/correct hand signals		
e) Personnel safety during entry		
f) Cargo accurately weighed and marked		
g) Internal cargo stowed correctly		
h) External cargo stowed correctly		
i) External cargo removed correctly		
j) Personnel safety during exit		
7) Hazardous Material handling (reference Agency Handbook)		
a) Understanding by crew of material		
b) Proper fuel containers		
c) PProper packaging and marking		
d) Transport procedures		
e) Training completed (date)		
f) Proper manifesting		
g) Proper notification of pilot		
8) Helitorch procedures (reference Interagency Aerial Ignition Guide)		
9) PSD procedures (reference Interagency Aerial Ignition Guide)		
10) Rappelling procedures (reference Interagency Helicopter Rappel Guide)		
a) Equipment to standard		
b) Rappelling procedure		
c) Emergency procedure		
d) Equipment records		
e) Spotter records		
f) Has crew/pilot met currency requirements		
11) Short-haul procedures (reference Interagency Helicopter Short-haul Guide)		
a) Equipment to standard		
b) Short-haul procedure		
c) Emergency procedure		
d) Equipment records		
e) Spotter records		
f) Has crew/pilot met currency requirements		

Additional Information

IHOG APPENDIX E - HELITACK CREW AND HELIBASE PREPAREDNESS REVIEW

N. SUMMARY

Review with Heltiack Supervisor, Crew and Vendor as appropriate; Closeout with local Fire Management; Submit formal evaluation as soon as possible.

GENERAL READINESS OF THE BASE	
ITEMS WHICH ARE DEFICIENT	
CORRECTIVE ACTION TO BE TAKEN	

IHOG APPENDIX E - HELITACK CREW AND HELIBASE PREPAREDNESS REVIEW

N. SUMMARY (continued)

ITEMS WHICH ARE DEFICIENT (continued)	
CORRECTIVE ACTION TO BE TAKEN (continued)	

IHOG APPENDIX E - HELITACK CREW AND HELIBASE PREPAREDNESS REVIEW

O. RECOMMENDATIONS AND FOLLOW-UP REQUIREMENTS

Review with Heltiack Supervisor, Crew and Vendor as appropriate; Closeout with local Fire Management; Submit formal evaluation as soon as possible.

WE CONCUR WITH THE BELOW OBSERVATIONS, EVALUATION, AND RECOMMENDATIONS

EVALUATOR NAME	SIGNATURE	AGENCY	DATE

DUE DATE	REFERENCE SECTION	REQUIREMENT OR RECOMMENDATION	COMPLETE DATE

IHOG APPENDIX E - HELITACK CREW AND HELIBASE PREPAREDNESS REVIEW

O. RECOMMENDATIONS AND FOLLOW-UP REQUIREMENTS (continued)

DUE DATE	REFERENCE SECTION	REQUIREMENT OR RECOMMENDATION	COMPLETE DATE

APPENDIX F: DAILY HELICOPTER OPERATIONS BRIEFING/DEBRIEFING CHECKLIST. (HJA-1)

I. Purpose.

The purpose of the Daily Helicopter Operations Briefing/Debriefing Checklist is to provide the Helibase Manager with the means to brief all helibase personnel, including Pilots. The form also provides for feedback from all helibase operational areas and Pilots at the nightly debriefing.

II. Applicability.

The checklist is required and must be implemented by the second operational period on incident helibases, or on helispots to which two or more helicopters are assigned. On project helibases with two or more helicopters assigned, the form must be implemented prior to the start of the first day's operations.

III. Responsibility and Instructions for Completion.

The Helibase Manager is responsible for ensuring the form is initially completed and for completing the checklist on a daily basis thereafter. All personnel assigned to the helibase, including Pilots, must review the checklist. It must also be used for post-operational debriefings. Pilots must sign or initial the checklist daily to indicate that they have received a briefing.

The Briefing Section should be covered with all helibase personnel and Pilots present. All Pilots must initial the checklist to indicate that they have been briefed.

The Debriefing Section should be covered with all helibase personnel and Pilots present.

Anyone not present for either briefing must be briefed individually.

The checklist may be used for a seven-day period, after which a new one must be initiated. Enter the appropriate date(s) below each day on the new checklist.

The blank blocks below each day are for the Helibase Manager to initial, to indicate the item has been completed and/or discussed.

The checklist items themselves are self-explanatory. Further guidance on each item is found in the appropriate chapter of the Interagency Helicopter Operations Guide.

Refer to Appendix H, Helibase Manager's Reminders List, which addresses one-time 'start- up' items (for example, helibase location considerations).

Any deviation from established procedures must be approved by the appropriate higher level of authority.

IV. Posting.

The current form shall be posted on the helibase display board.

V. Routing and Filing.

After a checklist has been completely used (that is, after seven days), it should be placed in the helibase file for later inclusion in the incident or project file.

VI. Related Forms.

Helibase Management (HBM) forms and Helicopter Management (HCM) forms are not specifically discussed within the checklist. However, many items may be initialed as complete through completion of these forms.

Appendix H, Helibase Manager's Reminders List, may be used by the Helibase Manager as a job aid to ensure that daily checklist items have been addressed. The Helibase Manager may incorporate parts of the Reminders List in the briefing or debriefing as appropriate.

The Interagency Aerial Ignition Guide contains Helitorch and Plastic Sphere Dispenser Operations Checklists. They should be used as a supplement, not in lieu of, the Daily Helicopter Operations Briefing/Debriefing Checklist.

DAILY HELICOPTER OPERATIONS BRIEFING/DEBRIEFING CHECKLIST

Initial Date:	**Helibase Name:**		**Incident Name:**
Unit (Forest/District/Park/Reservation/etc):		**Latitude:**	**Longitude:**
Helibase Manager Name:	**ASGS Name:**		**AOBD Name:**
OPS Section Chief or Project Aviation Manager Name:			
This checklist initiated on _____ / _____ / _____ **and will be used through** _____ / _____ / _____ **(Start date + 6 days)**			
Remarks:			

Instructions: Enter the Date below each day (for example, 6/30 below Day 1). All items must be checked or initialed daily. Once a 7 day cycle has been completed, a new Checklist must be initiated. Review all one time start up items contained in the IHOG, Appendix H, Section I. The Helispot Site Selection and Layout in Section II of the Reminder List should also be reviewed. Sections I-VI of this checklist are used to brief personnel at the start of the operational areas. Use Section VII, Debriefing, of the Checklist to debrief personnel at the end of the operational period. At the debriefing, the helibase Manager should address any deficiencies in the day's operations, and identify corrective action to be taken prior to the next day. Pilots in particular should be asked for their evaluation of the day's operations.

HJA-1 (01/05) REQUIRED

DAILY HELICOPTER OPERATIONS BRIEFING/DEBRIEFING CHECKLIST

	Checklist Item	Insert Date for Next 7 Days:						
	I. Organization and Personnel	Check Off Box when Briefing Completed:						
		1	2	3	4	5	6	7
A	Helibase Organization Chart completed, reviewed and posted. Trainee assignments made.							
B	Personnel responsibilities (job descriptions, IHOG Chap 2) reviewed. Personnel are aware of their days assignment.							
C	Pilot flight time is being recorded on the helibase board.							
D	Contractor and Government personnel are properly rested. Work /rest and length of assignment guidelines being adhered to.							
E	Appropriate personnel have a copy of the Incident Action Plan or Project Plan; all Pilots, Helispot Managers, and Helicopter Managers have a copy of ICS-220, ICS-205 and Incident Map.							
	II. Communications	Check Off Box when Briefing Completed:						
		1	2	3	4	5	6	7
A	Communications plan available, current, discussed , and posted. Frequencies known to all personnel							
B	Flight Following and TOLC procedures known and discussed; communications within helibase, to Incident Command Post or Project Base, and to Helispots are adequate.							
C	Adequate number of radios and batteries available to cover appropriate helibase positions and helispots. All radios (including Aircraft) are tested prior to operations.							
	III. Landing Areas	Check Off Box when Briefing Completed:						
		1	2	3	4	5	6	7
A	Separation between helibase pads is adequate; separate areas are established for different types of helicopters and operations; adequate distance for rotor and fixed wing at active airports.							
B	Dust abatement is available or other measures are taken as necessary; if chemicals are used, a local Resource Advisor is consulted.							
C	Helibase approach and departure paths and hover lanes, incident or project flight routes are established, reviewed and posted on the Helibase Display Board.							
D	Operating procedures established and reviewed for movement of helibase personnel and vehicles. Security procedures are established as appropriate.							
E	All helispots are inspected, approved, numbered, and hazards have been discussed with Pilots.							
	IV. Safety	Check Off Box when Briefing Completed:						
		1	2	3	4	5	6	7
A	Helibase Emergency and Crash Rescue Plan is updated, discussed, and posted. Medivac helicopter is assigned and Manager is aware of assignment.							
B	Helibase Aircraft Rescue and firefighting is assigned and personnel are aware of assignments. Fire Extinguisher requirements met and personnel are aware of use.							

HJA-1 (01/05) REQUIRED

DAILY HELICOPTER OPERATIONS BRIEFING/DEBRIEFING CHECKLIST

	Checklist Item	Insert Date for Next 7 Days:						
IV.	**Safety** (continued)	Check Off Box when Briefing Completed:						
		1	2	3	4	5	6	7
C	Visibility at 1/2 mile minimum; weather forecasts and contingency plans for adverse weather and inversion (smoke, fog) discussed.							
D	Use of Personal Protective Equipment for Pilots and helibase personnel known and discussed. Helispot personnel have firefighting tools, PPE, and overnight gear available at staffed helispots.							
E	Military training routes and special use airspace considerations have been discussed with Pilots and Managers.							
F	Temporary flight restriction (if applicable) has been checked by ASGS or AOBD and discussed with Pilots and Managers.							
G	Helibase and on-incident hazards (wires, towers, smoke inversions, other aircraft, etc) are posted on maps and have been discussed.							
H	Previous days safety problems discussed and mitigated.							
V.	**Operations**	Check Off Box when Briefing Completed:						
		1	2	3	4	5	6	7
A	IAP and ICS-220 discussed. Priorities established and reviewed; Initial missions entered into Mission Request Log. Unscheduled Mission request procedures known.							
B	Previous days operational problems discussed and mitigated.							
C	Helicopter tactics discussed; Supervision/control, role of Air Attack and/or Helicopter coordinator known. Aviation Locations Information Summary (HBM-2) distributed to all Pilots.							
D	Load calculations for each helicopter posted and disseminated.							
E	Deck coordination Procedures discussed and known: Passenger briefing, manifesting, cargo, hover hookups, movement of personnel and vehicles around helibase.							
F	Transportation of hazardous materials procedures discussed and personnel are aware of packaging requirements.							
G	Commonly requested items (water and rations) are available at the Helibase. Ordering procedures are in place with the Supply Unit.							
H	Initial Attack helicopter and crew is assigned and have been briefed by the local unit as necessary.							
I	Special Operations (helitorch, plastic sphere dispenser, retardant mixing, etc) plans, procedures, and checklists have been reviewed and approved.							
J	Insure form HCM-4 Helicopter Power check Turbine Engine and Form HCM-5 Turbine Engine Power Trend Analysis is being completed every 10 hours.							

HJA-1 (01/05) REQUIRED

DAILY HELICOPTER OPERATIONS BRIEFING/DEBRIEFING CHECKLIST

	Checklist Item	Insert Date for Next 7 Days:						
	VIII. Daily Debriefing	Check Off Box when Briefing Completed:						
		1	2	3	4	5	6	7
A	Feedback from Pilots.							
B	Communications/TOLC/Radio Operator successes/problems.							
C	Mission scheduling successes/problems.							
D	Deck Coordination successes/problems.							
E	Helispot Manager successes/problems.							
F	Passenger/cargo manifesting successes/problems.							
G	New hazards identified.							
H	General Helibase Successes/problems.							
I	Briefing on next days shift plan and missions. Pilot schedule and start time reviewed. Helibase personnel start times reviewed.							
J	Helicopter Daily Use and Cost Summary (HCM-15) submitted.							
K	Equipment rental shift tickets reviewed and approved.							
L	Crew Time Reports reviewed and approved.							
	Additional Items							

HJA-1 (01/05) REQUIRED

DAILY HELICOPTER OPERATIONS BRIEFING/DEBRIEFING CHECKLIST

	Checklist Item	Insert Date for Next 7 Days:						
	VIII. Daily Debriefing	Check Off Box when Briefing Completed: 1	2	3	4	5	6	7
A	Feedback from Pilots.							
B	Communications/TOLC/Radio Operator successes/problems.							
C	Mission scheduling successes/problems.							
D	Deck Coordination successes/problems.							
E	Helispot Manager successes/problems.							
F	Passenger/cargo manifesting successes/problems.							
G	New hazards identified.							
H	General Helibase Successes/problems.							
I	Briefing on next days shift plan and missions. Pilot schedule and start time reviewed. Helibase personnel start times reviewed.							
J	Helicopter Daily Use and Cost Summary (HCM-15) submitted.							
K	Equipment rental shift tickets reviewed and approved.							
L	Crew Time Reports reviewed and approved.							
	Additional Items							

HJA-1 (01/05) REQUIRED

DAILY HELICOPTER OPERATIONS BRIEFING/DEBRIEFING CHECKLIST

IX. Problems/Mitigation Notes

Date/Time	Item	Mitigation Action	Date/Time

HJA-1 (01/05) REQUIRED

DAILY HELICOPTER OPERATIONS BRIEFING/DEBRIEFING CHECKLIST

X. Certification								
	Date:							
	Day:	1	2	3	4	5	6	7
N #	Pilot Name (print)	Pilot Initials						
Helibase Manager(s) Name(s) (print)		Helibase Manager Initials						

Helibase Managers initials certify that all checklist items have been discussed or accomplished. Any deviation has been documented, and the supervisor has approved the deviation. All pilots operating from the helibase have been briefed on the Checklist items , as represented by their initials above.

HJA-1 (01/05) REQUIRED

DAILY HELICOPTER OPERATIONS BRIEFING/DEBRIEFING CHECKLIST

IX. Certification (continued)

N #	Pilot Name (print)								
		Date:							
		Day:	1	2	3	4	5	6	7
			Pilot Initials						
Helibase Manager(s) Name(s) (print)			Helibase Manager Initials						

Helibase Managers initials certify that all checklist items have been discussed or accomplished. Any deviation has been documented, and the supervisor has approved the deviation. All pilots operating from the helibase have been briefed on the Checklist items , as represented by their initials above.

HJA-1 (01/05) REQUIRED

APPENDIX G: “Reserved”

APPENDIX H: HELIBASE MANAGER'S REMINDERS LIST (HJA-2).

I. Purpose.

The purpose of the Helibase Manager's Reminders List is to provide the Helibase Manager with a comprehensive list of items, procedures and systems required for helibase and helispot management and operations. If items on the Reminders List are adequately covered, then the Daily Helicopter Operations Briefing/Debriefing Checklist should show few, if any, discrepancies.

II. Applicability.

Use of the Helibase Manager's Reminders List is optional, but highly recommended on all multiple aircraft helibases prior to or immediately after the start of air operations. Review of the list at appropriate times during the course of an incident or project is also recommended.

III. Responsibility and Instructions for Completion.

The Helibase Manager should review the Helibase Manager's Reminders List upon arrival at multiple-aircraft operations and should review all or parts of the list on a daily basis thereafter.

The list has been reduced in size to allow for insertion into the Fireline Handbook.

One-time "start-up" items, such as helibase location considerations, should be re-evaluated at appropriate times.

The items on the list are self-explanatory. If uncertain, further guidance can be found in the appropriate chapter of this guide.

IV. Posting.

None. However, the Helibase Manager may post a copy on the helibase display board.

V. Routing and Filing.

None.

VI. Related Forms.

All of the Helibase Management (HBM) forms and several of the Helicopter Management (HCM) forms are discussed. Appendix F, Daily Helicopter Operations Briefing/Debriefing Checklist, covers some but not all of the items contained in the Reminders List.

IHOG Appendix H

Initial date and time:	Helibase name:	Incident name:
Helibase geographic location:		
AOBD and phone number:		
ASGS and phone number:		
Finance Section contact and phone number:		
Supply Unit contact and phone number:		
Local Resource Advisor contact and phone number:		
Local Aviation Manager contact and phone number:		
Land owner (if private) contact and phone number:		

HELIBASE MANAGERS REMINDER LIST

I. Helibase Site Selection and Layout

A. Land ownership

_________If private, Procurement Unit has been notified and a Land Use Agreement is in place.

_________If public, site does not conflict with land use policy and has been approved by local resource advisor.

_________Alternatives sites have been examined, selection factors in B & C below have been considered.

B. Relationship to Base Camp

_________Easy access for personnel and cargo movement.

_________Flight routes are away from base camp and effects of noise and dust on base camp have been considered.

_________Radio and phone communications can be established.

_________Road access for support personnel (fuel and chase trucks) is adequate. If site is unavoidably far from base camp, consider establishing a helispot nearby for recon flights.

C. Location Relative to Incident or Project Site

_________Turnaround times are economical; flight exposure of passengers and crews have been reduced to an acceptable level.

_________Fire spread will not affect helibase operations (smoke, potential overrun of helibase etc.).

_________Weather factors (wind, inversion, fog etc.) have been considered and discussed.

D. Site

_________ Site is adequate for current and projected number and types of helicopters. Landing pads and safety circles can be established with adequate separation for types of helicopters being used.

_________Pads accessible by fuel trucks; if not, consider separate fuel site or pads.

_________Safe hover lanes and approach-departure paths can be established, given current and expected numbers of helicopters.

_________Separation of cargo and personnel pads.

_________If applicable, separation (300 feet) can be provided for helitorch operations.

_________Cargo and crew manifesting area size is adequate.

_________Adequate parking for fuel and support vehicles.

_________Communications can be established with aircraft, Incident Command post , and local Dispatch.

_________Helibase security needs are identified.

E. Hazard Map

_________A flight hazard map covering the entire incident area has been acquired from the local unit and has been posted on the display board. Pilots and other personnel have been instructed to provide additional information as observed

F. Helibase Operations and Communications Area

_________Helibase operations and communications area has been established and deck can be monitored from this area.

G. Helibase Facility Needs (See Appendix K)

_________Helibase display board set up.

_________Operations area shelter set up.

_________Sanitary facilities available.

_________Garbage cans and/or dumpsters available.

_________Sleeping area established.

_________Air Operations Branch Kit available.

________Helibase Support Kit available.

H. FAA Portable Tower

_________ Need for takeoff and landing coordination considered and ordered if needed.

I. Environment

_________Appropriate environmental constraints considered for helibase construction, while still maintaining safety.

II. Helispot Site Selection and Layout

A. Land Ownership

_________If site is public, the Procurement Unit has been notified.

_________If the site is public, the site does not conflict with land use policy, and the Resource Advisor has been notified.

B. Location and Site Selection

_________ Location is appropriate relative to incident or project site.

_________Smoke/inversion, potential for fire overrunning helispot, winds, etc., have been considered and input received from pilots.

_________Helispot is adequate for current and projected number and types of helicopters using it.

_________Helispot is adequate for current and projected number of personnel who may be transported to and from the site.

C. Construction and Inspection

_________Helispot has been built to IHOG standards, and appropriate environmental considerations have been considered for helispot construction, <u>while still maintaining safety</u>.

_________Helispot has been inspected and approved by the AOBD or designee.

_________Helispot is numbered and marked, location has been taken from GPS, recorded on HBM-2 Aviation Locations, and relayed to Plans Section.

_________Hazards identified, recorded and discussed with Pilots. Approach and departure paths discussed and established.

_________Helispot furnished with wind indicators.

_________Helispot furnished with adequate number of fire extinguishers.

III. Personnel and Organization

________Helibase positions have been assigned to and are filled with qualified persons.

________Trainee positions have been identified and assigned. See HCM-7 Helicopter Crew Information Sheet.

________Personnel job descriptions have been reviewed and assigned personnel understand the position requirements.

________Form HBM-1, Helibase Organization Chart, has been updated and posted on the display board.

________Additional helibase personnel needs have been identified and submitted to ASGS for ordering.

________Helibase personnel length of assignment and rotation schedule established.

________Camps staffed with appropriate personnel.

IV. Communications

________ICS-205 (Communications Plan) received and posted on the display board, and updated as necessary. Frequency changes known to everyone, and changes have been put in the ICS-220 Air Operations Summary and HBM-1 Helibase Organization Chart.

________Flight following and TOLC procedures known and discussed. Form HBM-5, Helibase Flight Following Log, established.

________Communications within the helibase, to helispots and ICP adequate.

________ Adequate number and types of radios available for personnel and helispots.

________All radios tested prior to commencement of operations. Spare batteries available.

________Frequencies not overloaded. Frequency discipline has been discussed with pilots and helibase personnel.

________If problems persist, discuss with ASGS or Project Aviation Manager

V. General Planning, Information, and Organizational needs

________HCM-6, Helicopter Information Sheet, and HCM-7, Helicopter Crew Information Sheet, are completed and submitted to Helibase Manager on arrival of helicopter crews.

________Form HCM-8, Interagency Helicopter Load Calculations, is being completed and posted on a daily basis.

_________The Aircraft Base Radio Operator and Aircraft Timekeeper are completing HBM-5, Flight Following Log, HBM-6, Mission Request Log, and HBM-7, Helibase Daily Use and Cost Summary.

_________Medevac/Medical Transport Request available as needed.

_________Helitorch Operations and Plastic Sphere Dispenser Operations Checklists are being completed as necessary.

_________A helibase file has been established and all required documentation is being filed appropriately.

_________Weather updates are being requested if there is a change in weather from the Incident Action Plan.

_________A helibase evacuation plan has been established in the event the helibase is overrun by fire. Adequate measures are in place to provide ground fire protection at the helibase.

VI. Operations

_________Parking Tenders are providing proper hand signals and are maintaining control and access to the pads.

_________Proper wind direction is being given.

_________Parking areas, travel routes, and procedures for fuel trucks have been established and posted.

_________Adequate fuel supply is available or ordered.

_________Appropriate fire extinguishers have been supplied for each fueling pad.

_________Foreign object damage (FOD) control measures have been taken.

_________Cargo area is clean and organized. Cargo is secured appropriately.

_________Crew cleaning and eating areas are clean and maintained. All material secured.

_________Deck has perimeter fencing to prevent drive through and walk through traffic, and is signed appropriately.

_________Measures continue to be effective.

_________Helibase entrance is controlled and has appropriate signage.

_________Night security of aircraft and equipment is provided.

VII. Demobilization

________Form HBM-9, Helicopter Demob Information Sheet, and HBM-9a, Helicopter Flight Request, are being completed for helicopters and crew being demobed, and copies are being forwarded to Demobilization Unit and Dispatch.

________Both modules and individuals are or will be sent through the demobilization process.

________Copies of OAS-23, Aircraft Use Reports, or FS-122, Flight Use Reports, for CWN aircraft, are being given to the local unit as requested.

________HBM-12, Helitack Crew Performance Rating, and HBM-13, Helibase Personnel Performance Rating, are being completed as needed.

VIII. Helibase and Helispot Rehabilitation

________Coordinate with Plans Section, Finance Section, and local Resource Advisor concerning any rehabilitation requirements for the helibase and helispots.

APPENDIX I: REMOTE FUEL SITE REMINDERS LIST (HJA-3).

I. Purpose.

The purpose of the Remote Fuel Site Reminders List is to provide the Helibase Manager and/or Fueling Specialist with a comprehensive list of items, procedures and systems pertaining to remote site fueling operations.

II. Applicability.

Use of the Remote Fuel Site Reminders List is <u>optional</u> but highly recommended for Government-operated fueling operations.

III. Responsibility and Instructions for Completion.

The Helibase Manager should review the list upon arrival at remote site fueling operations and on a daily basis thereafter. The list can be inserted into the Fireline Handbook.

IV. Posting.

None. However, the Helibase Manager may post a copy on the helibase display board.

V. Routing and Filing.

None.

VI. Related Forms.

Appendix F, Daily Helicopter Operations Briefing/Debriefing Checklist, requires that fueling operations be conducted safely. Use of this appendix will help meet this objective.

Exhibit I-1: Remote Fuel Site Reminders List (JHJA-3)

I. SITE SELECTION AND LAYOUT

________Site is adequate for size of operation. See Chapter 13.

________Fueling sites are separate from the main area of helicopter operations.

________Minimum of 90' separation exists between aircraft for Type 2 and Type 3 helicopters.

________Fueling equipment (pump, fuel source) is at least 25' outside the rotor disk of the nearest helicopter.

________Fuel source is downwind of aircraft exhaust and is located so the prevailing wind disperses vapors.

________Site is located so that aircraft can approach/land/depart into the wind.

________Parking area for each fuel dispensing point clearly marked.

II. ORGANIZATION AND PERSONNEL

________Trained, qualified personnel are assigned to the operation. Agency Fueling Specialist is managing government-operated fueling sites. Fueling Specialists are approved and meet agency-specific requirements for training.

________All personnel, including Air Crews and other vendor personnel, are aware of duties and responsibilities as well as refueling, fire protection, and crash rescue procedures.

________At least two persons are assigned to site (one may be the Fueling Specialist). One operates fuel nozzle; the other is staffs emergency fuel shutoff valve.

________For large fueling operations, an Aircraft Base Radio Operator and/or Parking Tender may be required.

III. COMMUNICATIONS.

_________Site has positive radio communications with aircraft before and immediately after refueling.

_________Fueling personnel ensure radios are off (intercom may be left open).

_________Helicopter hand signals understood.

IV. EQUIPMENT.

_________Fuel source (drums, tanks, bladder, or mobile tanker) has been set up and checked for leaks, etc.

_________Each nozzle has correct bonding cable attached.

_________Shutoff valves are serviceable and properly in place.

_________Both closed circuit and open port nozzles are available for use (recommended).

_________Dust covers are attached to nozzle and being used.

_________Pump assembly and filter separator are properly grounded and checked for leaks before operation.

_________Each hose has been hydrostatically tested and inspected for blistering, saturation, nicks, and cuts.

_________Fittings are properly sealed and free of cracks.

_________Hose nozzles are being cleaned daily.

_________Entire system (pump, differential pressure indicator, hoses, couplings) has been checked for proper operation.

V. SAFETY.

_________Area has been cleared of loose sticks, stones and other debris.

_________Fuel containment system or berm has been constructed around fuel bladder to contain fuel in case both temporary and semi-permanent systems rupture.

_________Fire extinguishers meeting minimum requirements are located correctly: one for pump/filter separator and one for each nozzle.

_________Sufficient water is available to wash fuel spills from personnel or wet fuel-soaked clothing prior to removal.

_________Fuel Handlers are wearing protective clothing according to requirements. See Chapter 9.

_________Warning signs (NO SMOKING, DANGER, RESTRICTED AREA, and EMERGENCY SHUTOFF) are posted.

_________Fuel sample has been taken from each <u>dispensing nozzle</u> and checked for contamination daily.

_________Fuel sample has been taken from each <u>fuel source</u> and checked for contamination daily.

_________Passengers, Pilot, and Helicopter Manager are disembarking before refueling. (Exception: Pilot at controls when hot refueling.)

_________Correct bonding procedures are followed. See Chapter 13.

VI. OPERATIONS.

_________Dust cap is being replaced on nozzle after each refuel.

_________Nozzles are being placed on a nozzle hanger (or grounding rod) after each refuel.

_________Nozzle ground cable is attached to grounding rod when not in use.

_________Blowing dust is not a problem at the refueling site.

_________Provisions are made for resupply of fuel source.

VII. OPEN PORT (HOT) REFUELING - SPECIFIC PROCEDURES.

________Safe refueling with engines running is the sole responsibility of the vendor. Government personnel shall not participate in any manner, unless the government is operating the fueling site.

________Vendor-supplied written emergency shutdown and evacuation checklist for the Pilot, Service Truck Operator, and other fueling personnel are at the refueling site.

________Pilot and/or co-pilot shall remain at aircraft.

________Loading of cargo, retardant tank, etc., shall not be accomplished while refueling.

________Strobe lights, rotating beacon lights, radios, and other non-essential electrical systems shall be turned off.

________Position lights shall be left on during night operations.

________Doors and windows adjacent to the fuel port shall be closed. Doors and windows on opposite side shall be left open as escape route.

________Helicopter will be stable with collective at flat pitch and appropriate RPM during hot refueling.

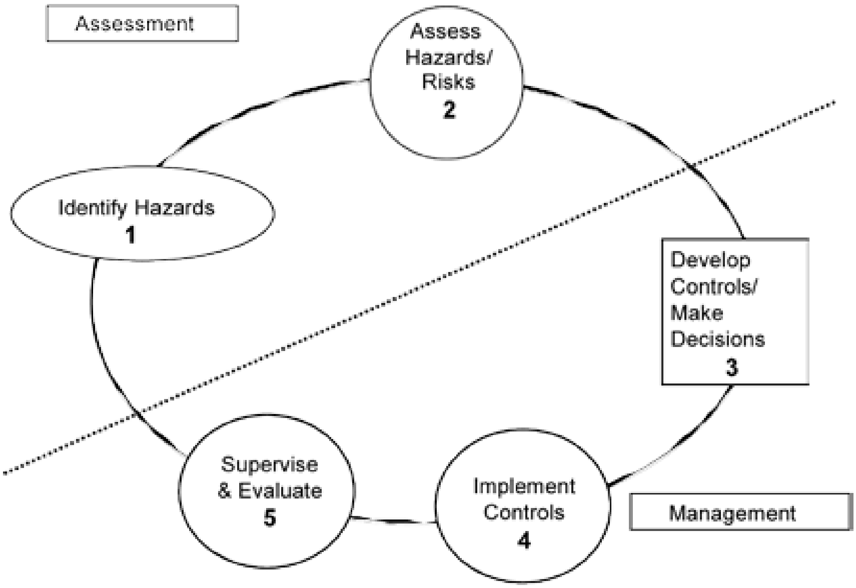
________The fuel servicing vehicle shall be parked outside the safety circle.

________Upon completion of the fueling operation, the fuel nozzle shall be returned to the service truck, and the refueling hose cleared from the landing pad. The hose need not be rolled up each time.

APPENDIX J: Risk Management Tools

I. Risk Management Process

The Risk Management Process



A. Identify Hazards.

The first step in risk management is to identify hazards. The hazards are the potential sources of danger that could be encountered while performing a task or mission. Hazards include weather, time of flight, terrain, equipment, training, and proficiency level of personnel.

Less obvious hazards may become apparent during planning. The Helicopter Manager, the Pilot, others involved or reliant on the flight (Operations Section Chief, Crewboss on the fireline, etc.) and the Helibase Manager, should all identify potential hazards before the operation.

The following is a good example of a mission that contains both hazards to a flight operation and hazards to ground personnel should the flight not be performed.

EXAMPLE: The Helibase Manager receives a mission request to transport food, water, and shelter to crews that have been working the first day of a fire and will remain overnight in a remote camp. Conditions are extremely windy from approaching thunderstorms, visibility is decreasing as sunset nears, and the drop point is less than optimal. The forecast is for severe weather (thunderstorms, hail, possible floods) throughout the night.

In order to provide a systematic approach to identifying threats, a useful memory aid is the **4 Ms**. These are **Method, Medium, Man, and Machine**. There are other mnemonics, of course, but they all have the same goal of helping one recognize the threats that may exist under each category.

Risk or threat detection and identification are part of our daily lives. For example, when sleeping in a hotel, were you ever awakened by the fire alarm? Like many people you probably realized that there were a number of actions that were either immediate or could be delayed, based on the situation. Situation awareness is key to identifying threats and their effect. In our example you probably start by looking for the exit and supporting clues for the validity of the alarm simultaneously. Is there smoke? Do you smell anything unusual? Can you get to and open the door? In an instant you have answered these quick few questions and have triggered the 4 Ms without thinking about them (Medium – environment, condition of the room, presence of fire or smoke; Method – run, walk or crawl to the door, obstacles, shields; Man – what are your physical capabilities, are you panicking; Machine – false alarm or genuine, operation of the door mechanism, locks to clear, fire on the other side of the door).

A very short list of hazards may look like this for our helibase example above using the 4 Ms. The numbers on the left side of the 4M risk chart are the risk levels that are assigned according to Chart J-1: Risk Assessment Matrix on page J-12.

Risk Level	4 Ms
	Method
2	Mission urgency and time available for planning.
3	Limited number of resources and alternatives available.
	Medium
1	Thunderstorms create lightning, winds, turbulence, and restrictions to visibility.
3	Limited visibility, time, and maneuvering in low level environment.
	Man (Generic)
1	Pilot proficiency and training.
2	Communications.
3	Firefighters without water, food, and shelter overnight.
	Machine
1	Helicopter internal load capacity.
2	Helicopter external load capability.

Risk Analysis: The 4 M's

	YES	NO
METHOD		
1. Is there an alternative method which would accomplish the mission more safely and/or efficiently (including accomplishment by ground methods)?	____	____
2. Is the method selected approved and do detailed instructions for safe accomplishment exist?	____	____
3. Have adequate flight following and communications methods been established?	____	____
MEDIUM		
1. Can factors of terrain, altitude, temperature, or weather which could adversely affect the mission's success be mitigated?	____	____
2. Will the mission be conducted at low (below 500' AGL) or high altitudes? Can the same objective be achieved by flying at a higher altitude AGL?	____	____
3. If low-level flight, have all known aerial hazards been identified during the planning process and are they known to all participants?	____	____
4. If there is a potential for an airspace conflict (military, media, or sightseeing aircraft), have mitigating measures been taken?	____	____
5. Have adequate landing areas been identified and/or improved to minimum requirements?	____	____
MAN		
1. Is the Pilot properly carded for the mission to be conducted?	____	____
2. Will the flight be conducted within the Pilot flight time/duty day requirements and limitations?	____	____
3. Have the minimum number of personnel necessary to accomplish the mission safely been assigned, and do they meet personnel qualifications and experience requirements?	____	____
4. Will adequate personnel (flight and ground crew) and Pilot briefings be conducted prior to the flight?	____	____
5. Are users aware that the Pilot-in-command has final authority over any operations conducted involving the aircraft or its occupants?	____	____
MACHINE		
1. Is the aircraft capable of performing the mission in the environment (altitude, temperature, terrain, weather) where the operation will be conducted?	____ ____	____ ____
2. Is the aircraft properly carded for the intended mission?	____	____

B. Assess Hazards/Risks.

Hazard or Risk assessment involves weighing the degree of risk associated with each threat against the objectives of the mission and organization.

An informed decision is best made by weighing the costs and benefits of an operation, while identifying and eliminating unnecessary risk. Two different methods to evaluate risk will be discussed later in this chapter. They differ in the way they look at the threats identified in Step 1.

Specific hazards, such as mission urgency and pilot proficiency, can be addressed by the **Safety Management System** model provided in this Appendix.

The **Green Amber Red** model can address more general risk concerns and is also included here.

The risk assessment for the aviation operation should be conducted by those individuals best qualified by training and experience to evaluate a proposed flight or operation. These personnel include the Helicopter or Resource/Project Flight Manager, the Dispatcher, the Unit Aviation Manager and Line Manager, and ultimately the Pilot, who has the authority to decline a mission which he or she considers excessively hazardous.

C. Develop Controls/Make Decisions.

Identify the control options for all those risks which exceed acceptable levels. Start with the highest risk and work down.

The **STAAR** model of risk management is:

- **S**pread the risk over time, distance or numbers of participants to reduce the effect of a single event.
- **T**ransfer the risk away from critical system components or to those most reliable to decrease probability of a bad outcome.
- **A**void threats by establishing barriers and other controls to eliminate the probability of a bad outcome.
- **A**ccept the level of threat and its probability, with every aspect of the system poised for success.
- **R**educe the effect or exposure through safety devices (PPE, wire cutters, etc.) or limit the number of resources exposed.

1. Some of the control options we have for risk management include:

    - Engineer hazards out of the system. Use/design human operated machines that reduce, avoid, or spread the risk so that it becomes acceptable.

- Guard/Control. These controls affect the environment around the person(s) at risk. They limit exposure, which in effect spreads and reduces risk to an acceptable level.

- Distance. Can spread or reduce risk by inserting a linear or time dimension to the process.

- Time. Time is a critical dimension in risk control and is an outgrowth of the operations tempo. We have plenty of evidence that points to the effect of poor time management and mishaps. A direct relationship can be made between rushing and high risk, particularly in logistics-caused mishaps. Taking enough time to do the job right in the first time is one of the most effective risk controls we have.

- Training and Education. Training and education allows us to accept risk with the understanding that personnel can learn to manage risk.

2. Brainstorm a list of ways to reduce the risk levels that you considered unacceptable in the previous step.
3. Determine the consequences of each alternative on mission and/or team goals.
4. Select the best alternative or combination of alternatives. The mission priority and time criticality will often drive which option is chosen. A conservative response is always preferred to meet this objective.

   The risk management process and documentation discussed in this appendix will provide management an accurate picture of the flight operations system and the aviation risks involved. It allows people to make informed decisions regarding benefit and risk. Management can then set the standards of risk for the mission and determine the appropriate benefit ratio.

D. Implement Controls/Execute and Monitor.

Implement the plan and ensure that the risk controls are in place. Ensure that people know and do what is expected of them. A high level of risk that cannot be effectively controlled should be reported to the operational supervisor. Continually evaluate the effectiveness of the controls and ensure that the risk and benefits remain in balance.

E. Supervise and Evaluate.

Note any changes to the operation, equipment, environment, and/or people and how they may affect your plan. Remember that risk management is a continuous process! Maintain your situational awareness so that you can identify and adjust to unexpected as well as expected threats. Track your progress by taking note of intermediate accomplishments that lead to your objective. Additionally, After Action Reviews are a good way to assure effective supervision and monitoring of the mission. It also allows lessons learned to be captured for the future.

II. Risk Assessment Tools

A. Green Amber Red (GAR) Risk Assessment Model.

Introduction

This model differs from the Safety Management System (SMS) model in several ways. First, it provides a more general analysis of the operational system. Second, it provides a qualitative rating scale for each of the categories that correspond to the identified areas of risk. It is important to remember that risk management is a process that continues throughout the mission. Each assessment model provides a method of evaluating risks as they apply to every mission. The following categories comprise the GAR model:

Supervision

A person designated to provide supervision acts as a control for the risk undertaken. This may be as simple as checking that operations are proceeding according to approved standards. Supervisory control considers the experience, training, proficiency, other qualifications of the supervisor; whether that person's situational awareness, leadership, and communication are effective; and if the required supervision is actually taking place. To effectively provide control the supervisor must:

- Know the goals of the operation (planning),
- Be able to affect the system (leadership, communication, decision making),
- Have a model (plan) of the system and
- Be able to ascertain the state of the system (situational awareness).

The higher the degree of risk, the more the supervisor needs to focus on observing and the larger picture. A supervisor who is easily distracted by hands-on tasks is not an effective safety control in high-risk conditions.

Planning

Consider how informed you and other resources are, how accurate the information is, and the amount of time available to plan for and evaluate the existing and emerging conditions.

Team Selection

Evaluate the character and competence of the individuals to be used. If individuals must be replaced during the operation, assess new team members and how they will interact with those already engaged.

Team Fitness

Assess both the physical and mental state of the team. Consider the amount and quality of duty/rest a crewmember has had and their exposure to sources of stress. The stage of team development should also be scrutinized; it will impact the level of complexity the team is able to manage.

Communication

Evaluate the available communication systems according to: their technical capability, infrastructure, reliability, and the organization's culture. Determine how any barriers to effective communication may be bridged, and identify how errors may be rectified.

Contingency Resources

Contingency planning should be a normal part of all operational planning. These resources are activated only under certain predetermined conditions and/or in emergencies. Consider their activation requirements, response time, and how they would be used.

Environment

Consider factors affecting the performance of people as well as the capabilities and limitations of other resources. These may include the time of day, temperature, humidity, precipitation, wind and other dynamic weather conditions. Terrain affects wind and weather patterns and can both provide benefits and hide other hazards from view.

People are affected by the organizational environment as well. The overt culture of an organization may appear to be one thing when below the surface it is actually something else. Be realistic and truthful regarding the culture of the organization; provide goals and expectations that are understood by all.

Event or Incident Complexity

Careful team selection is of key importance in bringing together individuals with the requisite character and competency. Newly developing teams are equipped with a variety of individual skills. Time is needed for them to develop, and leadership must adapt as the team evolves. Often, they must overcome barriers to successfully integrate. They might be capable of handling simple tasks without much preparation. However, the demands of more complex operations may require that time be set aside for training/team interaction, in order for them to develop the necessary trust and competency to function effectively.

Calculating Risk Using GAR Model

To compute the total risk level, assign a number from 0 (No Risk) to 10 (High Risk) for each of the eight previously identified categories. (An assessment form containing descriptions of risk levels can be developed, similar to Figure J-1.) The individual risk category scores are then totaled. This personal estimate is a starting point for the subsequent discussion, which should include as many of the participants as is practical. This discussion is more important than the actual numbers assigned.

Category	Level of Risk
Supervision	
Planning	
Team Selection	
Team Fitness	
Communication	
Contingency Resources	
Environment	
Complexity	
Total	

Color Coding Risk

The mission risk mirrors the colors of a traffic light. If the total risk value falls in the GREEN ZONE (1-35), risk is rated as low. A moderate level of risk is indicated when the total risk value falls in the AMBER ZONE (36-60), and should the total value fall in the RED ZONE (61-80), you should ensure that all effective control measures have been implemented prior to starting the operation. The Amber and Red risk levels must also be evaluated at a higher level in the organization than the helicopter/helibase manager, so that the organizational risk acceptance levels are aligned with the expected benefit of the operation.

The GAR Model provides a general assessment of operations and allows management to set the standard for risk. Any concern for elevated risk levels in one or more of the categories may require an in depth assessment using a more specific assessment.

Once again, assigning numerical values and colors to hazards using the GAR Model is not the most important part of this risk assessment. The importance lies in the team discussions, which lead to an understanding of the threats, how they will be controlled, and what standards management expects personnel to maintain. This allows decision making, and threat and error management, to be properly aligned with the organization.

The following is an example of the GAR Risk Assessment.

Operation:		Scheduled Date:
Objective(s):		
Supervision	Label the number as appropriate.	
Supervisor has perfect knowledge about the mission, personnel, capabilities and limitations, and is able to apply the appropriate control to minimize risk.	< ☺ 1 2 3 4 5 6 7 8 9 10 ☹ >	Supervisor has little knowledge about the mission, personnel, capabilities and limitations, and lacks skill, knowledge or ability to apply the appropriate control to minimize risk.
Planning		
There is a well designed plan that is reviewed and revised as needed to meet the demands for safety and efficiency and to account for adaptation. Time is well managed.	< ☺ 1 2 3 4 5 6 7 8 9 10 ☹ >	There is no plan or the plan doesn't address many current adaptations made in response of demands for efficiency. Time constraints have a strong effect on ability to plan.
Contingency Resources		
Reliable alternative equipment and personnel are available, easily accessed and informed about the mission requirements.	< ☺ 1 2 3 4 5 6 7 8 9 10 ☹ >	The outcome depends on the equipment and personnel assigned completing the mission perfectly. Failure is not an option.
Communication		
Interpersonal communications are clear and there is a high level of trust in the organization. Adequate personnel and technology are available to relay information accurately to those who make the decisions.	< ☺ 1 2 3 4 5 6 7 8 9 10 ☹ >	There is low trust in the organization or the personnel/communication equipment is unreliable based on the expected needs for the mission.
Team Selection		
Multiple personnel with skill, knowledge and ability are available to fulfill the requirements of the mission. Selection and preparation are done well in advance so there is time to address personal and job related demands.	< ☺ 1 2 3 4 5 6 7 8 9 10 ☹ >	Only one person is available and the success of the mission depends on that person juggling many responsibilities to squeeze this mission into the work schedule. Additional time will be donated to keep up with the workload.

Supervision	Label the number as appropriate.	Description
Team Fitness		
Personnel are trained, proficient, healthy, and rested prior to starting the mission. Personal issues are addressed and little external stress is being exerted.	< ☺ 1 2 3 4 5 6 7 8 9 10 ☹>	Personnel lack one or more critical component in their training. They have many additional duties or social pressures distracting them from their proficiency.
Environment		
Weather and visibility are conducive to the best possible chance for success in the mission. Operational tempo is appropriate for the mission.	< ☺ 1 2 3 4 5 6 7 8 9 10 ☹>	Winds are unpredictable, temperature is extreme, low ceilings and visibilities, precipitation, sun angle creates strong shadows, etc. Mission tempo is too low or high.
Mission Complexity		
A single agency is involved with personnel from the same unit who regularly work together. Mission is straight forward and covered by standard operating procedures.	< ☺ 1 2 3 4 5 6 7 8 9 10 ☹>	Multiple agencies are involved in a novel or confusing mission. Personnel are new to each other and come from different operational cultures. Many leaders are emerging and working toward different objectives.
	Mission Total:	

Benefit Statement	
Operation Approved by: Title: Date:	

Risk Level	Risk Level	Risk Level
GREEN ZONE **(1-35)**	***AMBER ZONE*** **(36-60)**	***RED ZONE*** **(61-80)**

B. Safety Management System.

Several agencies use a Safety Management Systems (SMS) approach as their foundation to aviation safety. The four pillars of SMS are Safety Policy, Safety Risk Management, Safety Assurance and Safety Promotion. SMS is also the standard for safety set by the International Civil Aviation Organization (ICAO) and the Federal Aviation Administration (FAA).

SMS promotes the transition to an aviation safety approach that:

- Emphasizes proactive risk management.
- Promotes a "just" culture.
- Addresses systemic safety concerns.
- Holds the organization accountable.
- Identifies *what* occurred so we can manage the manageable.
- Communicates *why* it occurred so the culture can learn from mistakes.

The intent of SMS is to improve the aviation culture and reduce the number of aircraft accidents by identifying hazards inherent to the mission, recognizing human behaviors that result in error, and devising preventive measures to counter them. Much of this is done at management levels above the field user. However, some hazard and mitigation processes are operational in nature and thus apply to all levels of the organization.

Risk assessment and mitigation is a continual process. Common hazards associated with a helicopter mission – crew fitness, distractions, mission focus, communication, weather, takeoff or landing weights, landing areas, other aircraft, wire and other obstructions – are identified in the system safety analysis. Controls are provided for them. Preflight project planning is extensive for low-level flights and other special use activities, since these environments are especially unforgiving. They require a system of standards and alternatives that crewmembers can use to maintain situational awareness and develop a better foundation for decision making.

According to these standards, crewmembers should plan, and train, for worst-case scenario events. This encourages them to develop contingencies ahead of time, rather than reacting to rare but dangerous events (e.g. tail rotor compromise, ground resonance) as they unfold. This anticipation of worst-case events should continue throughout all phases of the operation.

In order to anticipate specific threats/hazards, this model helps determine (1) the severity of impact on the mission, environment, personnel, and equipment should the hazard be encountered, and (2) the likelihood that the hazard will be encountered.

1. Severity. If the threat/hazard is encountered during an aviation operation, the effect may be:

- Catastrophic: Results in fatalities and/or system loss.
- Critical: Severe injury and/or major system damage.
- Marginal: Minor injury and/or minor system damage.
- Negligible: Less than minor injury and/or less than minor system damage.

Controls include protective devices, engineering controls, personal protective equipment, a reduction in the number of people involved, and limiting exposure time.

2. Likelihood. The probability of encountering the threat/hazard during the flight mission or operation may be:

- Frequent: continuously or often encountered during each mission.
- Probable: encountered several times during the course of many missions.
- Occasional: encountered sporadically during the course of many missions.
- Remote: encountered infrequently, but chances are remote.
- Improbable: encountered only rarely; chances are possible, but unlikely.

Controls include training; awareness; a safe attitude; good information flow; flexibility and proper timing, location, separation, and routing.

It takes judgment and discretion to evaluate which controls will best reduce or mitigate the risks to an appropriate level for the benefit incurred. Use the Risk Assessment Matrix (Chart J-1) and the Risk Assessment Worksheet to document this process.

IMPORTANT NOTE: Be aware that the initial assessment of risk(s) may indicate an unacceptable level when compared to the expected benefit. However, once controls are determined, the risk assessment may indicate a lowered risk that may be acceptable when compared with the benefit of the operation.

Chart J-1: Risk Assessment Matrix				
	Severity			
Likelihood	**IV Negligible**	**III Marginal**	**II Critical**	**I Catastrophic**
Frequent A			**4**	
Probable B		**3**		**High**
Occasional C		**2**	**Serious**	
Remote D	**1**	**Medium**		
Improbable E	**Low**			

3. Risk Levels. Refer again to Chart J-1. This step concludes the initial risk assessment that describes the risk associated with each of the threat/hazards individually. Each one is quantified as: High, Serious, Medium, or Low. Each assessment must be weighed on the variables of the operation, and benefits must always outweigh costs. **The overall risk of the mission will never be less than the highest specific risk factor (example: one high, one serious, and two medium threats couldn't result in anything less than an overall risk level of high).**

- **High**: The combination of severity and likelihood indicate that threat/ hazard has a greater than 50% chance of exceeding control measures and the result will be critical or worse. Benefit to risk must be carefully weighed and planners ensure that; 1) emergency response resources are positioned for immediate use, 2) approval is made by the highest official in the local organization, and 3) crewmembers are well rested, briefed and aware of the known threats and their controls.
- **Serious**: Risk is high enough that there is uncertainty as to whether the mission can be accomplished without an accident and/or loss of life or serious injury. Hazards may or may not be mitigable.
- **Medium**: Degree of risk is such that the mission can almost certainly be accomplished safely. Hazards exist, but can be mitigated.
- **Low:** The risk involves little or no impact on mission accomplishment. Hazards are those normally associated with flight (possibility of bird strike, mechanical malfunction, etc.).

Risk Assessment and Mitigation (Example):

System

		Pre Mitigation				Post Mitigation					
Sub-system	**Hazards**	**Likelihood**	**Severity**	**Outcome**	**Mitigation**	**Likelihood**	**Severity**	**Outcome**	**Mitigation Achieved ?**	**Additional Local Mitigation**	**Post Mitigation Value**
Capabilities	High DA will overgross the aircraft	Occasional	Occasional	High 4	Use appropriate aircraft for mission. Conduct thorough pre□m ission planning, load calculations, etc.	Remote	Catastrophic	Serious 3	Yes	For Helispot H□43 and H□64 will only use Helicopter N45X a AS350B3 A□Star	Seroius 3
	AC not appropriate for mission.	Occasional	Occasional	Serious 3	Ensure appropriate aircraft is ordered & utilized. Conduct thorough pre□ mission planning, load calculations, etc.	Remote	Critical	Medium 2	Yes		Medium 2

Final Assessment Value:	**Prepared By:**		**Date:**
Operation Approved by:		**Title:**	**Date:**

Risk Level	Appropriate Management Level for Risk Decision	
	Fire	Project
High	Incident Commander or Operations Section Chief	Line Manager
Serious	Incident Commander or Operations Section Chief	Line Manager
Medium	Air Operations Branch Director	Project Aviation Manager
Low	Helibase Manager	Helicopter or Flight Manager

Additional Aviation Risk Management information can be found on the BLM and USFS Aviation websites, including Aviation Operational Risk Assessments specific to helicopter programs, with fillable Risk Assessment Worksheets in Word and Excel format.

http://www.blm.gov/nifc/st/en/prog/fire/Aviation/safety.html

http://www.fs.fed.us/fire/av_safety/index.html

Aviation Risk Assessment Worksheet

Assess the risks involved with the proposed operation. Use additional sheets if necessary.			
Assignment:	**Date:**		
	Pre-Mitigation hazard rate out		
Describe the Hazard:	Likelihood A-E	Severity I-IV	Risk Level
Pre Mitigation Overall Rating:			
	Post-Mitigation hazards rate out		
Mitigation Controls:	Likelihood A-E	Severity I-IV	Risk Level
Post Mitigation Overall Rating:			
Success Probability/Benefit Statement:			

Operation Approved by:	Title:	Date:

Aviation Risk Assessment Worksheet

Risk Assessment and Mitigation of:

System□

		Pre Mitigation				Post Mitigation					
Sub□system	Hazards	Likelihood	Severity	Outcome	Mitigation	Likelihood	Severity	Outcome	Mitigation Achieved ?	Additional Local Mitigation	Post Mitigation Value

Final Assessment Value:	**Prepared By:**	**Date:**
Operation Approved by:	**Title:**	**Date:**

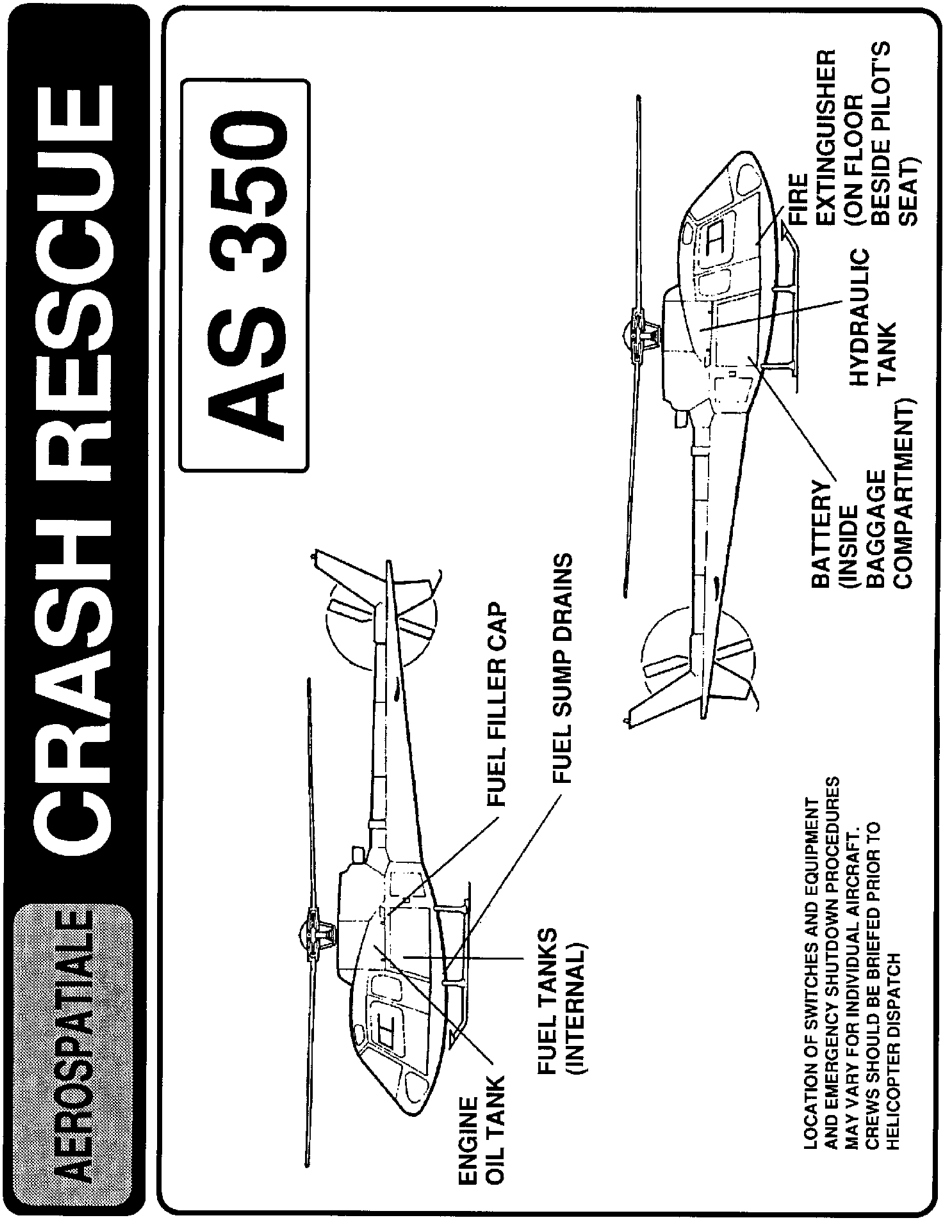
Appendix K Reserved

APPENDIX L: “Reserved”

APPENDIX M: Crash rescue DIAGRAMS

This appendix provides typical diagrams of various makes and models of helicopters. The intent is to provide crash rescue personnel on helibases or other locations with general information concerning aircraft layout, emergency ingress and egress, and emergency procedures for fuel and electrical power shutoff.

It is essential that helibase and other personnel with crash rescue responsibilities, or who may be assigned such responsibilities, receive a briefing by the Pilot on the specific characteristics of the helicopter with which they are working.


AEROSPATIALE
CRASH RESCUE
AS 350
FIRE EXTINGUISHER (ON FLOOR BESIDE PILOT'S SEAT)
HYDRAULIC TANK
BATTERY (INSIDE BAGGAGE COMPARTMENT)
FUEL FILLER CAP
FUEL SUMP DRAINS
FUEL TANKS (INTERNAL)
ENGINE OIL TANK
LOCATION OF SWITCHES AND EQUIPMENT AND EMERGENCY SHUTDOWN PROCEDURES MAY VARY FOR INDIVIDUAL AIRCRAFT. CREWS SHOULD BE BRIEFED PRIOR TO HELICOPTER DISPATCH

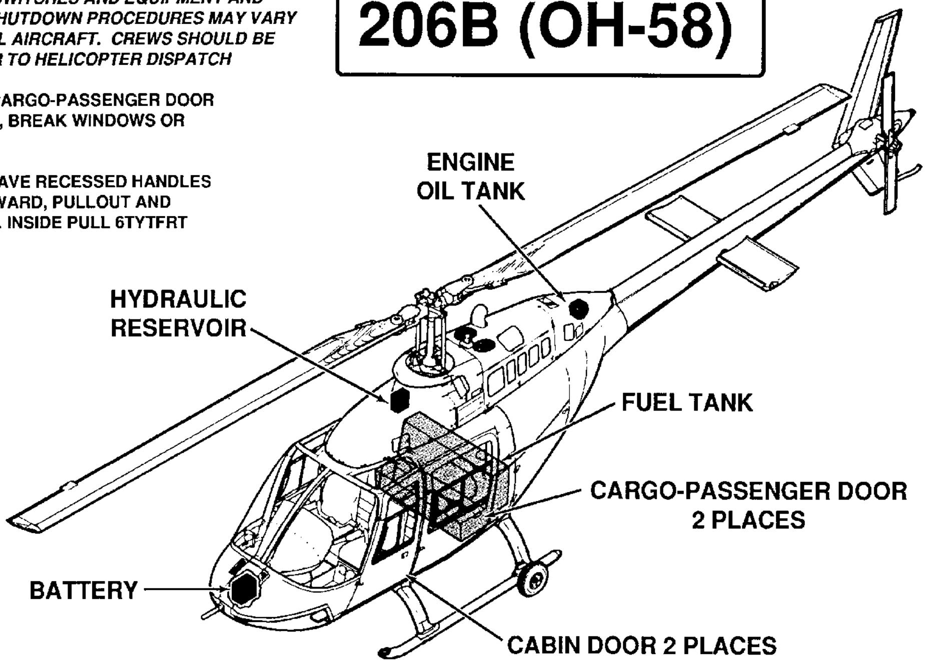
BELL CRASH RESCUE

206B (OH-58)

LOCATION OF SWITCHES AND EQUIPMENT AND EMERGENCY SHUTDOWN PROCEDURES MAY VARY FOR INDIVIDUAL AIRCRAFT. CREWS SHOULD BE BRIEFED PRIOR TO HELICOPTER DISPATCH

*** IF CABIN OR CARGO-PASSENGER DOOR FAILS TO OPEN, BREAK WINDOWS OR WINDSHIELD**

*** ALL DOORS HAVE RECESSED HANDLES POINTING FORWARD, PULLOUT AND BACK OUTSIDE. INSIDE PULL 6TYTFRT HANDLES UP.**



SEE BACK SIDE FOR EMERGENCY SHUTDOWN PROCEDURE

BELL ENGINE SHUTDOWN & AIRCREW EXTRACTION

206B (OH-58)

1. ENGINE SHUTDOWN

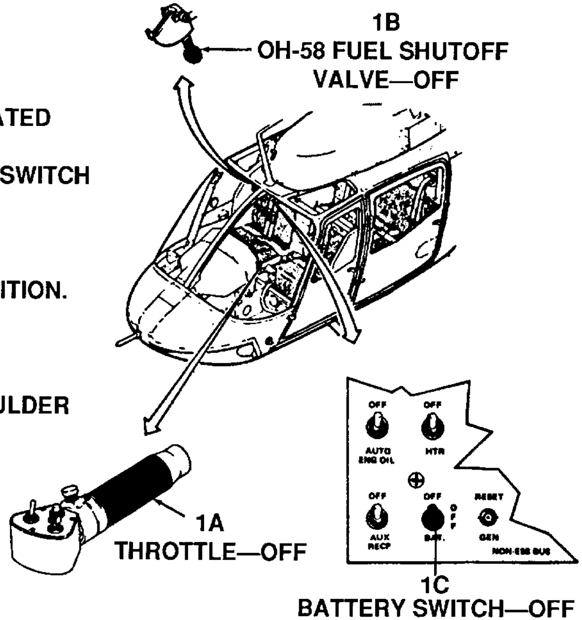
   A. ROTATE THROTTLE , LOCATED ON PILOT'S COLLECTIVE PITCH STICK, TO *OFF* POSITION.

   B. OH-58 PULL FUEL SHUTOFF VALVE, LOCATED OVERHEAD IN CREW COMPARTMENT, AFT TO *OFF* POSITION. 206B TURN FUEL SWITCH ON PANEL TO OFF POSITION.

   C. PLACE BATTERY SWITCH, LOCATED ON OVERHEAD SWITCH PANEL, TO *OFF* POSITION.

2. AIRCREW EXTRACTION

   A. UNLATCH LAP BELTS AND REMOVE SHOULDER HARNESS FROM CREWMEMBER(S).

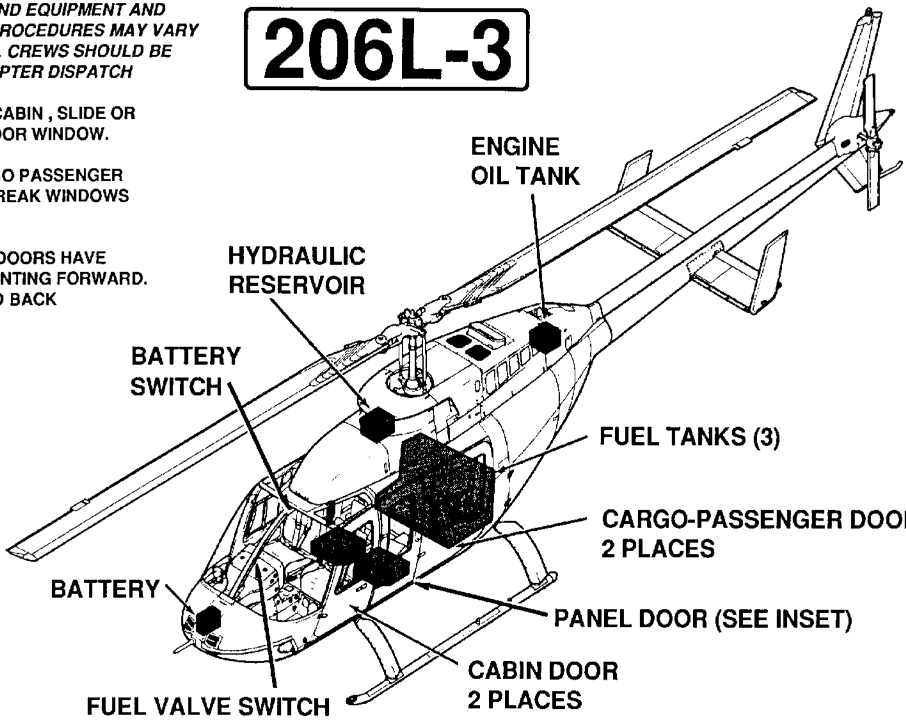


BELL CRASH RESCUE

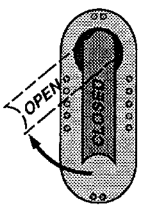
206L-3

LOCATION OF SWITCHES AND EQUIPMENT AND EMERGENCY SHUTDOWN PROCEDURES MAY VARY FOR INDIVIDUAL AIRCRAFT. CREWS SHOULD BE BRIEFED PRIOR TO HELICOPTER DISPATCH

- TO GAIN ENTRANCE TO CABIN , SLIDE OR BREAK EITHER CABIN DOOR WINDOW.
- IF CABIN DOOR OR CARGO PASSENGER DOOR FAILS TO OPEN, BREAK WINDOWS OR WINDSHIELD
- PILOT AND PASSENGER DOORS HAVE RECESSED HANDLES POINTING FORWARD. OUTSIDE—PULL OUT AND BACK INSIDE—PULL UP



PANEL DOOR HANDLE



OPENING INSTRUCTIONS
1. Open rear door
2. Lift panel door handle
3. Rotate as shown

SEE BACK SIDE FOR EMERGENCY SHUTDOWN PROCEDURES

BELL CRASH RESCUE PROCEDURES

206L-3

Emergency Procedure:

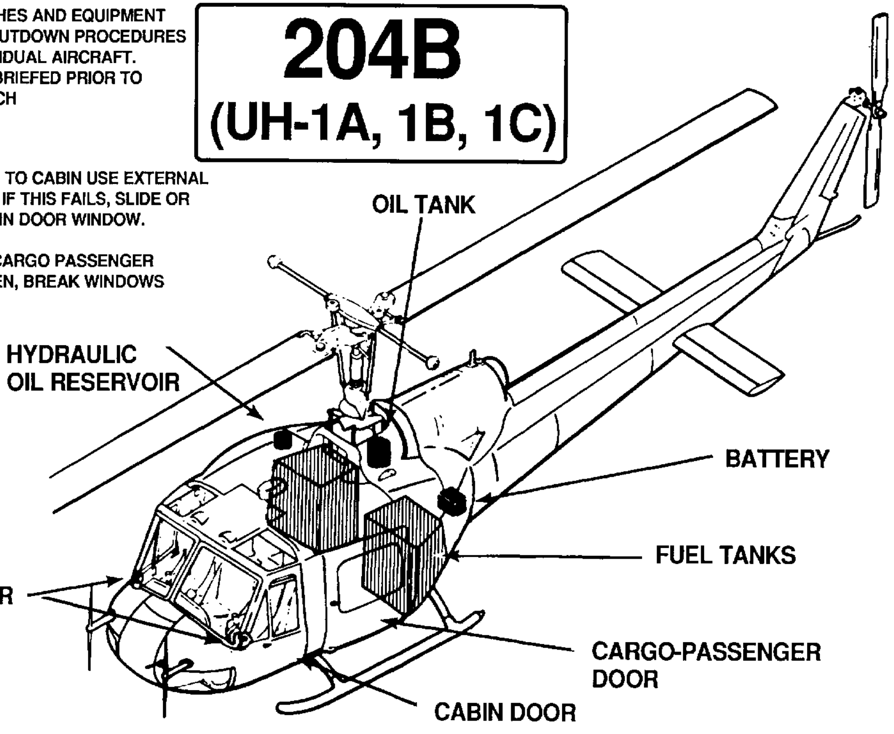
1. *Wait until all rotors have stopped.*
2. *Shut off fuel switch* located in the instrument panel. It's usually covered by a metal red cover.
3. *Disconnect battery* located on nose of helicopter. Remove front panel, and rotate knob counterclockwise, and disconnect cable from battery.
4. *Evacuate personnel* if necessary.
5. *Make sure ELT is in the on position, and remove from helicopter.* ELT is located in the chin bubble area on the pilots side.
6. *Remove fire extinguisher.* It's located between the two front seats at shoulder level.
7. *Remove first aid kit.* It's located between the two aft facing seats in the rear passenger area.
8. If possible, *secure the area from outside interference.*

BELL CRASH RESCUE

LOCATION OF SWITCHES AND EQUIPMENT AND EMERGENCY SHUTDOWN PROCEDURES MAY VARY FOR INDIVIDUAL AIRCRAFT. CREWS SHOULD BE BRIEFED PRIOR TO HELICOPTER DISPATCH

204B (UH-1A, 1B, 1C)

- TO GAIN ENTRANCE TO CABIN USE EXTERNAL JETTISON HANDLE. IF THIS FAILS, SLIDE OR BREAK EITHER CABIN DOOR WINDOW.
- IF CABIN DOOR OR CARGO PASSENGER DOOR FAILS TO OPEN, BREAK WINDOWS OR WINDSHIELD.

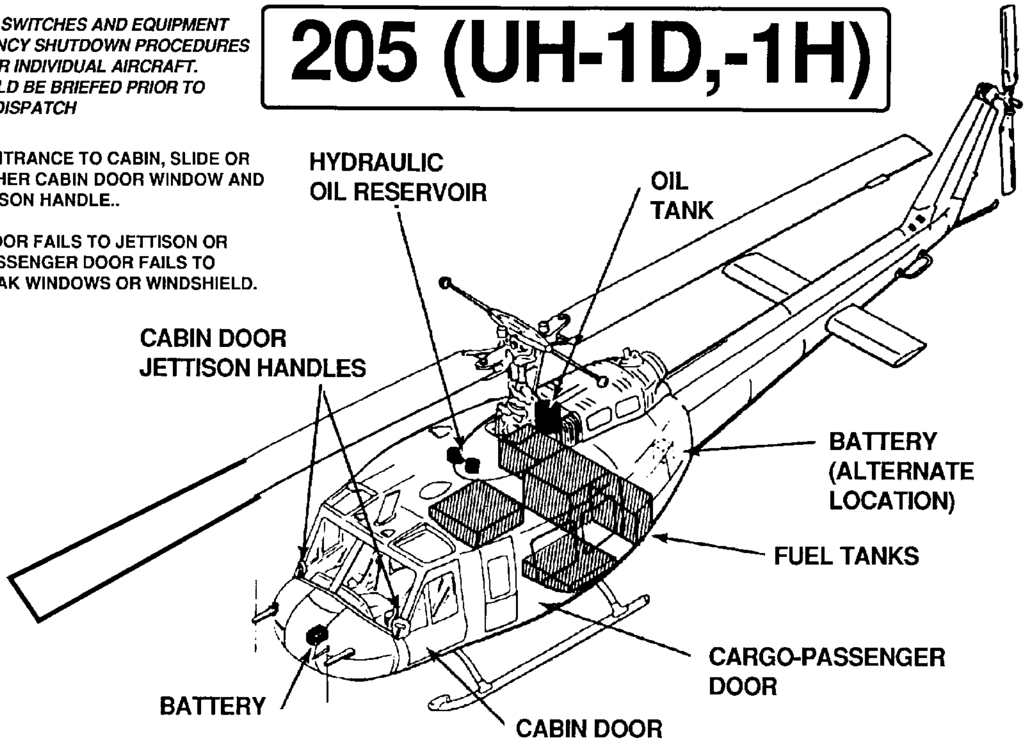


BELL CRASH RESCUE

205 (UH-1D,-1H)

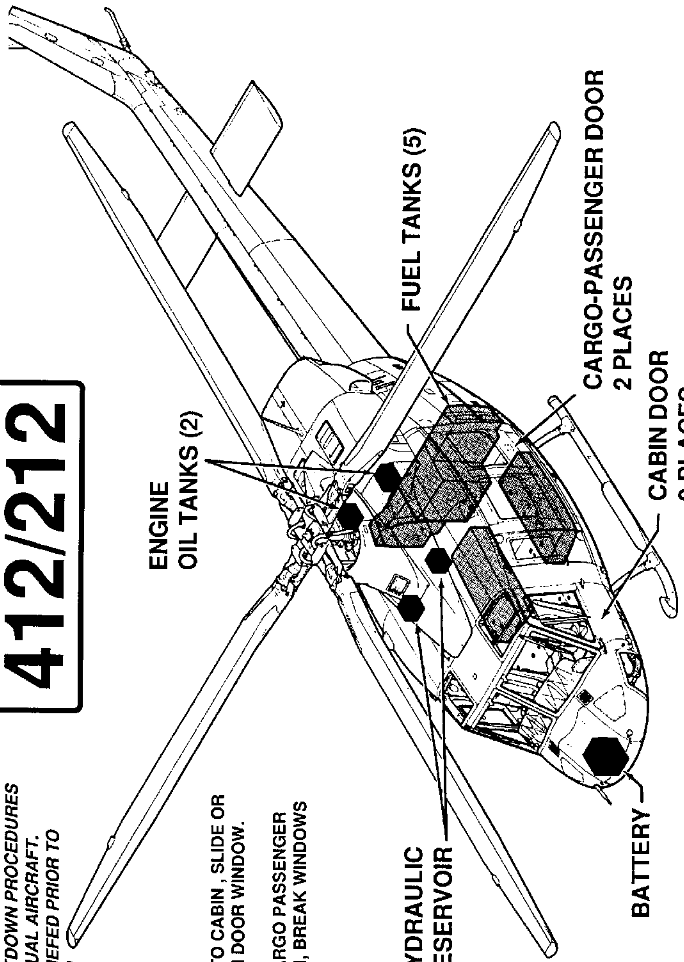
LOCATION OF SWITCHES AND EQUIPMENT AND EMERGENCY SHUTDOWN PROCEDURES MAY VARY FOR INDIVIDUAL AIRCRAFT. CREWS SHOULD BE BRIEFED PRIOR TO HELICOPTER DISPATCH

- **TO GAIN ENTRANCE TO CABIN, SLIDE OR BREAK EITHER CABIN DOOR WINDOW AND PULL JETTISON HANDLE..**
- **IF CABIN DOOR FAILS TO JETTISON OR CARGO-PASSENGER DOOR FAILS TO OPEN, BREAK WINDOWS OR WINDSHIELD.**



BELL CRASH RESCUE

412/212



LOCATION OF SWITCHES AND EQUIPMENT AND EMERGENCY SHUTDOWN PROCEDURES MAY VARY FOR INDIVIDUAL AIRCRAFT. CREWS SHOULD BE BRIEFED PRIOR TO HELICOPTER DISPATCH

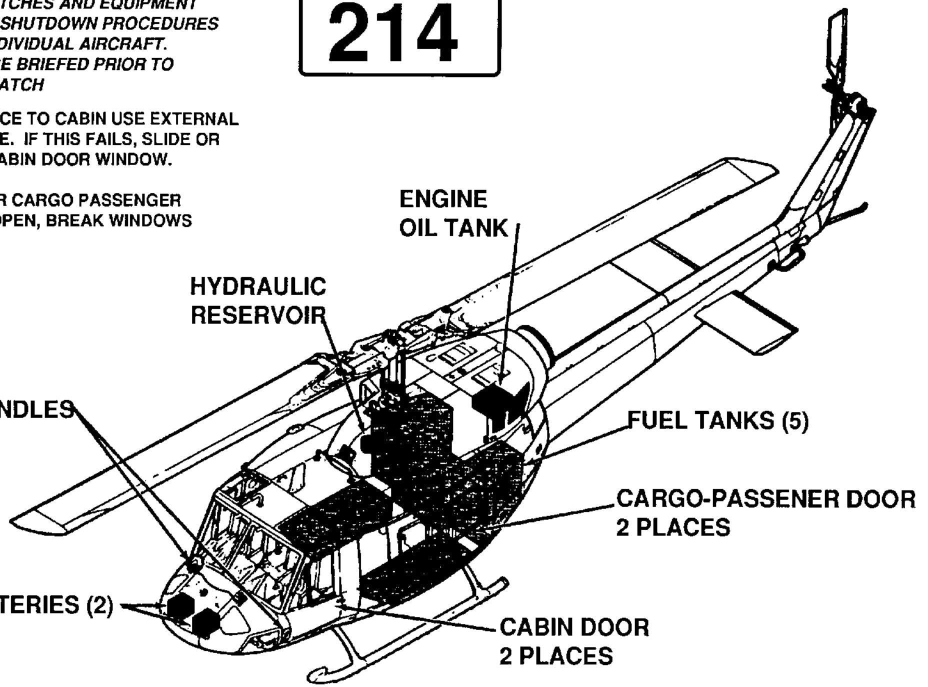
- TO GAIN ENTRANCE TO CABIN , SLIDE OR BREAK EITHER CABIN DOOR WINDOW.
- IF CABIN DOOR OR CARGO PASSENGER DOOR FAILS TO OPEN, BREAK WINDOWS OR WINDSHIELD..

BELL CRASH RESCUE

214

LOCATION OF SWITCHES AND EQUIPMENT AND EMERGENCY SHUTDOWN PROCEDURES MAY VARY FOR INDIVIDUAL AIRCRAFT. CREWS SHOULD BE BRIEFED PRIOR TO HELICOPTER DISPATCH

- TO GAIN ENTRANCE TO CABIN USE EXTERNAL JETTISON HANDLE. IF THIS FAILS, SLIDE OR BREAK EITHER CABIN DOOR WINDOW.
- IF CABIN DOOR OR CARGO PASSENGER DOOR FAILS TO OPEN, BREAK WINDOWS OR WINDSHIELD.

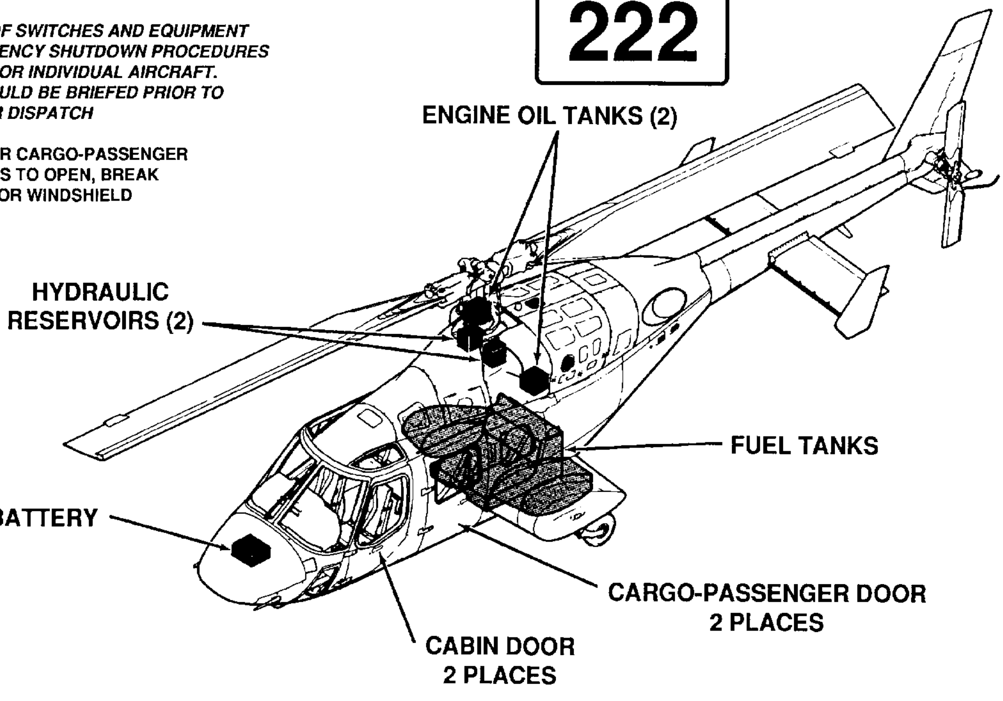


BELL CRASH RESCUE

222

LOCATION OF SWITCHES AND EQUIPMENT AND EMERGENCY SHUTDOWN PROCEDURES MAY VARY FOR INDIVIDUAL AIRCRAFT. CREWS SHOULD BE BRIEFED PRIOR TO HELICOPTER DISPATCH

- IF CABIN OR CARGO-PASSENGER DOOR FAILS TO OPEN, BREAK WINDOWS OR WINDSHIELD



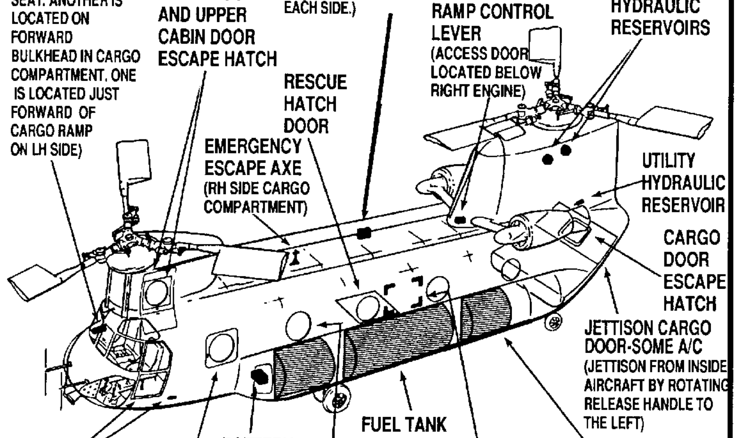
BOEING VERTOL CRASH RESCUE

CH-47

LOCATION OF SWITCHES AND EQUIPMENT AND EMERGENCY SHUTDOWN PROCEDURES MAY VARY FOR INDIVIDUAL AIRCRAFT. CREWS SHOULD BE BRIEFED PRIOR TO HELICOPTER DISPATCH

- EMERGENCY ENTRANCE TO COCKPIT IS GAINED THROUGH JETTISON DOORS BY ACTUATING HANDLE LABELED *DOOR JETTISON PUSH TRIGG*ER, TURN HANDLE. IF DOOR DOES NOT FALL AWAY, PULL AWAY.
- EMERGENCY ENTRANCE TO CARGO COMPARTMENT IS GAINED THROUGH CABIN DOOR OR UPPER DOOR ESCAPE HATCH, CABIN ESCAPE HATCH, RAMP ESCAPE HATCH, AND CUTOUT PANELS. ALL ESCAPE HATCHES CAN BE OPENED BY PULLING THE YELLOW TAB OUT AND PUSHING THE PANEL IN.
- AN ACCESS DOOR TO THE CARGO RAMP CONTROL LEVER IS LOCATED ON RIGHT SIDE OF AIRCRAFT BELOW THE RIGHT ENGINE. RAMP MAY BE LOWERED, PROVIDING EMERGENCY ENTRANCE, BY PLACING THE CONTROL LEVER IN THE DOWN POSITION.
- A RESCUE HATCH LOCATED IN FLOOR OF CARGO COMPARTMENT MAY BE USED FOR EMERGENCY EXIT IF LOWER RESCUE DOOR HAS BEEN PREVIOUSLY OPENED.

TYPE: TWIN-TURBINE ENGINE TANDEM ROTOR
CREW: NORMAL CONDITIONS 3-4
PASSENGERS: 33 FULLY EQUIPPED GROUND TROOPS
LITTERS: 24 W/3 MEDICAL ATTENDANT'S SEATS



SEE BACK SIDE FOR EMERGENCY SHUTDOWN PROCEDURES

BOEING VERTOL — ENGINE SHUTDOWN & AIRCREW EXTRACTION

CH-47

1. NORMAL SHUTDOWN

   A. POSITION ENGINE CONDITION LEVERS, LOCATED ON CONTROL PEDESTAL, TO *STOP.*

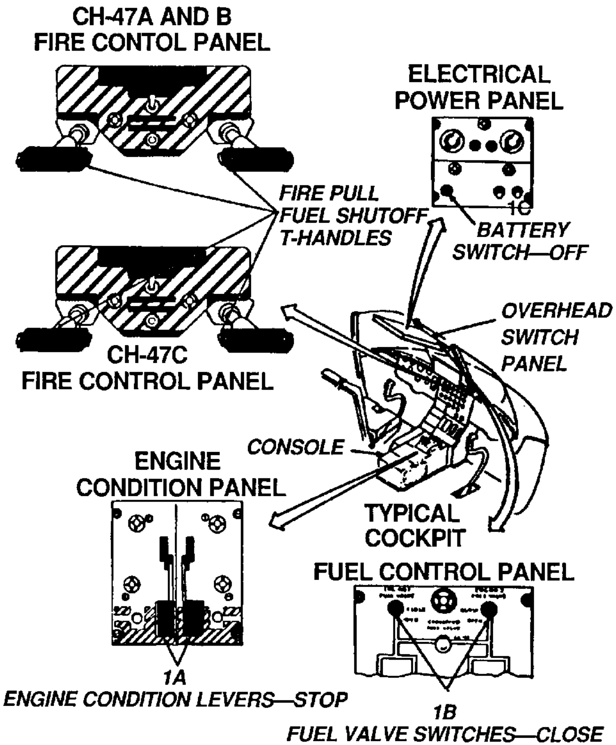
   B. POSITION FUEL VALVE SWITCHES, LOCATED ON OVERHEAD FUEL CONTROL PANEL, TO *CLOSE.*

   C. POSITION BATTERY SWITCH, LOCATED ON OVERHEAD ELECTRICAL CONTROL PANEL, TO *OFF.*

NOTE:
IF ENGINES FAIL TO SHUTDOWN, PULL FUEL SHUTOFF T-HANDLE, LOCATED AT TOP OF INSTRUMENT PANEL, OUT.

2. AIRCREW EXTRACTION

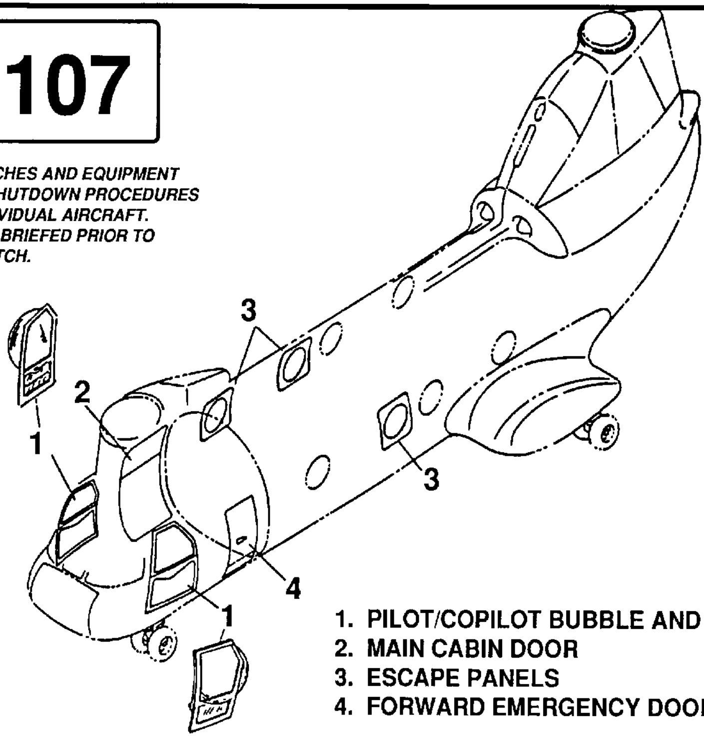
   A. UNLATCH SEAT BELTS AND REMOVE SHOULDER HARNESS FROM CREWMEMBER(S).



BOEING VERTOL CRASH RESCUE

BV-107

LOCATION OF SWITCHES AND EQUIPMENT AND EMERGENCY SHUTDOWN PROCEDURES MAY VARY FOR INDIVIDUAL AIRCRAFT. CREWS SHOULD BE BRIEFED PRIOR TO HELICOPTER DISPATCH.



1. **PILOT/COPILOT BUBBLE AND JETTISON WINDOWS**
2. **MAIN CABIN DOOR**
3. **ESCAPE PANELS**
4. **FORWARD EMERGENCY DOOR**

SEE BACK SIDE FOR EMERGENCY SHUTDOWN PROCEDURES

BOEING VERTOL EMERGENCY SHUTDOWN PROCEDURE

BV-107

THE FOLLOWING PROCEDURES WILL BE FOLLOWED IN THE EVENT OF FIRE OR OTHER EMERGENCY DURING HOT REFUELING:

1. **FUEL VALVES —CLOSED**
2. **BOOST PUMPS — OFF**
3. **ENGINE CONDITION LEVERS (ECLs) — STOP**
4. **PILOT & COPILOT EMERGENCY DOORS/BUBBLES — JETTISON**

(CONSIDER LOCATION OF FIRE DUE TO LOCATION OF REFUELING POINT BEFORE JETTISONING COCKPIT DOORS.)

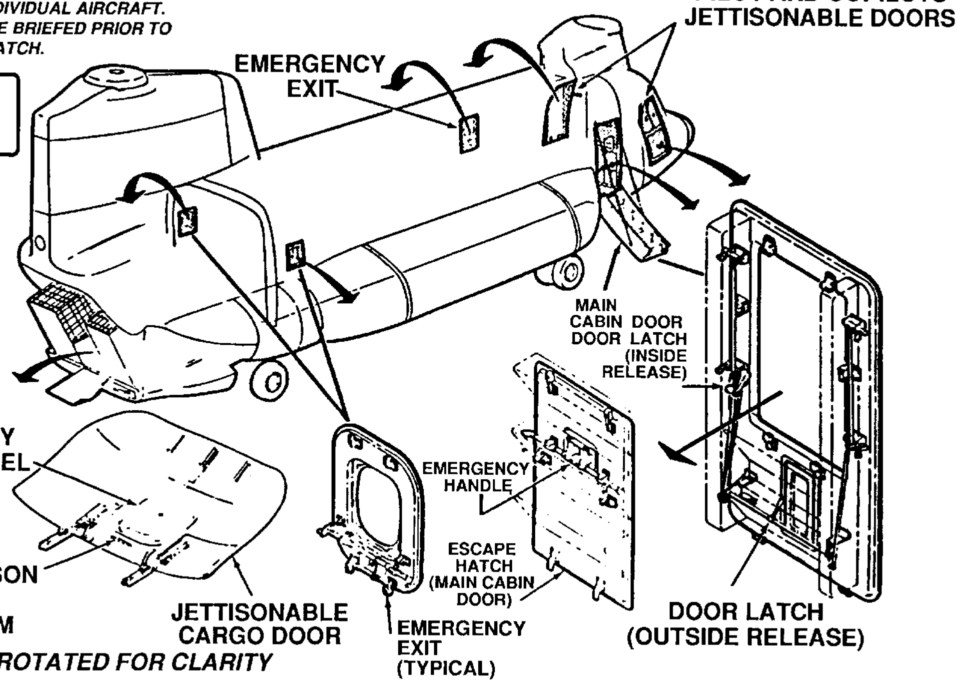
5. **AIRCRAFT — EVACUATE**
6. **FIRE EXTINGUISHER — DIRECT ON FIRE**

BOEING VERTOL

CRASH RESCUE

LOCATION OF SWITCHES AND EQUIPMENT AND EMERGENCY SHUTDOWN PROCEDURES MAY VARY FOR INDIVIDUAL AIRCRAFT. CREWS SHOULD BE BRIEFED PRIOR TO HELICOPTER DISPATCH.

234



SEE BACK SIDE FOR EMERGENCY SHUTDOWN PROCEDURES

BOEING VERTOL

EMERGENCY SHUTDOWN PROCEDURE

THE FOLLOWING PROCEDURES WILL BE FOLLOWED IN THE EVENT OF FIRE OR OTHER EMERGENCY DURING HOT REFUELING:

234

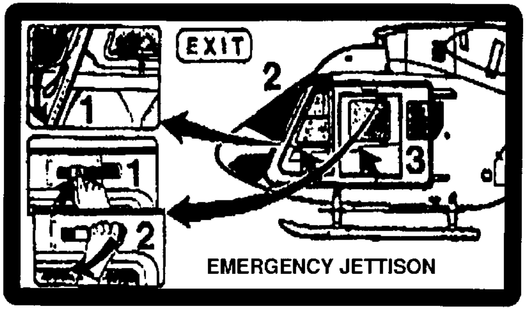
1. **ENGINE CONDITION LEVERS (ECLs) — STOP**
2. **T-HANDLES — PULL**
3. **BOOST PUMPS — OFF**
4. **PILOT & COPILOT EMERGENCY DOORS/BUBBLES — JETTISON**

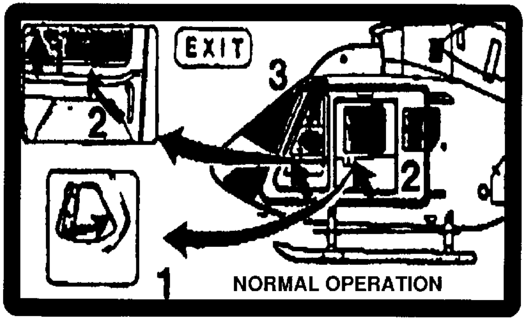
   (CONSIDER LOCATION OF FIRE DUE TO LOCATION OF REFUELING POINT BEFORE JETTISONING COCKPIT DOORS.)
5. **AIRCRAFT — EVACUATE**
6. **FIRE EXTINGUISHER — DIRECT ON FIRE**

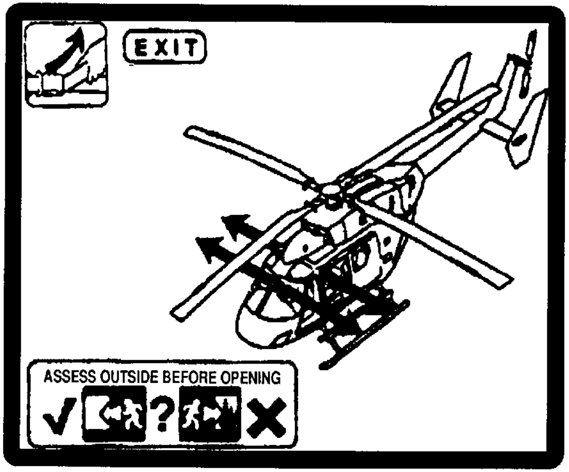
EUROCOPTER CRASH RESCUE

BK-117

LOCATION OF SWITCHES AND EQUIPMENT AND EMERGENCY SHUTDOWN PROCEDURES MAY VARY FOR INDIVIDUAL AIRCRAFT. CREWS SHOULD BE BRIEFED PRIOR TO HELICOPTER DISPATCH.







SEE BACK SIDE FOR EMERGENCY SHUTDOWN PROCEDURES

EUROCOPTER

EMERGENCY PROCEDURE/ ENGINE FIRE ON GROUND

BK-117

1. PASSENGERS — ALERT/EVACUATE
2. BOTH EMERGENCY FUEL VALVES — CLOSE
3. BOTH FUEL SUPPLY PUMPS — OFF
4. BOTH POWER LEVERS — OFF
5. BATTERY AND GENERATORS — OFF

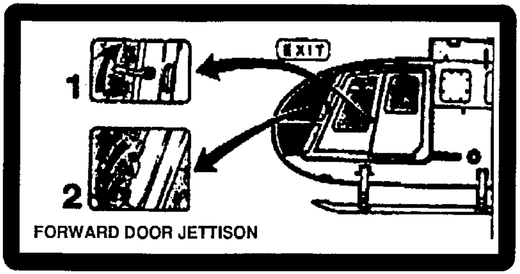
EXTINGUISH FIRE WITH HAND FIRE EXTINGUISHER

EUROCOPTER

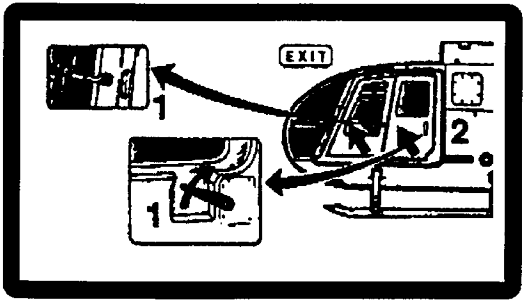
CRASH RESCUE

BO-105

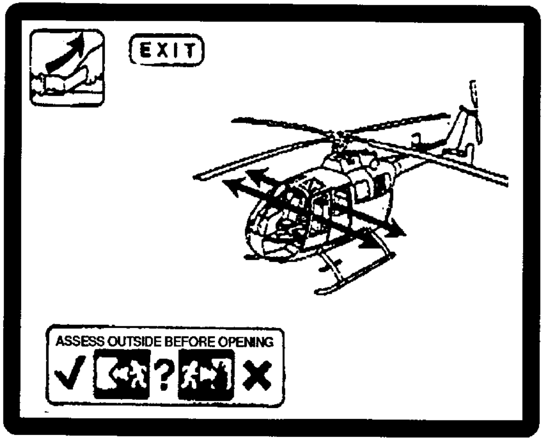
LOCATION OF SWITCHES AND EQUIPMENT AND EMERGENCY SHUTDOWN PROCEDURES MAY VARY FOR INDIVIDUAL AIRCRAFT. CREWS SHOULD BE BRIEFED PRIOR TO HELICOPTER DISPATCH.



EMERGENCY OPERATION



NORMAL OPERATION



SEE BACK SIDE FOR EMERGENCY SHUTDOWN PROCEDURES

EUROCOPTER

EMERGENCY PROCEDURE/ ENGINE FIRE ON GROUND

BO-105

1. PASSENGERS — ALERT/EVACUATE
2. BOTH EMERGENCY FUEL VALVES — CLOSE
3. BOTH FUEL SUPPLY PUMPS — OFF
4. BOTH POWER LEVERS — OFF
5. BATTERY AND GENERATORS — OFF

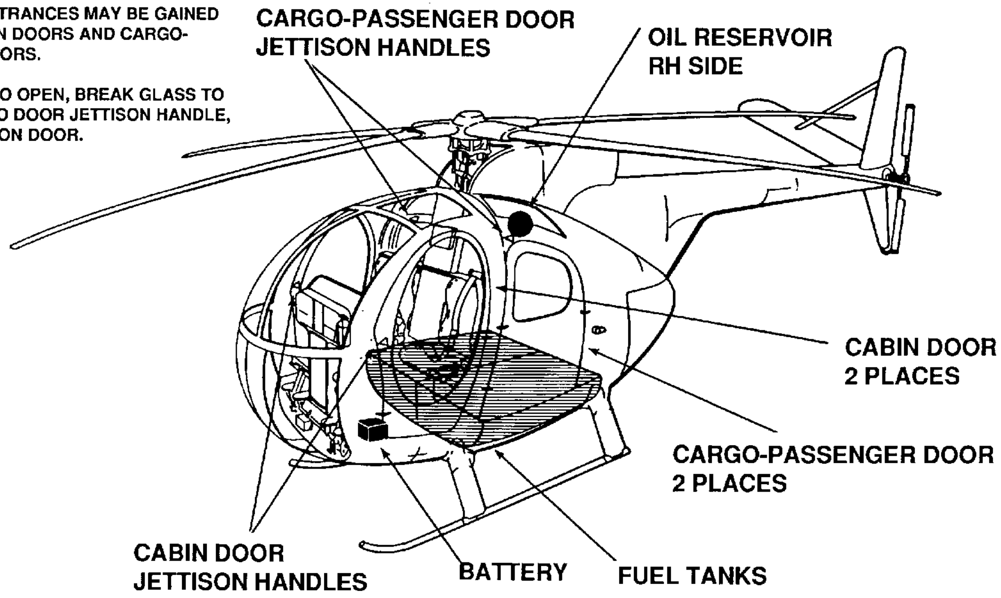
EXTINGUISH FIRE WITH HAND FIRE EXTINGUISHER

McDONNELL DOUGLAS (HUGHES) CRASH RESCUE

500-C,D (OH-6)

LOCATION OF SWITCHES AND EQUIPMENT AND EMERGENCY SHUTDOWN PROCEDURES MAY VARY FOR INDIVIDUAL AIRCRAFT. CREWS SHOULD BE BRIEFED PRIOR TO HELICOPTER DISPATCH

- EMERGENCY ENTRANCES MAY BE GAINED THROUGH CABIN DOORS AND CARGO-PASSENGER DOORS.
- IF DOORS FAIL TO OPEN, BREAK GLASS TO GAIN ACCESS TO DOOR JETTISON HANDLE, PULL TO JETTISON DOOR.



SEE BACK SIDE FOR EMERGENCY SHUTDOWN PROCEDURES

McDONNELL DOUGLAS (HUGHES)

ENGINE SHUTDOWN & AIRCREW EXTRACTION

500-C,D (OH-6)

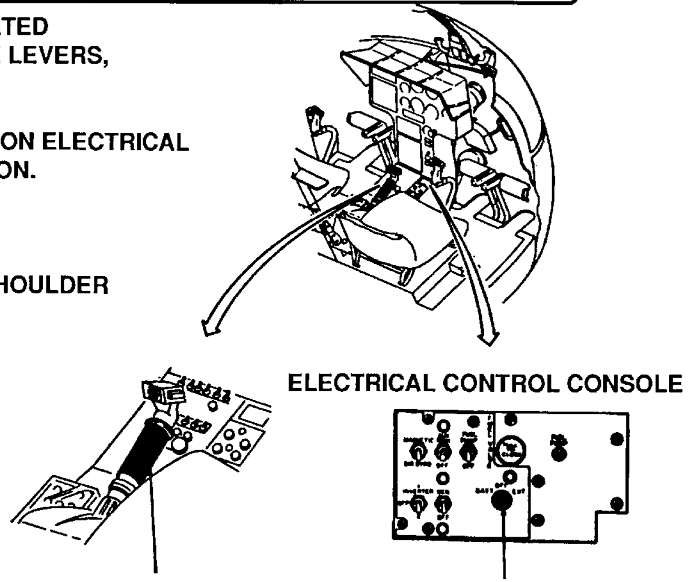
1. ENGINE SHUTDOWN

   A. ROTATE THROTTLE CONTROL, LOCATED ON PILOT AND COPILOT COLLECTIVE LEVERS, TO *FUEL CUT-OFF* POSITION.

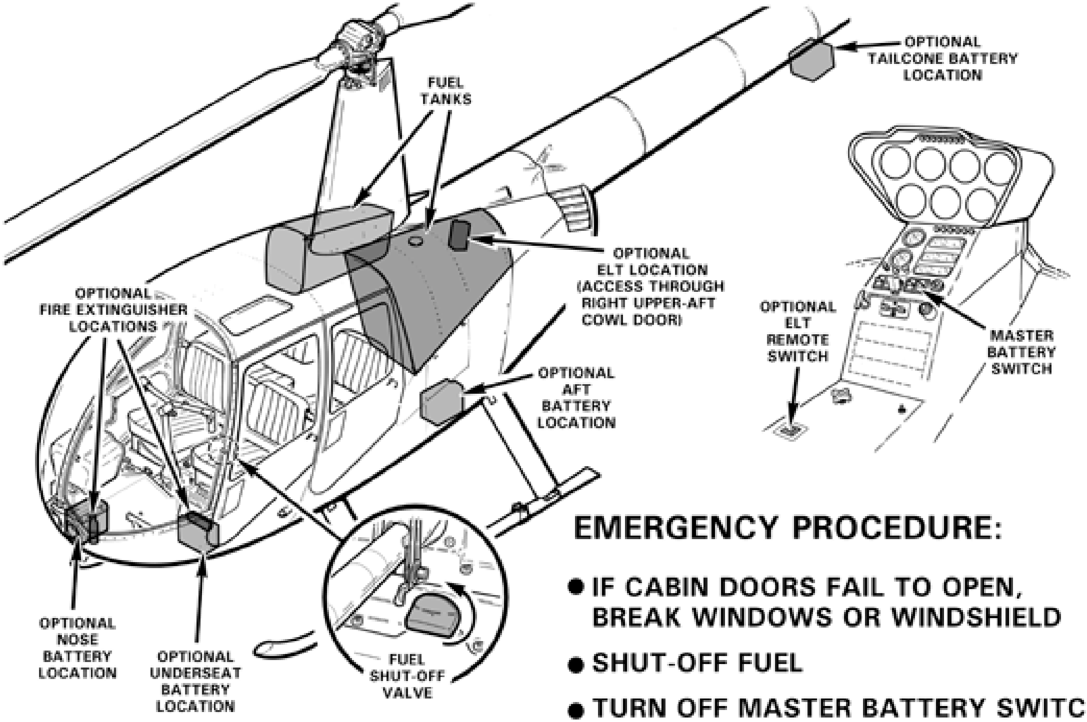
   B. PLACE BATTERY SWITCH, LOCATED ON ELECTRICAL CONTROL CONSOLE, TO *OFF* POSITION.

2. AIRCREW EXTRACTION

   A. UNLATCH LAP BELT AND REMOVE SHOULDER HARNESS FROM CREWMEMBER(S).



ROBINSON MODEL R44 & R44 II CRASH RESCUE DIAGRAM



EMERGENCY PROCEDURE:

- IF CABIN DOORS FAIL TO OPEN, BREAK WINDOWS OR WINDSHIELD
- SHUT-OFF FUEL
- TURN OFF MASTER BATTERY SWITCH

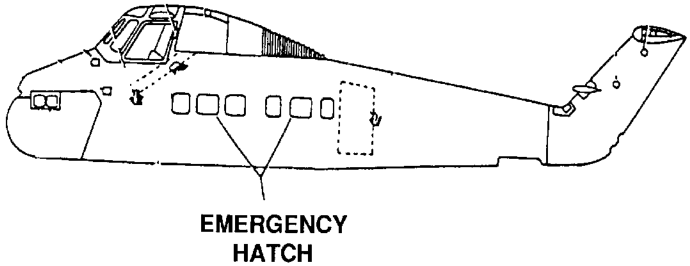
SIKORSKY

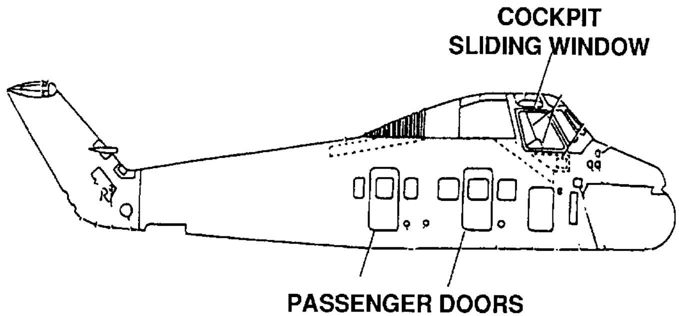
CRASH RESCUE

S-58T

LOCATION OF SWITCHES AND EQUIPMENT AND EMERGENCY SHUTDOWN PROCEDURES MAY VARY FOR INDIVIDUAL AIRCRAFT. CREWS SHOULD BE BRIEFED PRIOR TO HELICOPTER DISPATCH.

COCKPIT SLIDING WINDOWS, CARGO DOORS, PASSENGER DOORS AND EMERGENCY ESCAPE HATCHES CAN BE JETTISONED BY PULLING APPROPRIATE EMERGENCY RELEASE HANDLES.



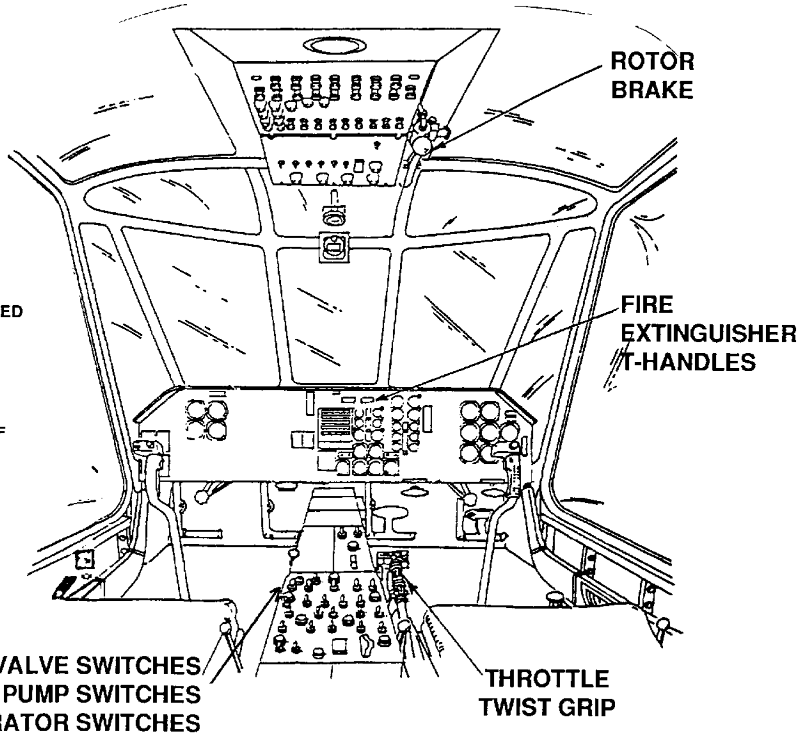


SEE BACK SIDE FOR EMERGENCY SHUTDOWN PROCEDURES

SIKORSKY EMERGENCY SHUTDOWN PROCEDURE

S-58T

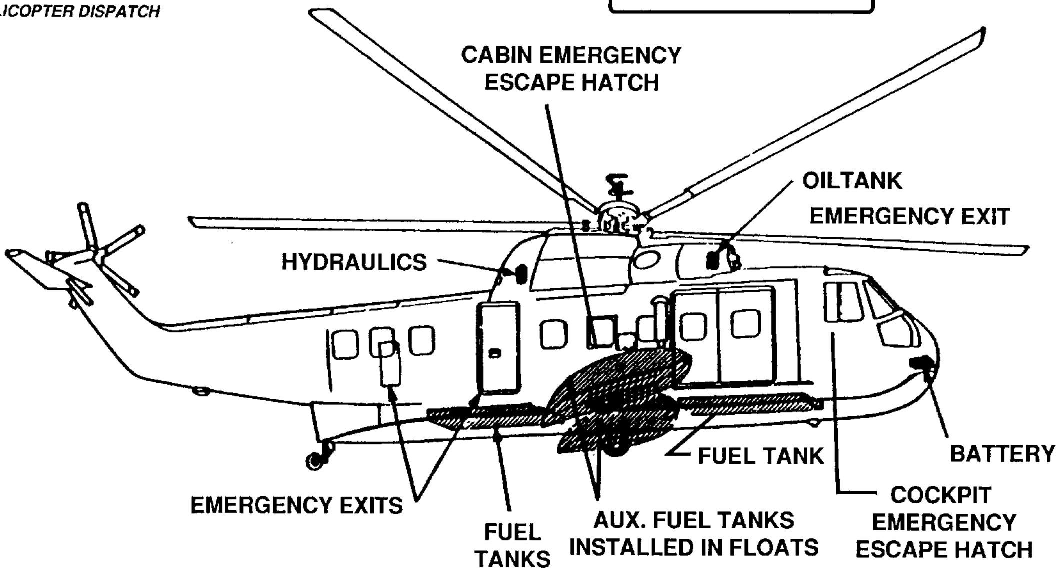
1. THROTTLE TWIST GRIP—OFF
   (CONTROL STICK RIGHT OF CENTER CONSOLE)
2. FUEL SHUTOFF VALVE SWITCHES—CLOSED
   (CENTER CONSOLE)
3. FUEL BOOST PUMP SWITCHES—OFF
   (CENTER CONSOLE)
4. BATTERY & GENERATOR SWITCHES—OFF
   (CENTER CONSOLE)
5. ROTOR BRAKE—ON
   IF ROTOR BLADES ARE TURNING
   (RIGHT OF OVERHEAD SWITCH PANEL)
   RED HANDLE—PULL DOWN & FORWARD



SIKORSKY CRASH RESCUE

LOCATION OF SWITCHES AND EQUIPMENT AND EMERGENCY SHUTDOWN PROCEDURES MAY VARY FOR INDIVIDUAL AIRCRAFT. CREWS SHOULD BE BRIEFED PRIOR TO HELICOPTER DISPATCH

S-61N



SEE BACKSIDE FOR EMERGENCY SHUTDOWN PROCEDURES

SIKORSKY ENGINE SHUTDOWN & AIRCREW EXTRACTION

S-61N

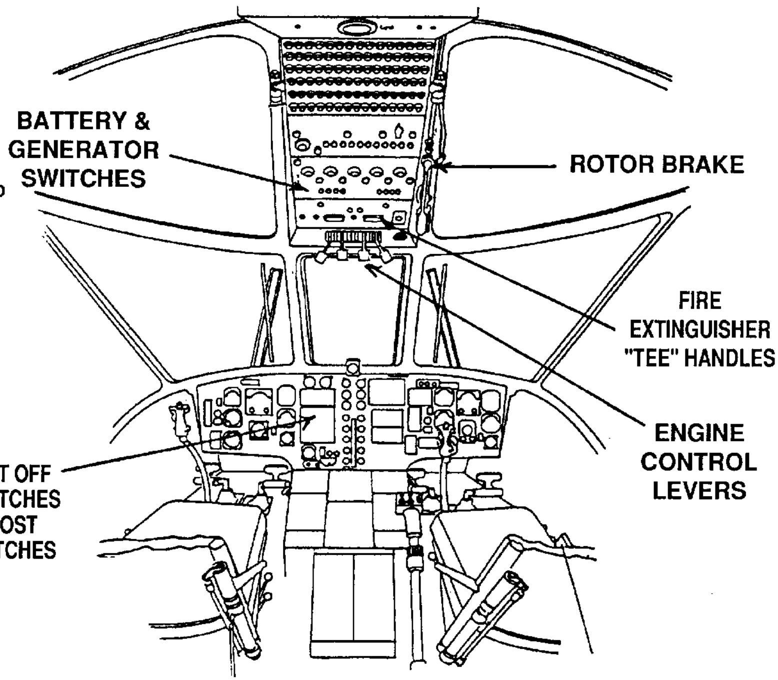
1. ENGINE CONTROL LEVERS—OFF (CENTER OVERHEAD—FORWARD) PULL AFT, THEN DOWN TO CLEAR DETENT AT END OF ARC.

2. FUEL SHUT OFF VALVE SWITCHES—CLOSED (CENTER OF INSTRUMENT PANEL)

3. FUEL BOOST PUMP SWITCHES—OFF (CENTER OF INSTRUMENT PANEL)

4. BATTERY & GENERATOR SWITCHES—OFF (OVERHEAD SWITCH PANEL)

5. ROTOR BRAKE—ON IF ROTOR BLADES ARE TURNING (RIGHT OF OVERHEAD SWITCH PANEL) RED HANDLE—PULL DOWN & FORWARD.



SIKORSKY CRASH RESCUE

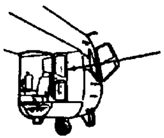
S-64 (CH-54)

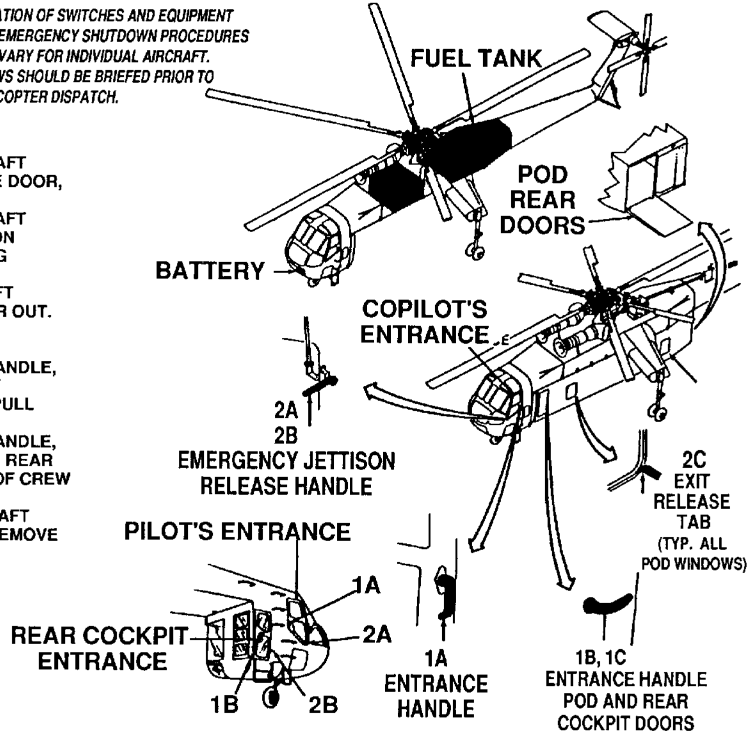
LOCATION OF SWITCHES AND EQUIPMENT AND EMERGENCY SHUTDOWN PROCEDURES MAY VARY FOR INDIVIDUAL AIRCRAFT. CREWS SHOULD BE BRIEFED PRIOR TO HELICOPTER DISPATCH.

1. NORMAL ENTRY
   A. ROTATE ENTRANCE HANDLE, LOCATED ON AFT EDGE OF PILOT'S AND COPILOT'S ENTRANCE DOOR, SWING DOOR OUT.
   B. ROTATE ENTRANCE HANDLE, LOCATED ON AFT EDGE OF REAR COCKPIT ENTRANCE DOOR ON RIGHT SIDE OF CREW COMPARTMENT, SWING DOOR OUT.
   C. ROTATE ENTANCE HANDLE, LOCATED ON AFT EDGE OF POD ACCESS DOORS, SWING DOOR OUT.

2. EMERGENCY ENTRY
   A. ROTATE ENERGENCY JETTISON RELEASE HANDLE, LOCATED AT FORWARD LOWER CORNER OF PILOT'S AND COPILOT'S ENTRANCE DOOR, PULL DOOR OUT.
   B. ROTATE ENERGENCY JETTISON RELEASE HANDLE, LOCATED AT FORWARD LOWER CORNER OF REAR COCKPIT ENTRANCE DOOR ON RIGHT SIDE OF CREW COMPARTMENT, PULL DOOR OUT.
   C. PULL EXIT RELEASE TAB, LOCATED LOWER AFT CORNER OF EACH POD WINDOW, OUT AND REMOVE WINDOW.

3. CUT-IN
   A. CUT AROUND WINDOWS AND ACCESS DOORS OF POD AS MARKED.





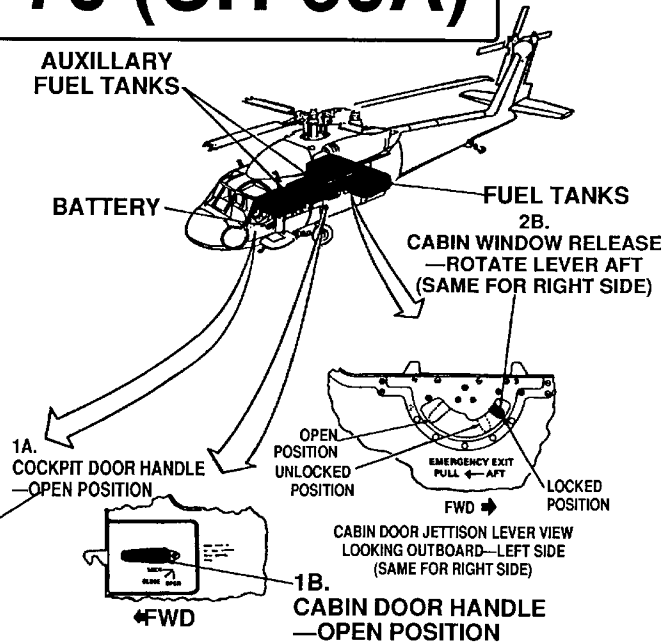
SIKORSKY CRASH RESCUE

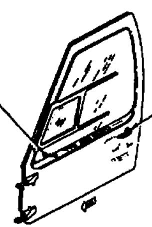
S-70 (UH-60A)

LOCATION OF SWITCHES AND EQUIPMENT AND EMERGENCY SHUTDOWN PROCEDURES MAY VARY FOR INDIVIDUAL AIRCRAFT. CREWS SHOULD BE BRIEFED PRIOR TO HELICOPTER DISPATCH.

AIRCRAFT ENTRY—ALL MODELS

1. NORMAL ENTRY
   A. TURN COCKPIT DOOR COUNTERCLOCKWISE TO THE OPEN POSITION TO OPEN DOOR.
   B. TURN CABIN DOOR COUNTERCLOCKWISE TO THE OPEN POSITION AND SLIDE DOOR AFT.
2. EMERGENCY ENTRY
   A. BREAK WINDOW IN COCKPIT DOOR AND PULL JETTISON LEVER AFT TO RELEASE DOOR HINGES.
   B. BREAK WINDOW IN CABIN DOOR AND ROTATE EMERGENCY HANDLE, LOCATED BELOW EACH WINDOW, TO THE AFT OPEN POSITION. ROTATE BOTTOM OF WINDOW OUT TO REMOVE WINDOW.

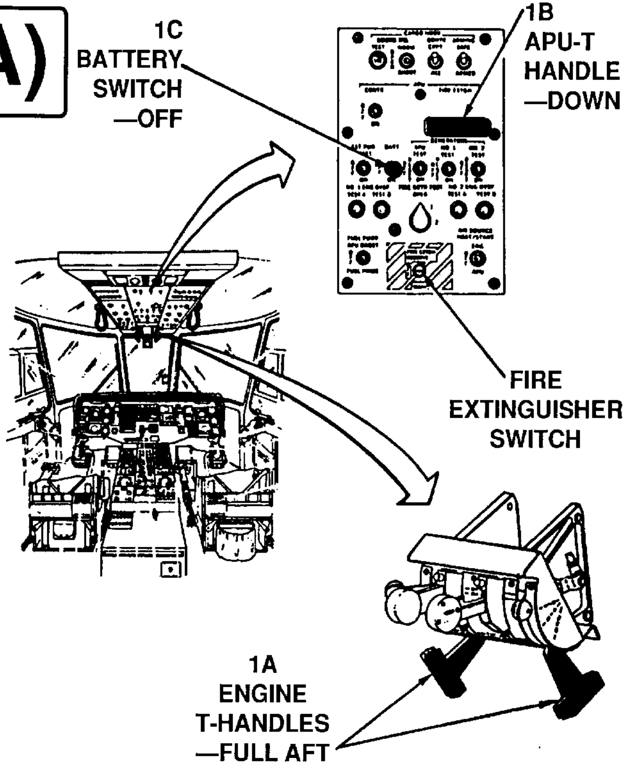




SEE BACK SIDE FOR EMERGENCY SHUTDOWN PROCEDURES

SIKORSKY ENGINE SHUTDOWN & AIRCREW EXTRACTION

S-70 (UH-60A)



1. **ENGINE SHUTDOWN**
   NOTE: TO ACTIVATE THE INSTALLED FIRE EXTINGUISHING SYSTEM, ONE (T) HANDLE MUST BE PULLED. AGENT IS DISCHARGED TO LAST (T) HANDLE PULLED. THEN REPOSITION THE FIRE EXTINGUISHER SWITCH FROM OFF TO MAIN OR RESERVE. BATTERY SWITCH MUST BE IN THE ON POSITION.
   - **A. PULL ENGINE EMERGENCY (T) HANDLES, LOCATED ON CONTROL QUADRANT, FULL AFT.**
   - **B. PULL APU (T) HANDLE LOCATED ON UPPER CONSOLE, DOWN.**
   - **C. PLACE BATTERY SWITCH, LOCATED ON UPPER CONSOLE, TO THE OFF POSITION.**
2. **AIRCREW—TROOP EXTRACTION**
   NOTE: ALL AIRCREW SEATS HAVE A COMPLETE LAP BELT AND DUAL TORSO RESTRAINT SHOULDER HARNESS ATTACHED TO A ROTARY RELEASE BUCKLE.

   ALL TROOP SEATS HAVE A LAP BELT AND SHOULDER HARNESS ATTACHED TO A ROTARY RELEASE BUCKLE.

-A-

Abeam: An aircraft is “abeam” a fix, point, or object when that fix, point, or object is approximately 90 degrees to the right or left of the aircraft track. Abeam indicates a general position rather than a precise point.

Abort: To terminate a preplanned aircraft maneuver, for example, an aborted takeoff.

Above Ground Level (AGL): See Altitude.

Above Surface Level (ASL): The distance between the aircraft and the nearest surface.

ABRO: ICS mnemonic for the Aircraft Base Radio Operator.

ACETA: See Aerial Capture, Eradication, And Tagging of Animals.

Acknowledge: To let one know that one has received and understood another’s message.

Actual Time Of Arrival (ATA): Term used in flight planning and flight following to document the time of arrival at a point.

Actual Time Of Departure (ATD): Term used in flight planning and flight following to document the actual time of departure from a given point.

Actual Time Enroute (ATE): Term used in flight planning and flight following to document the actual time spent flying from one point to another.

ADF: See Automatic Direction Finder.

Advancing Blade: That half of the rotor disc in which the rotation of the blade is moving in the same direction as the movement of the helicopter.

Advisory: Advice and information provided to assist a Pilot in the safe conduct of flight and aircraft movement.

Aerial Capture, Eradication, And Tagging of Animals: USDI Handbook that outlines policy and procedures for these types of operations.

Affirmative: Yes

Aft: Rearward; in the back.

AGL: See Above Ground Level.

Agreement Aircraft: An aircraft that is approved and available for intermittent, short-term use under an ordering or rental agreement. Orders for use of the agreement aircraft are subject to the small purchase limitation established under the Federal Acquisition Regulations unless otherwise authorized by the Contracting Officer.

Air Crew Member: Additional crew member required for accomplishment of the mission such as flight attendant, smokejumper/rappel spotter, cargo loadmaster, helicopter manager, etc. These positions usually do not require any Airman Certificate(s) or flight physical.

Air Guard: A common frequency preset into each 9600 channel radio. The air guard frequency is 168.625 MHz.

Air Operations Branch Director (AOBD): The supervisor of the air operations staff on an incident or project. The Air Tactical Group Supervisor and Air Support Group Supervisor work for the AOBD; the AOBD works for the Operations Section Chief or Project Aviation Manager. (See the aviation table of organization in Chapter II for further information.)

Air Route Traffic Control Center (ARTCC): Major FAA radar centers established to provide air traffic control service to aircraft operating on IFR (Instrument Flight Rules) flight plans within controlled airspace and principally during the en route phase of flight. Each ARTCC has an assigned geographical area. Refer to the Interagency Airspace Coordination Guide for further discussion of the role ARTCC's play in the National Airspace System.

Air Support Group Supervisor (ASGS): The supervisor of the Air Support staff on an incident or project. The ASGS supervises the Helibase Manager(s) and is responsible for support from fixed-wing bases; the ASGS works for the Air Operations Branch Director. (See the aviation table of organization in Chapter II for further information.)

Air Traffic Control (ATC): A service operated by appropriate authority to promote the safe, orderly, and expeditious flow of air traffic.

Air Tactical Group Supervisor (ATGS): The supervisor of the Air Tactics staff on an incident or project. The ATGS supervises the Air Tanker and Helicopter Coordinators and is responsible for tactical coordination of aircraft; the ATGS works for the Air Operations Branch Director. (See the aviation table of organization in Chapter II for further information.)

Aircraft: The term aircraft is used to refer to both airplanes and helicopters.

Aircraft Accident: An unplanned event that does substantial damage or causes serious injuries when associated with the operation of applicable aircraft, occurring between the time the engine(s) is (are) started or rotors turning for the purpose of commencing flight, until the aircraft comes to rest with engines and propellers or rotors stopped, and the brakes set or wheel chocks in place and all persons have disembarked.

Aircraft Base Radio Operator (ABRO): The Aircraft Base Radio Operator is supervised by the Helibase Manager and is responsible for establishing and facilitating communications among incident- or project-assigned helicopters, helibases, helispots, air operations staff or Project Aviation Manager, and the Takeoff And Landing Coordinator. Note that on smaller incidents or projects that this position may be combined with the Aircraft Timekeeper position. See Chapter 2.

Aircraft Chief-of-Party: The government representative responsible for coordinating with the Pilot concerning mission planning, needs and conduct. This individual may be a helicopter manager, authorized crew member, rappel spotter, etc. See **Project Flight Manager**.

Aircraft Data Card: "Card" or documentation required to be onboard the helicopter that approves the aircraft for use, and the types of use. Example of carding for specific uses include: long line, helitorch, and passenger transport. Cards are issued by USDI, USDA-Forest Service, and various State agencies.

Aircraft Ground Mishap: An aircraft mishap in which there is no intent to fly; however, the power plants and/or rotors are in operation and damage incurred requiring replacement or repair of rotors, propellers, wheels, tires, wing tips, flaps, etc., or an injury is incurred requiring first-aid or medical attention.

Aircraft Incident: An unplanned event that results in damage which is less than serious aircraft incident criteria, or injury less than medical attention (that is, first aid). A situation involving an aircraft and/or personnel which has the potential of resulting in an aircraft accident is also classified as an aircraft incident. Examples include a forced or precautionary landing, an aircraft ground mishap or ground damage to an aircraft, and a near mid-air collision.

Aircraft Rental Agreement (ARA): For USDI, a written instrument of understanding, negotiated between an agency, contracting activity, or contracting office and a contractor, that contains (1) terms and clauses applying to future contracts (orders) between the parties during its term; (2) a description, as specific as practicable, of supplies or services to be provided; and (3) methods for pricing, issuing, and delivering future orders under the Aircraft Rental Agreement. An Aircraft Rental Agreement is not a contract. In this guide, may be used interchangeably with "rental" or "call-when-needed."

Aircraft Timekeeper (ATIM): The Aircraft Timekeeper is supervised by the Helibase Manager and is responsible for keeping time and other information concerning all helicopters assigned to the helibase. Note that on smaller incidents or projects that this position may be combined with the Aircraft Base Radio Operator position. See Chapter 2.

Airfoil: Any surface designed to obtain a useful reaction from the air through which it moves.

Airman's Information Manual: A publication containing basic flight information and ATC procedures designed primarily as a Pilot's instructional manual for the use of the national airspace system. May be called the FAR/AIM when selected Federal Aviation Regulations (FAR's) are included.

Airport/Facility Directory (A/FD): A publication designed primarily as a Pilot's operational manual containing all airports, seaplane bases, and heliports open to the public including communications data, navigational facilities, and certain special notices and procedures. This publication is issued in seven volumes according to geographical area.

Airspeed: The speed of an aircraft relative to its surrounding air mass. The unqualified term "airspeed" means one of the following:

1. **Indicated Airspeed**: The speed shown on the aircraft airspeed indicator. This is the speed used in Pilot/controller communications under the general term "airspeed" (refer to FAR 1).

2. **True Airspeed:** The airspeed of an aircraft relative to undisturbed air. It is used primarily in flight planning and the en route portion of flight. When used in Pilot/controller communications, it is referred to as "true airspeed" and not shortened to "airspeed."

Airway: A control area or portion thereof established in the form of a corridor, the centerline of which is defined by radio navigational aids. See **Charted VFR Flyways**.

All Risk: Emergency operations of all types, including but not limited to floods, hurricanes, hazardous materials spills, volcanic eruptions, fires, etc.

Allowable Payload: The allowable payload represents the amount of weight that is available for passengers and/or cargo. On the load calculation form, the allowable payload is the operating weight subtracted from the selected weight.

ALSE: See Aviation Life Support Equipment.

Altimeter Setting: The barometric pressure reading used to adjust a pressure altimeter for variations in existing atmospheric pressure or to the standard altimeter setting (29.92 inches).

Altitude: The height of a level point or object measured in feet **Above Ground Level (AGL)** or from **Mean Sea Level (MSL).**

1. MSL Altitude: Altitude in feet measured from mean sea level.

2. AGL Altitude: Altitude in feet measured from above ground level, that is, the vertical height of the aircraft above the ground. See **Above Surface Level**.

3. **Indicated Altitude:** The altitude as shown by an altimeter. On a pressure or barometric altimeter it is altitude as shown uncorrected for instrument error and uncompensated for variation from standard atmospheric conditions.

AMD-23: Aircraft Use Report utilized by USDI agencies to record flight and other payment items for vendor aircraft.

Angle Of Attack: The acute angle measured between the chord of an airfoil and the relative wind.

Antitorque Rotor: See Tail Rotor.

AOBD: See Air Operations Branch Director.

Approach-Departure Path: The clear path selected for flight extending upward and outward from the touchdown pad and safety circle. The approach and departure path should not overfly structures, inhabited areas, personnel, and vehicle parking areas. See Chapter 8 for recommended specifications.

APU: Auxiliary Power Unit

Aramide: See Nomex.

Articulated Rotor: A rotor system in which the blades are free to flap, drag (hunt), and feather. See Rigid Rotor and Semirigid Rotor.

ASGS: See Air Support Group Supervisor.

ASL: See Above Surface Level.

ATA: See Actual Time of Arrival.

ATC: See Air Traffic Control

ATD: See Actual Time of Departure.

ATE: See Actual Time Enroute.

ATGS: See Air Tactical Group Supervisor.

ATIM: ICS mnemonic for the Aircraft Timekeeper.

Authorized Passenger: Passengers may be transported in government aircraft only if they meet definition of an Official or an Unofficial Passenger. See Unauthorized Passenger. See Official Passenger.

Autorotation: A rotorcraft flight condition in which the lifting rotor is driven entirely by action of the air when the rotorcraft is in motion. No engine power is supplied to the main rotor, and lift is developed from the free turning of the rotor blades, which are driven by aerodynamic forces. Rotor inertia is used as the helicopter nears the ground to check the descent.

Automatic Direction Finder (ADF): An aircraft navigation system which senses and indicates the direction to a low/medium frequency nondirectional radio beacon (NDB) ground transmitter. Direction is indicated to the Pilot as a magnetic bearing or as a relative bearing to the longitudinal axis of the aircraft, depending upon the type of indicator installed.

Aviation Hazard: Any condition, act or set of circumstances that compromises the safety of personnel or resources engaged in aviation activities. These hazards include inadequacies, deficiencies or unsafe practices pertaining to all aspects of aviation operation and activities.

Aviation Life Support Equipment (ALSE): This includes PPE, and other items like Personnel flotation devices/vests, oxygen units, survival vests.

Aviation Management Directorate (AMD): Office in the Department of the Interior's Denver Service Center with departmental wide functions related to aircraft services, aircraft contracting, training, and facilities.

Aviation Mishap: An unplanned, unintended event involving aircraft operations that results in damage to aircraft, injuries to personnel, or presents the potential for such. Mishaps include aircraft accidents, serious aircraft incidents, aircraft incidents, aviation hazards, and aircraft maintenance deficiencies.

Aviation Management Information System (AMIS): Information system operated by USDA and USDI that collects and collates accident, incident, hazard, and maintenance deficiency statistics through submission of SAFECOM - Aviation Safety Communiqué OAS-34/FS 5700-14.

Aviation Mishap Information System (AMIS): Information system operated by USDI that collects and collates accident, incident, hazard, and maintenance deficiency statistics through submission of AMD-34 Safecom Reports.

Azimuth: A magnetic bearing extending from a Microwave Landing System navigation facility. Azimuth bearings are described as magnetic and are referred to as "azimuth" in radio telephone communications. See Bearing.

-B-

Bailed Aircraft: Aircraft on loan from the Department of Defense (DOD).

Base Leg: See Traffic Pattern.

Bearing: The horizontal direction to or from any point, usually measured clockwise from true north, magnetic north, or some other reference point through 360 degrees.

Below Minimums: Weather conditions below the minimums prescribed by regulation for the particular action involved (for example, landing minimums, takeoff minimums, VFR flight minimums).

Blade Damper: A device (spring, friction, or hydraulic) installed on the vertical (drag) hinge to diminish or dampen blade oscillation (hunting) around the hinge.

Blade Hunting: The tendency of a blade (due to coriolis effect) to seek a position ahead of or behind that which would be determined by centrifugal force alone.

Blade Loading: The load placed on the rotor blades of a helicopter, determined by dividing the gross weight of the helicopter by the combined area of all the rotor blades.

Blade Stall: The stall condition on the retreating blade which occurs at high forward speeds.

Blind Spot: An area from which radio transmissions and/or radar echoes cannot be received.

Blind Transmission: A transmission from one station to another station or stations in circumstances where two-way communication cannot be established but where it is believed that the called station(s) may be able to receive the transmission.

BLM: See Bureau of Land Management.

Blivet: Container for liquids (water, fuel, etc.) that is helicopter-transportable. Also known as a water bag.

Broadcast: Transmission of information for which an acknowledgement is not expected.

Bucket: A rigid, collapsible, or collapsible-foldable container slung below a helicopter, usually to transport water, foam, or retardant.

Bureau: Generic reference to the Offices, Bureaus, Surveys, or Services in USDI.

Bureau of Land Management (BLM): Agency in the United States Department of the Interior.

-C-

Call-When-Needed (CWN): See Aircraft Rental Agreement. In this guide, may be used interchangeably with “rental” or “ARA”.

Call Up: Initial voice contact between a facility and an aircraft, using the identification of the unit being called and the unit initiating the call.

Cardinal Altitudes: “Odd” or “Even” thousand-foot altitudes or flight levels (for example, 5000, 7000, FL260).

Cargo Freefall: Delivery of cargo by dropping it out of the helicopter without a parachute.

Cargo Hook: Term commonly used to identify the load-carrying device mounted beneath the helicopter to which external cargo is attached. Cargo hooks usually have both manual and electrical quick-release mechanisms operated by the Pilot.

Cargo Letdown: The method of lowering cargo from a hovering helicopter using a letdown line or rope controlled by a “Figure 8” device.

Cargo Net: A net used in external load operations.

Cargo Rack Or Basket: A structure attached externally to a helicopter for transport of cargo.

Carousel Hook: The carousel system is a remote hook attached to the end of a longline. It has four or more individual hooks contained within the carousel. Each hook can be independently released, allowing the Pilot to fly different cargo loads to different locations without landing.

Category: As used with respect to certification of aircraft, means a grouping of aircraft based upon intended use or operating limitations. Examples include: transport, normal, utility, acrobatic, limited, restricted, and provisional.

CCR: See Closed Circuit Refueling.

Ceiling: The heights above the earth's surface of the lowest layer of clouds or obscuring phenomena that is reported as "broken," "overcast," or "obscuration," and not classified as "thin" or "partial."

Center Of Gravity (CG): An imaginary point where the resultant weight forces in the body may be considered to be concentrated for any position of the body. Consideration of center of gravity limitations is important in the loading of all aircraft, but it is particularly important and critical in helicopters. In an airplane, the load is balanced over a horizontal wing area and has comparatively wide range. In a single main rotor helicopter, it is carried under a single point, like a pendulum. Therefore, very little out-of-CG loading can greatly affect the controllability of the helicopter.

Center Of Pressure: The imaginary point on the chord line where the resultant of all aerodynamic forces of an airfoil section may be considered to be concentrated.

Centrifugal Force: The force created by the tendency of a body to follow a straight-line path against the force which causes it to move in a curve, resulting in a force which tends to pull away from the axis of rotation.

Certificated Gross Weight: See Maximum Certificated Gross Weight.

CFR: See Code of Federal Regulations

CG: See Center of Gravity.

Charted VFR Flyways: Charted VFR Flyways are flight paths recommended for use to bypass areas heavily traversed by large turbine-powered aircraft. Pilot compliance with recommended flyways and associated altitudes is strictly voluntary. VFR Flyway Planning charts are published on the back of existing VFR Terminal Area charts.

Chase Truck: Helicopter crew vehicle, also known as a "helitender," that carries crew gear, supplies, and operational equipment for initial/extended attack and helispot/helibase operations.

Chord: An imaginary straight line between the leading and trailing edges of an airfoil.

Civil Aircraft: Aircraft that are not public aircraft.

Closed Circuit Refueling (CCR): A fueling system designed to prevent spills, minimize fuel contamination, and prevent escape of flammable fuel vapors. See Chapter 13.

CO: Contracting Officer.

Code of Federal Regulations (CFR's): That body of regulations contained in the United States Code (USC).

Collective Pitch Control: The method of control by which the pitch of all rotor blades is varied equally and simultaneously. The collective regulates the pitch angle, or angle of attack, of the main rotor blades. It is used as the primary power control. As the pitch of the blades is increased, lift is induced, causing the helicopter to lift off the ground, hover, or climb, as long as sufficient power is available.

Common Traffic Advisory Frequency (CTAF): A frequency designed for the purpose of carrying out airport advisory practices while operating to and from an uncontrolled airport. The CTAF may be a UNICOM, Multicom, FSS, or tower frequency and is identified in appropriate aeronautical publications.

Compass Rose: A circle, graduated in degrees, printed on some charts or marked on the ground at an airport or heliport. It is used as a reference to either true or magnetic direction.

Computed Gross Weight: See Maximum Computed Gross Weight.

Contact: Establish communication with (followed by the name of the facility and, if appropriate, the frequency to be used).

Contract Aircraft: An aircraft that has been approved for use by a formal contract. Generally, there is no monetary limitation on the extent of use of the contract aircraft. Contract aircraft may be either **Exclusive-Use Contract** or **On-Call Contract** aircraft.

> **Exclusive-Use Contract Aircraft:** An aircraft contracted for a specified period during which time it is under the exclusive use and control of the government. It may be released from the contract only through authorization by the Contracting Officer.

> **On-Call Contract:** An aircraft contracted for a specified number of hours but which is not under the exclusive use and control of the government until the time of order (there may be a penalty incurred by the vendor for not meeting the order).

Contracting Officer (CO) or Administrative Contracting Officer (ACO): The Contracting Officer (CO in DOI) or Administrative Contracting Officer (ACO in USDA-FS) is responsible for all contracting actions including contracting procedures and methods, contract legality, compliance with existing laws and regulations, contract administration and terminations. The CO may delegate certain contract administration functions.

Contracting Officer's Representative (COR): The Contracting Officer's Representative (COR) is directly responsible to the Contracting Officer for monitoring contract performance. The COR is primarily responsible for assuring compliance with the administrative provisions of the contract. The COR maintains communications with the vendor concerning day-to-day operations, though this may be further delegated to a Project Inspector (see below). The COR may represent the CO in making minor allowances which do not modify the price, or other provisions of the contract. The COR is responsible for verifying the work performed upon which payment is based. Responsibilities may be further delegated to a Project Inspector (PI).

Contracting Officer's Technical Representative (COTR): The Contracting Officer's Technical Representative (COTR) is directly responsible to the Contracting Officer for assuring compliance with the technical provisions of the contract. The COTR conducts initial inspections and approves the vendor's equipment, facilities, and personnel prior to, and periodically during, contract performance.

Controlled Airspace: Airspace within which some or all aircraft may be subject to air traffic control (see FAR 71 and/or the FAR/AIM).

Coordinates: The intersection of lines of reference, usually expressed in degrees/minutes/seconds of latitude and longitude, used to determine or report position or location.

Copter: Helicopter

COR: See Contracting Officer's Representative

Correction: An error has been made in the transmission and the correct version follows.

COTR: See Contracting Officer's Technical Representative

Course: The intended direction of flight in the horizontal plane measured in degrees from north. See Bearing and Radial.

Crashed Aircraft: A crashed aircraft is one that is known or is suspected of having had an accident.

Crosswind Leg: See Traffic Pattern.

Cruise Speed: The air speed, in knots, equivalent to 80 percent of VNE, at 5,000 feet, 80° F (26° C).

CTAF: See Common Traffic Advisory Frequency.

CWN: See Call-When-Needed.

CWN Manager: Individual who manages a CWN aircraft (usually in reference to fire CWN helicopters).

Cyclic Pitch Control: The control which changes the pitch of the rotor blades individually during a cycle of revolution by regulating the tilt of the rotor disc, and therefore, the direction and velocity of horizontal flight. The cyclic is used as the primary control for bank, horizontal movement, and speed. The main rotor system is tilted in the direction of stick movement, causing the helicopter to move in that direction.

-D-

DA: See Density Altitude

DECK: ICS mnemonic for the Deck Coordinator.

Deck: That part of the helibase operational area that includes the touchdown pad, safety circle, hover lanes, and external cargo transport area. It is also usually roped off with flagging.

Deck Coordinator (DECK): The Deck Coordinator is supervised by the Helibase Manager and is responsible for providing coordination at the helibase for personnel and cargo movement. The Deck Coordinator supervises the Parking Tenders and Loadmasters. See Chapter 2.

Delta (Flapping) Hinge: The hinge with its axis parallel to the rotor plane of rotation, which permits the rotor blades to flap to equalize lift between the advancing blade half and retreating blade half of the rotor disc.

Density Altitude (DA): Pressure altitude corrected for temperature and humidity.

Disc Area: The area swept by the blades of the rotor. This is a circle with its center at the rotor hub axis and a radius of one blade length.

Disc Loading: The ratio of the helicopter gross weight to rotor disc area (total helicopter weight divided by the rotor disc area).

Discrete Frequency: A separate radio frequency for use in air traffic control which reduces frequency congestion by controlling the number of aircraft operating on a particular frequency at one time.

Distance Measuring Equipment (DME): Equipment (airborne and ground) used to measure, in nautical miles, the slant range distance of an aircraft from the DME navigational aid (see VORTAC).

Distress: A condition of being threatened by serious and/or imminent danger and requiring immediate assistance.

DM: Departmental Manual (for the United States Department of the Interior)

DME: See Distance Measuring Equipment.

DOI: Department Of the Interior. Officially known as USDI (United States Department of the Interior).

DOT: United States Department Of Transportation.

Downloading: See Weight Reduction.

Downwind Leg: See Traffic Pattern.

Dual-Function Pilot: Any person who acts as Pilot-in-command of an aircraft while on official government business and is not a full-time Pilot (Office of Personnel Management classification 2181), but whose job description <u>does</u> include Pilot duties.

Dual-Rotor Helicopter: Some helicopters have dual main rotors, mounted in tandem, side by side, or one above the other. Torque compensation is usually achieved by turning the rotors in opposite directions.

-E-

EGT: See Exhaust Gas Temperature.

ELT: See Emergency Locator Transmitter

EMT: Emergency Medical Technician.

Emergency: Emergencies can be classified two ways:

1. Life-Threatening Emergency: A situation or occurrence of a serious nature, developing suddenly and unexpectedly and demanding immediate action to prevent loss of life;

2. Operational Emergency: An unforeseen combination of circumstances that calls for immediate action, but is not life-threatening.

Emergency Locator Transmitter: A radio transmitter attached to the aircraft structure which operates from its own power source on 121.5 MHz and 243.0 MHz. It aids in locating downed aircraft by radiating a downward sweeping audio tone, 2-4 times per second. It is designed to function without human action after an accident.

Empty Weight: The weight of the helicopter including the structure, powerplants, all fixed equipment, all fixed ballast, unusable fuel, undrained oil, and total quantity of hydraulic fluid.

EPA: Environmental Protection Agency

Equipped Weight: Empty weight of the helicopter, plus the weight of equipment required for the mission, plus weight of oil. It is a term used by USDA-FS, USDI, and some state and local agencies for load calculation purposes.

Essential Passenger: The assigned Aircraft Flight Manager is responsible for ensuring that only passengers essential to the accomplishment of the mission, including trainees, are on board the aircraft.

Estimated Time Of Arrival (ETA): Term used in flight planning and flight following to estimate the time of arrival at a point.

Estimated Time Of Departure (ETD): Term used in flight planning and flight following to estimate the time of departure from a given point.

Estimated Time Enroute (ETE): Term used in flight planning and flight following to estimate the time enroute from one point to another.

ETA: See Estimated Time of Arrival.

ETD: See Estimated Time of Departure.

ETE: See Estimated Time Enroute.

Excess/Surplus Military Aircraft: Aircraft whose ownership has been transferred to a government agency by the Department of Defense.

Exclusive-Use Contract: See Contract Aircraft.

Exhaust Gas Temperature: An exhaust gas temperature gauge measures, in degrees Celsius or Fahrenheit, the temperature of the exhaust gases at the exhaust manifold.

External Load: A load that is carried outside of the fuselage (normally suspended from a cargo hook).

External Load (Jettisonable). A jettisonable load is usually associated with being an external load that can be released from the cargo hook. Anything attached to the cargo hook on the belly of the helicopter should be capable of being released at any time by the Pilot, or in the event of an emergency (i.e. cargo, slings load lines, lead lines, long line with remote hook). A jettisonable load may be classified as Class B, C, or D in accordance with 14 CFR 133. External Load Classes include:

> **Class A Rotorcraft Load:** The external load cannot move freely, cannot be jettisoned, and does not extend below the landing gear (for example, fixed water tank, cargo rack, etc.).
>
> **Class B Rotorcraft Load:** The external load is jettisonable and is lifted free of land or water during the rotorcraft operation (for example, water bucket, sling load, etc.).
>
> **Class C Rotorcraft Load:** The external load is jettisonable and remains in contact with land or water during the rotorcraft operation (for example, a snow sled).
>
> **Class D Rotorcraft Load:** The external load is other than a Class A, B, or C and has been specifically approved by the FAA for that operation.

-F-

FAA: Federal Aviation Administration.

FAR: See Federal Aviation Regulations, or, depending upon the context, Federal Acquisition Regulations.

FAR/AIM: See Airman's Information Manual.

Federal Aviation Regulations (FAR's): Regulations contained in 14 CFR governing the operation of aircraft in the United States. For public aircraft, FAR Part 47 and Part 91, Subpart B, are the only regulations mandated by the FAA. Agencies gain compliance with other FAR's by incorporating them by reference into manual directives and contracts.

Feet Per Minute (FPM): Feet per minute, usually in reference to ascent or descent.

Final Approach: See Traffic Pattern.

First Aid: Any attention that involves no medical bill. If a physician prescribes medical treatment for less than serious injury and makes a charge for this service, that injury becomes Medical Attention. Also see Serious Injury.

Flapping: The vertical movement of a blade about a delta (flapping) hinge.

Flight Crew Member: An individual holding a valid Federal Aviation Administration (FAA) Airman's Certificate and flight physical as a prerequisite to performance of the duties of the position during flight (for example, Pilot, co-Pilot, flight engineer, flight navigator).

Flight Following: The method(s) and process(es) through which an aircraft is tracked from departure point to destination. Flight following is the knowledge of the aircraft location and condition with a reasonable degree of certainty such that, in the event of mishap, those on board may be rescued. Flight following may be accomplished through filing of flight plans with FAA and/or agency offices, or by an automated satellite reporting system. Though the end result of position check-ins is often the same, flight following should be differentiated from Resource Tracking.

Flight Manager: See Project Flight Manager.

Flight Path: A line, course, or track along which an aircraft is flying or intended to be flown.

Flight Plan: Specified information relating to the intended flight of an aircraft that is filed with FAA or an agency office.

Flight Service Station (FSS): Air traffic facilities which provide Pilot briefing, en route communications, and VFR search and rescue services, assist lost aircraft and aircraft in emergency situations, relay ATC clearances, originate Notices to Airmen, broadcast aviation weather and NAS information, receive and process IFR flight plans, and monitor NAVAID's. In addition, at selected locations, FSS's provide Enroute Flight Advisory Service (Flight Watch), take weather observations, issue airport advisories, and advise Customs and Immigration of transborder flights.

Floats: Landing gear that can be used on land, as well as water. There are two types of floats, fixed and popout. Popouts are inflated only as needed.

Floor Loading: The pounds-per-square-inch (PSI) maximum load limit on the floor of the helicopter.

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.

FPM: See Feet Per Minute.

Freefalling Cargo: See Cargo Freefall.

Freewheeling Unit: A component part of the transmission or power train which automatically disconnects the main rotor from the engine when the engine stops or slows below the equivalent of rotor RPM.

FS-6500-122: USDA-FS Flight Use Report form.

FSS: See Flight Service Station

Fuel Consumption: Fuel consumption, given in pounds per hour, is computed for 5,000 ft. pressure altitude, 80° F (26° C). Fuel weight is computed at 6 pounds per gallon for AVGAS and seven pounds per gallon for jet fuel.

Fuel Capacity: The maximum amount of fuel that can be carried in the helicopter's fuel tanks.

Fusees: Highway flares used as handheld ignition devices.

-G-

General Use: This involves point-to-point transportation of personnel and/or cargo, and all other flights not categorized as special use. See Special Use.

Global Positioning System (GPS): A world-wide navigation system that uses satellite signals to determine position. GPS is replacing LORAN as the preferred system for determining aircraft position.

Government Aircraft: Any aircraft owned, leased, chartered or rented and operated by an Executive Agency.

GPS: See Global Positioning System.

GPU: See Ground Power Unit.

Gross Weight: See Maximum Certificated Gross Weight.

Gross Weight Limit: May be the Maximum Weight Limit for takeoff and landing, a Weight/Altitude/ Temperature (WAT) Limit, or a Maximum gross Weight Limit for External Loads. Limitations may vary for HIGE, HOGE, and HOGE-J.

Ground Effect: When a helicopter is operated near the surface, the downwash velocity created by the rotor blades cannot be fully developed due to the proximity of (interference with) the surface. This restraint of rotor downwash occurs as the helicopter reaches a relatively low altitude - usually one-half a rotor diameter. A “cushion” of air beneath a helicopter hovering or operating near the surface results as air is pushed downward by the main rotor system and semi-compressed against the surface. The net result is a beneficial increase in lift and a lower power requirement to support a given weight. This ground cushion is normally effective, although diminishing, up to a height above the surface equal to the radius of a main rotor blade. Ground effect is adversely affected by uneven terrain below the rotor disc, vegetation (tall grass), etc. See Hover-In-Ground-Effect and Hover-Out-Of-Ground-Effect.

Ground Power Unit: Ground based unit for powering up all aircraft systems.

Ground Speed: The speed of an aircraft relative to the surface of the earth.

Grounded: Refers to an aircraft that is not airworthy, usually due to maintenance problems. May also refer to a Pilot who is not able to perform Pilot duties because of medical reasons.

Gust Spread: The difference between the lowest and highest wind speed.

-H-

Hand Signals: Standard signals authorized for use by ground crews to direct a helicopter during takeoff, landing, or while in a hover. In some cases, helicopter hand signals differ from those prescribed for airplanes.

Hard Point: An approved attachment point designed to carry a load.

Hazard Map: Map of the area of operations that shows all of the known aerial hazards, including but not limited to power lines, military training areas, hang gliding areas, etc.

Hazardous Materials: Hazardous materials are substances that are identified, classified, and regulated in the Code of Federal Regulations, Title 49 and Hazardous Materials Regulations l75. A hazardous material is a substance or material that 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.

HBM-#: HeliBase Management Forms series (see Appendix B).

HCM-#: Helicopter Management Forms series. (See Appendix A.)

Heavy Helicopter: A helicopter with a certified gross weight of over 12,500 pounds. Under the ICS helicopter typing system, a heavy helicopter is a Type 1 helicopter and must have an allowable payload at 59° F. at sea level of 5000 pounds, 16 passenger seats (unless restricted category), and a minimum retardant or water-carrying capability of 700 gallons.

HEB1: ICS mnemonic for Helibase Manager (Type I).

HEB2: ICS mnemonic for Helibase Manager (Type II).

Height-Velocity Diagram: A diagram or chart that indicates the combinations of altitude and airspeed that need to be maintained by a helicopter to ensure a safe autorotation. Each model helicopter has its own height-velocity diagram.

Helibase - Permanent: A designated, permanent facility for helicopter operations. Permanent helibases should have the facilities and equipment outlined in Chapter 8.

Helibase - Temporary: A base for helicopter operations established to serve a temporary or intermittent incident or project need. See Chapter 15 for differentiation between management and operational requirements for helispots and helibases. Temporary helibases should have the facilities and equipment outlined in Chapter 8.

Helibase Manager: The Helibase Manager has primary responsibility for managing all activities at the assigned helibase. Within the ICS system, the Helibase Manager is supervised by the Air Support Group Supervisor. On projects, the Helibase Manager may report to an Air Support Group Supervisor or Air Operations Branch Director if these positions are assigned. Otherwise, the Helibase Manager usually reports to the Project Aviation Manager. There are two types of helibase managers: a Type I Helibase Manager is qualified to manage four or more helicopters; a Type II Helibase Manager may manage three or less helicopters.

Helicopter: Rotorcraft that, for its horizontal motion, depends principally upon its engine-driven rotors.

Helicopter Manager: A person trained in the management of helicopters. See Chapter 2 for training and experience requirements for fire and project helicopter managers. See Project Flight Manager.

Helipad: See Touchdown Pad

Heliport: A permanent facility for the operation of helicopters which has been built to FAA standards and which are marked on aeronautical charts. Natural resource agencies refer to agency heliports as Permanent Helibases. See Helibase - Permanent.

Helispot: A helispot is a natural or improved takeoff and landing area intended for temporary or occasional helicopter use. It may or may not have road access. In many cases, helispots do not meet the requirements of a helibase and thus should not be referred to as helibases. See Chapter 15 for differentiation between management and operational requirements for helispots and helibases. Helispots should have the facilities and equipment outlined in Chapter 8.

Helispot Manager: The Helispot Manager is supervised by the Helibase Manager and is responsible for providing safe and efficient management of all activities at the assigned helispot. See Chapter 2 for training and experience requirements.

Helitack: Helicopter Attack. The utilization of helicopters to transport crews, equipment, and fire retardants or suppressants to the fireline during the initial stages of a fire. The term also refers to the crew that performs helicopter management and attack activities.

Helitank: A tank attached to a helicopter that is filled with water, foam, or retardant and which is configured to drop the liquid in flight. The tank is fixed but removable. See Snorkel Tank.

Helitanker: A helicopter equipped with a helitank or bucket.

Helitorch: The helitorch is a device that dispenses ignited gelled gasoline, which, in turn, ignites fuels for backfires, burnouts, or prescribed burns.

Helitender: See Chase Truck.

Hertz: The standard radio equivalent of frequency in cycles per second of an electromagnetic wave. Kilohertz (Khz) is a frequency of one thousand cycles per second. Megahertz (MHz) is a frequency of one million cycles per second.
HF: See High Frequency

HIGE: See Hover-In-Ground-Effect.

High Frequency (HF): High radio frequencies between 3 and 30 MHz.

HJA-# Helibase Job Aids-Checklists and forms used in helicopter and helibase management.

Hobbs Meter: Flight hour recording device that is activated when power is applied.

HOGE: See Hover-Out-of-Ground-Effect.

Hook Person: Ground person who attaches external loads to cargo hooks on helicopters.

Hot and High: Term commonly used to mean an increase in the International Standard Atmosphere to 95° at 5000 feet MSL. See Standard Day.

Hover: A condition of flight where the helicopter remains fairly stationary over a given point on the ground, moving neither vertically nor horizontally.

Hover Ceiling: The highest altitude at which a helicopter can hover at maximum gross weight. In and out of ground effect hovering ceilings are computed at maximum gross weight in a standard atmosphere and calm air. The value given is density altitude.

Hover Check: Used to describe when a helicopter requires a stabilized hover to conduct a performance/power check prior to hover taxi, air taxi, or takeoff. Altitude of the hover will vary depending upon the purpose of the check.

Hover Hookup: Method of hooking an external load to a cargo-carrying device, usually a cargo hook, beneath a hovering helicopter.

Hover-In-Ground-Effect (HIGE): Operating at such an altitude (usually one-half the rotor diameter above the surface or lower) that the influence of ground effect is realized. When considering aircraft payload, the applicable aircraft performance chart must be referenced to determine hover height (typically skid height less than 5 feet). Additionally, the aircraft must be operated over a smooth, level, flat surface, in no wind or favorable wind conditions. See Chapter 7. See Ground Effect.

Hover-Out-of-Ground-Effect (HOGE): Hovering without the benefit of the ground effect cushion. For any given altitude, hovering out of ground effect takes more power than hovering in ground effect. See Chapter 7. See Ground Effect.

Hover Taxi: Used to describe a helicopter movement conducted above the surface and in ground effect at airspeeds less than approximately 20 knots. The actual height may vary, and some helicopters may require hover taxi above 25 feet AGL to reduce ground effect turbulence or provide clearance for cargo sling loads.

Hunting: See Blade Hunting.

HZ: See Hertz

-I-

IAS: Indicated AirSpeed. See Airspeed.

IFR: See Instrument Flight Rules

IGE: See Hover-In-Ground-Effect.

IMC: See Instrument Meteorological Conditions

In The Blind: See Blind Transmission.

Incidental Pilot: Any person who acts as Pilot-in-command of an aircraft while on official government business whose job description does not include Pilot duties. An example would be Piloting of private or government aircraft for official government business in lieu of operation of private or government-owned/leased automobile.

Indicated Air Speed (IAS): See Airspeed.

Indicated Altitude: See Altitude.

In-Ground Effect (IGE): See Hover-In-Ground-Effect.

Instrument Flight Rules (IFR): Rules governing the procedures for conducting instrument flight. Also, a term used by Pilots and controllers to indicate type of flight plan. See Visual Flight Rules and Instrument Meteorological Conditions.

Instrument Meteorological Conditions: Meteorological conditions which can be expressed in terms of visibility, distance from cloud, and ceiling less than specified minima for visual meteorological conditions.

Interagency Qualifications and Certification System (IQCS): The IQCS system is an information management system that tracks training and certifications for wildland firefighters.

Internal Load: A load that is carried inside the fuselage structure.

Internal Load (Non-Jettisonable): An internal, non-jettisonable load is generally associated with cargo being transported inside the helicopter. Freight secured in cargo compartments is a non-jettisonable internal load. Cargo secured in a basket on the side of the helicopter is also defined as non-jettisonable, although it also technically classified as a Class A external loads under 14 CFR 133.

IR: InfraRed

IR Route: Military Training Route conducted under IFR. See Interagency Airspace Coordination Guide.

ISA: International Standard Atmosphere. See Standard Day.

ITT: Inter-Turbine Temperature.

-J-

Jet-A: Most commonly used fuel used in natural resource agency turbine helicopter operations. See Chapter 13.

Jettisonable Load: One that can be jettisoned by the Pilot from his or her normal flight position. See Non-Jettisonable Load.

-K-

KIAS: Knots Indicated AirSpeed. See Airspeed.

Knot: A measurement of speed equal to nautical miles per hour (1.151 x knots = MPH.)

-L-

L.A. Tank: Helicopter fixed tank developed by Los Angeles County.

Landing And Takeoff Area: The landing and takeoff area contains touchdown pads and safety circles and includes that part of the helibase complex where flight operations are concentrated.

Large Helicopter: See Heavy Helicopter.

Leadline: A line or set of lines used in external load operations. See Chapters 9 and 11.

LEO: Law Enforcement Officer

LF: See Low Frequency.

Life-Threatening Emergency: See Emergency.

Light Helicopter: A helicopter with certified gross weight of less than 6,000 pounds. Under the ICS helicopter typing system, a light helicopter is a Type 3 helicopter and must have an allowable payload at 59° F. at sea level of 1000 pounds, 2-5 passenger seats, and a retardant or water-carrying capability of 100 gallons.

Limited Use Helicopter: Limited Use Helicopter is an interagency term used to denote a Restricted category helicopter or a Standard category helicopter that is designated and utilized in a limited role (not for passenger transport). Use would typically be external cargo transport, water bucket or retardant missions. See IHOG Chapter 2, Chart 2-4 for staffing requirements. See the National Type I & II CWN Helicopter Contract, Section C for further information and requirements.

Line Manager (Line Officer, Agency Administrator): Agency individual with authority and responsibility for an agency unit; has line item signature authority for policy decisions. Examples: District Ranger, Park Superintendant, Refuge Manager, Field Manager, etc.

Load Calculation: Written documentation of a helicopter's lifting capability for a given altitude and temperature. See Chapter 7.

Loadmaster: The Loadmaster is supervised by the Deck Coordinator and is responsible for the safe loading and unloading of personnel and/or cargo. See Chapter 2.

Longline: A line or set of lines, usually in 50' increments, used in external load operations that allow the helicopter to place loads in areas in which the helicopter could not safely land. See Chapters 9 and 11.

Loran: An electronic navigation and position-determining system by which hyperbolic lines of position are determined by measuring the difference in time of reception of synchronized pulse signals from two fixed transmitters. The Global Positioning System (GPS) is replacing Loran as the system of choice for aircraft position determination.

Low Frequency (LF): The frequency band between 30 and 300 Khz.

-M-

Main Rotor: The rotor or rotors that supply the lifting force for the helicopter.

Maintenance Deficiency: A defect or failure causing mechanical difficulties encountered in flight operations. Not specifically identified as an incident or aviation hazard.

Management Information System (MIS): Information system operated by USDI that collects and collates aviation use and cost statistics from flight payment documents.

Manifest: A written list of personnel and/or cargo and their weights to be transported. See Chapter 10.

Maximum Computed Gross Weight: The gross weight, obtained from the appropriate performance chart, which is the maximum weight appropriate to the applicable circumstances of configuration and/or environmental conditions. See Maximum Certificated Gross Weight. See Chapter 7.

Maximum Certificated Gross Weight: Maximum certificated gross weight is the absolute maximum allowable weight (crew, passengers, fuel, oil, fluids, cargo, and special equipment) as established by the manufacturer and approved by the Federal Aviation Administration. Some helicopter models have higher gross weights for jettisonable external loads. If no number appears in the external weight block, the weight is the same as internal. See Maximum Computed Gross Weight. See Chapter 7.

Mayday Call: The international distress signal indicating that the Pilot of an aircraft is experiencing an in-flight emergency. When repeated three times, it indicates imminent and grave danger and that immediate assistance is requested. Dispatch or other flight following personnel must listen closely since the Pilot or other air crew will be relaying location information essential to the dispatch of rescue services.

Mean Sea Level (MSL): Commonly used in conjunction with a number of feet and, thereby indicating altitude above mean sea level, such as 10,000 feet MSL.

Medical Attention: An injury, less than serious, for which a physician prescribes medical treatment and charges for the medical service. Also see First Aid and Serious Injury.

Medium Helicopter: A helicopter with a certified gross weight between 6,000 and 12,500 pounds. Under the ICS helicopter typing system, a medium helicopter is a Type 2 helicopter and must have an allowable payload at 59° F. at sea level of 2500 pounds, 6-10 passenger seats (unless restricted category), and a minimum retardant or water-carrying capability of 300 gallons.

Memorandum Of Understanding: A written agreement between two or more parties.

MHEC: Military Helicopter Crew Member. See Military Operations Guide.

Military Aircraft: An aircraft maintained and operated by an active or reserve component (all Reserve forces, as well as Army and Air National Guard) of the DOD, or by any active or reserve component of the U.S. Coast Guard (USCG). All references to “military aircraft” include both DOD and USCG aircraft.

Minimums: Weather condition requirements established for a particular operation (for example, landing minimums, takeoff minimums, VFR flight minimums).

MIS: See Management Information System.

Missing Aircraft: A missing aircraft is one that has not made a check-in and which has exceeded the fuel endurance specified on the flight plan or which was relayed to the flight following facility upon departure.

Mission Flight: These flights are defined by exclusion as all flights not meeting the definition of “point-to-point” flight. As such, mission flight requires work to be performed in the air (for example, retardant or water delivery, reconnaissance, etc.), or through a combination of ground and aerial work (for example, delivery of personnel and/or cargo from helibases to helispots or unimproved landing sites, rappelling or cargo letdown, horse herding, etc.).

MOA: Military Operations Area. See Interagency Airspace Coordination Guide.

Monitor: When used in communications, to listen on a specific frequency and stand by for instructions or communications. Under normal circumstances, a frequency that is being monitored is not being used by the Pilot for communications.

Motorcycle-type Throttle: A handgrip throttle is mounted on the collective pitch stick for coordinated use on piston-engine-powered helicopters. As the pitch is increased, power must be added to maintain rotor revolutions per minute (RPM) when the helicopter lifts off or climbs. On turbine-engine-powered helicopters, this power coordination is accomplished automatically through the fuel control and governor systems of the turbine engine.

MOU: See Memorandum Of Understanding. A written agreement between two or more parties.

MTR: Military Training Route. See Interagency Airspace Coordination Guide.

-N-

NAS: See National Airspace System

National Airspace System (NAS): The common network of U.S. airspace; air navigation facilities, equipment, and services, airports, and landing areas; aeronautical charts, information, and services; rules, regulations and procedures, technical information, and personnel and material. Included are system components jointly shared with the military.

National Transportation Safety Board (NTSB): The NTSB is charged with the responsibility to investigate all civil transportation mishaps including air, ground, water rail, and pipeline and those public transportation mishaps which have high public interest.

NAVAID: See Navigational AID.

Navigational Aid (NAVAID): Any visual or electronic device airborne or on the surface which provides point-to-point guidance information or position data to aircraft in flight.

NDB: See NonDirectional Beacon.

Negative: “No,” or “permission not granted,” or “that is not correct.”

NFDC: National Flight Data Center. See Interagency Airspace Coordination Guide.

NFES: National Fire Equipment Supply.

NIFC: National Interagency Fire Center.

Night: The time between the end of evening civil twilight and the beginning of morning civil twilight, as published in the American Air Almanac, converted to local time. Civil twilight ends in the evening when the center of the sun’s disk is 6° below the horizon and begins in the morning when the center of the sun's disk is 6° below the horizon.

Nomex: Fire resistant synthetic material used in the manufacturing of flight suits and pants and shirts used by firefighters.

Nondirectional Beacon (NDB): A L/MF or UHF radio beacon transmitting nondirectional signals whereby the Pilot of an aircraft equipped with direction finding equipment can determine his/her bearing to or from the radio beacon and “home” on or track to or from the NDB station. See Automatic Direction Finder (ADF).

Non-Serious Aircraft Incident: An incident that does not meet Serious Aircraft Incident criteria. See Serious Aircraft Incident.

NOTAM: See Notice To Airmen.

Notice To Airmen (NOTAM): A notice containing information (not known sufficiently in advance to publicize by other means) concerning the establishment, condition, or change in any component (facility, service, or procedure of, or hazard in the National Airspace System) the timely knowledge of which is essential to personnel concerned with flight operations.

1. NOTAM (D): A NOTAM given (in addition to local dissemination) distant dissemination beyond the area of responsibility of the Flight Service Station. These NOTAM's will be stored and available until cancelled.

2. NOTAM (L): A NOTAM given local dissemination by voice and other means, such as teleautograph and telephone, to satisfy local user requirements.

3. FDC NOTAM: A NOTAM regulatory in nature, transmitted by USNOF and given system wide dissemination.

NTSB: See National Transportation Safety Board

NVG: Night Vision Goggles

-O-

Official Passenger: The following categories of personnel are official passengers:

- Officers and employees of the Federal Government traveling on official business.

- Members of Congress and employees of Congressional committee staffs whose work relates to the agency's programs.

- Non-Federal passengers when engaged in missions which enhance accomplishment of an agency program such as personnel of cooperating state, county, or local agencies; representatives of foreign governments; and contractors' representatives.

On-Call Contract: See Contract Aircraft.

Operating Weight: The equipped weight plus the weight of the crew and fuel.

OSHA: Occupational Safety and Health Administration.

One-Skid Landing: The maneuver of placing one skid of the helicopter on the ground, while the other is still above the ground. Caused by steep changes in terrain, power is still maintained to the rotor system. Requires agency authorization and training.

Operational Procedures Memorandum (OPM): Temporary or interim directives are issued by AMD as OPM's to permit the timely dissemination of instructional and procedural material. They are published under the issuing authority of the AMD Director. They are consecutively numbered within each calendar year.

Operational Emergency: See Emergency.

OPM: See Operational Procedures Memorandum.

Out-Of-Ground-Effect (OGE): See Hover-Out-Of-Ground-Effect (HOGE).

Overdue Aircraft: An overdue aircraft is one that fails to meet a check-in specified on the flight plan.

-P-

Parking Tender: The Parking Tender is supervised by the Deck Coordinator and is responsible for ground and air traffic in and around the assigned landing pad and for the landing and parking of helicopters at that pad. See chapter 2.

Passenger: Any person aboard an aircraft who does not perform the function of a flight crew member or air crew member. See Air Crew Member and Flight Crew Member.

Payload: Payload is established by subtracting the equipped weight of the helicopter, including two hours of fuel and Pilot from the computed gross weight for a calm day, 5,000-foot pressure altitude, 80° F. (26° C., 7,400 feet density altitude), two hours fuel, and a Pilot. Downloading is not included in this computation.

Performance Chart: A chart, table, or graph provided by the helicopter manufacturer for use in determining an aspect of helicopter performance.

Personal Flotation Device (PFD): A twin-cell, self-righting, life preservers providing a minimum of 35-pound buoyancy; with two CO2 charging cartridges and provision for back-up inflation by mouth; meeting the standards of TSO-C13. See Chapter 9.

Personal Protective Equipment (PPE): Includes clothing and equipment that provides protection to an individual on board an aircraft or who is engaged in ground-based aviation support activities. See Chapter 9.

PI: See Project Inspector.

Ping-Pong Ball Machine: See Plastic Sphere Dispenser (PSD).

PIC: See Pilot-In-Command.

Pilot-in-Command (PIC): The Pilot responsible for the operation and safety of an aircraft during flight time. The PIC has final authority over any flight mission.

Pilot Qualifications Card: Documentation carried by the Pilot listing the type of helicopters for which the Pilot is approved, as well as the different types of missions that he/she is approved to fly.

Pitch Angle: The angle between the chord line of the rotor blade and the reference plane of the main rotor hub or the rotor plane of direction.

Plastic Sphere Dispenser (PSD): The Plastic Sphere Dispenser is a device that dispenses a sphere of polystyrene containing potassium permanganate, after injecting each sphere with ethylene glycol. The exothermic reaction of the two chemicals creates enough heat to ignite the plastic sphere.

Point-To-Point Flight: Typically, the flight originates at one developed airport or permanent helibase, with flight route being direct to another developed airport or permanent helibase. The flight is conducted solely for the purpose of transportation of persons or cargo for administrative travel purposes, and does not involve mission-type flight. See Mission Flight.

Portatank: Container, either with rigid frame or self-supporting, which can be filled with water or retardant and from which helicopters can fill buckets or tanks. Helicopters are also used to transport water to the portatank for ground personnel to use.

PPE: See Personal Protective Equipment.

Precautionary Landing: A landing necessitated by apparent impending failure of engines, systems, or components which makes continued flight unadvisable.

Private Aircraft: Any aircraft owned by an individual, partnership, or club.

Procurement Document: Contract or rental agreement.

Project: A non-incident mission or task which utilizes aviation assets. Used in this guide to differentiate from fire or other all-risk incident uses.

Project Flight Manager: The government representative responsible for coordinating with the Pilot concerning mission planning, needs and conduct. This individual fulfills managerial duties during non-complex helicopter flight missions. See Chapter 2.

Project Inspector (PI): The Project Inspector (PI) is designated by the to assist in implementing the COR's instructions, as required. Responsibilities of the PI may include verifying services performed by the vendor; ensuring vendor's compliance with contract specifications and provisions; discussing daily work requirements and ordering service within the contract provisions; discussing problems which occur with the vendor and recommending solutions to the COR; and completing Form HCM-1, Aircraft Contract Daily Diary (see Appendix A). Any problems of a serious nature are brought immediately to the attention of the COR and CO. See Contracting Officer, Contracting Officer's Administrative Representative, and Contracting Officer's Technical Representative.

PSD: See Plastic Sphere Dispenser (PSD).

Public Aircraft: An aircraft used exclusively in the service of any Government or of any political subdivision thereof, including the Government of any state, territory, or possession of the United States, or the District of Columbia, but not including any Government-owned aircraft engaged in carrying persons or property for commercial purposes. "Used exclusively in the service of" means for, other than the Federal Government, an aircraft which is owned and operated by a Governmental entity for not less than 90 continuous days.

-R-

RA: Restricted Area. See Interagency Airspace Coordination Guide.

Radio Altimeter: Aircraft equipment which makes use of the reflection of radio waves from the ground to determine the height of the aircraft above the surface.

Rappeller: Individual who uses the helicopter as a platform to perform rapelling operations for all types of missions to include fire, search and rescue, law enforcement etc.

Rescue And Firefighting (RFF): Crash-rescue term to describe those personnel who have been trained to respond to aircraft accidents, possibly involving an aircraft fire.

Restricted Category: Restricted category aircraft are aircraft that do not qualify for certification in any other category because of design, intended use, or flight tests have not been conducted to qualify for other categories of operation. This type aircraft is generally used for cargo, retardant dropping, agricultural operations, survey work and other specific projects.

RFF: See Rescue and Firefighting.

Rigid Rotor: A rotor system with blades fixed to the hub in such a way that they can feather but cannot flap or drag. See Semirigid Rotor and Articulated Rotor.

Roger: “I have received all of your last transmission.” It should not be used to answer a question requiring a yes or no answer. See Affirmative and Negative.

Rotor: An assembly of airfoils (rotorblades) together with a hub and attachments, that rotates about an axis to provide lift and/or thrust for a helicopter.

Remote Hook: Cargo hook that is attached to the end of a long line that has both electrical and manual releases. See Chapters 9 and 11.

Resource Tracking: In order to facilitate cost-effective use of aircraft and planning of resources, scheduling offices and ordering offices may request Pilots or the government representative on board an aircraft (that is, the Helicopter or Flight Manager) to relay flight status information at designated intervals.

Rotor Disc: See Disc Area.

-S-

Safety Circle: A safety zone that provides an obstruction-free area on all sides of the touchdown pad. For helispots and helibases, the only items that should be within the safety circle are a fire extinguisher, a pad marker, and, if applicable, external or internal loads awaiting transport. The Parking Tender may also be within the safety circle. The size of the safety circle depends on the size of the helicopter (see Chapter 8).

SAR: Search And Rescue

Seating: The number of seats in the helicopter, including Pilot's seat.

Sectional, Aeronautical: 1:500,000 scale chart designed for visual navigation of slow or medium speed aircraft. Topographic information on these charts features surface elevation. Aeronautical information includes visual and radio aids, airports, controlled airspace, special-use airspace, centerlines of military training routes, obstructions, and related data.

See And Avoid: A visual procedure wherein Pilots of aircraft flying in visual meteorological conditions (VMC), regardless of the type of flight plan, are charged with the responsibility to observe the presence of other aircraft and to maneuver their aircraft as required to avoid the other aircraft. Right-of-way rules are contained in FAR Part 91. See Instrument Flight Rules; Instrument Meteorological Conditions; Visual Flight Rules; and Visual Meteorological Conditions.

Semirigid Rotor: A rotor system in which the blades are fixed to the hub but are free to flap and feather. See Articulated Rotor and Rigid Rotor.

Senior Executive Branch Officials: Civilian officials appointed by the President with the advice and consent of the Senate, or civilian employees of the Executive Office of the President.

Senior Federal Officials: Federal employees paid at a rate of pay beyond a GS/GM-15.

Separation: In air traffic control, the spacing of aircraft to achieve their safe and orderly movement in flight and while landing and taking off.

Serious Aircraft Incident: An incident or malfunction that could adversely affect the safety of a flight. An unplanned event that results in significant damage to the aircraft, which is less than substantial, rendering the aircraft unairworthy, and/or caused injury requiring medical attention. See Non-serious Aircraft Incident.

Serious Injury: (Also see First Aid.) An injury incurred that, when determined by a physician, causes death or:

- Requires hospitalization for more than 48 hours, commencing within seven days from the date the injury was received; or

- Results in a fracture of any bone (except simple fractures of fingers, toes or nose); or,

- Involves lacerations causing severe hemorrhages, nerve, muscle or tendon damage; or,

- Involves injury to any internal organ; or involves second or third-degree burns, or any burns affecting more than 5% of the body surface.

Service Ceiling: Altitude at which the aircraft can no longer climb at a minimum rate of 100 feet per minute.

Shorthaul: To transport one or more persons externally suspended below a helicopter. The use of a helicopter and an externally attached line (length varies) for the purpose of inserting and/or extracting personnel to areas that are inaccessible to a normal landing. Used primarily for search and rescue operations or life threatening emergencies.

SIC: Second-In-Command (Co-Pilot of the aircraft)

Single-Rotor Helicopter: The most common design of helicopter uses a single main rotor, which imparts lift and thrust. Except for newer helicopters with no tail rotor, torque is countered by a smaller tail rotor.

Skids: Most common type of landing gear used in light- and medium-class helicopters.

Sling Load: An external load supported by a sling, net, bag, line, or combination of these.

Slip: The controlled flight of a helicopter in a direction not in line with its fore and aft axis.

Small Helicopter: See Light Helicopter.

Snorkel Tank: A fixed tank attached to the belly of the helicopter that has a pump-driven snorkel attached. The helicopter hovers over the water source with the end of the snorkel immersed. The pump then fills the tank.

SOP: Standard Operating Procedures.

Special Use: Operations which require special considerations due to the functional use of the aircraft. This may require deviation from normal operating practices where authorized by the agency. Special Pilot qualifications and techniques, special aircraft equipment, and personal protective equipment are required to enhance the safe transportation of personnel and property. See General Use.

Squawk: Activate specific modes/codes/functions on the aircraft transponder, for example, “Squawk three/alpha, two one zero five, low.”

SR: Slow Route flown by military aircraft. See Interagency Airspace Coordination Guide.

Stall: See Blade Stall.

Stand By: Means the controller or Pilot must pause for a few seconds, usually to attend to other duties of a higher priority or to determine information requested. If a delay is lengthy, the caller should reestablish contact.

Standard Day: Properly known as International Standard Atmosphere (ISA). Atmospheric conditions in which (1) the air is a dry, perfect gas; (2) the temperature at sea level is 59° F. (15° C.); (3) the pressure at sea level (or reduced to sea level) is 29.92 inches of Hg; and (4) the temperature gradient is approximately 3½° F. per 1,000-foot change in altitude.

Standard Use Helicopter: Helicopter authorized to perform passenger transportation, external and internal cargo missions.

STC: A Supplemental Type Certificate (STC) is a document issued by the FAA, approving a product (aircraft engine or propeller) modification. The STC defines the product design change; states how the modification affects the existing type design, and lists serial number affectivity.

Step-Out Landing: Passengers/ air crew members exit the helicopter while it is at a low hover, stepping off the skid or float. Requires agency authorization and training.

SUA: Special Use Airspace. See Interagency Airspace Coordination Guide.

Substantial Damage: Any damage or structural failure which adversely affects the structural strength, performance, or flight characteristics of the aircraft, or which would normally require major repair or replacement of the affected components.

Sunset And Sunrise: The mean solar times of sunset and sunrise as published in the Nautical Almanac, converted to local standard time for the locality concerned. Within Alaska, the end of evening civil twilight and the beginning of morning civil twilight, as defined for each locality. See Night.

Supplemental Type Certificate (STC): A document issued by the Federal Aviation Administration approving a product (aircraft, engine, or propeller) modification. The STC defines the product design change, states how the modification affects the existing type design, and lists serial number affectivity.

Swivel: Helicopter accessary used with external jettisonable loads that hooks into the cargo hook or the remote hook. The swivel allows the load to oscillate in flight with binding the lines. See Chapters 9 and 11.

-T-

TACAN: See TACtical Air Navigation

Tactical Air Navigation (TACAN): An ultra-high frequency electronic air navigation aid which provides suitably equipped aircraft a continuous indication of bearing and distance to the TACAN station. See VORTAC.

Tail Rotor: The force that compensates for torque and keeps the fuselage from turning in the direction opposite to the main rotor is produced by means of an auxiliary rotor called a tail or antitorque rotor located on conventional helicopters at the end of the tail boom. The tail rotor produces thrust in the direction opposite to torque reaction produced by the main rotor. Foot pedals in the cockpit permit the Pilot to increase or decrease tail-rotor thrust, as needed, to neutralize torque effect. Operation of the pedals also provides a measure of directional control. See Torque.

Takeoff and Landing Coordinator (TOLC): The Takeoff and Landing Coordinator is supervised by the Helibase Manager and is responsible for providing coordination of arriving and departing helicopters and movement around the helibase. When this position is not filled, the Deck Coordinator or Aircraft Base Radio Operator will usually assume this function. See Chapter 2.

Taxi: The surface movement of helicopters equipped with wheels. See Hover Taxi.

TBO: See Time Before Overhaul.

Technical Standard Order: A Technical Standard Order (TSO) is a minimum performance standard issued by the FAA for specified materials, parts, processes, and appliances used on civil aircraft.

Time Before Overhaul: Specified period of time for aircraft components at the end of which they must be overhauled or replaced.

Tip-Path Plane: The plane in which rotor blade tips travel when rotating.

Tip Speed: The rotative speed of the rotor at its blade tips.

TIT: Turbine Inlet Temperature.

Toe-In Landing: The front part of the skids (toes) are placed on some type of ground surface to stabilize the helicopter. Requires agency authorization and training.

TOLC: ICS mnemonic for the Takeoff and Landing Coordinator.

Torque: A force or combination of forces that tends to produce a countering rotating motion. Looking down on the helicopter, in a single rotor helicopter where the main rotor turns counterclockwise, the fuselage tends to rotate clockwise. Use of anti-torque controls affect the tail rotor, which counters the effects of torque produced by the main rotor. Pedal movement induces pitch changes to the tail rotor blades, thereby accomplishing heading and directional control in a hover. With forward movement, the Pilot must blend pedal action with other control movements to produce coordinated flight. On dual-rotor helicopters, the problem of torque control is solved through the counterrotation of the main rotor system.

TOT: Turbine Outlet Temperature.

Touchdown Pad: A designated area, usually with a prepared or improved surface, on a heliport, airport, takeoff/landing area, apron/ramp, or movement area used for takeoff, landing, or parking of helicopters. See Chapter 8.

Traffic Pattern: The traffic flow that is prescribed for landing at, taxiing on, or taking off from an airport. The components of a typical traffic pattern are upwind leg, crosswind leg, downwind leg, base leg, and final approach.

1. Upwind Leg: A flight path parallel to the landing area in the direction of landing.

2. Crosswind Leg: A flight path at right angles to the landing area in the direction opposite to landing.

3. Downwind Leg: A flight path parallel to the landing area in the direction opposite to landing. The downwind leg normally extends between the crosswind leg and the base leg.

4. Base Leg: A flight path at right angles to the landing area off its approach end. The base leg normally extends from the downwind leg to the intersection of the extended approach path centerline.

5. Final Approach: A flight path in the direction of landing along the extended approach path centerline. The final approach extends from the base leg to the extended approach path centerline. An aircraft making a straight-in approach VFR is also considered to be on final approach.

Translational Lift: The additional lift obtained through airspeed because of increased efficiency of the rotor system, whether it be when transitioning from a hover into horizontal flight or when hovering into a wind. The rotor system produces more lift in forward flight because the higher inflow velocity supplies the rotor disc with a greater mass of air per unit time upon which to work than it receives while hovering. Translational lift is present with any horizontal movement, although the increase will not be noticeable until airspeed reaches approximately 15-20 knots.

Transmitting In The Blind: See Blind Transmission.

Transponder: The airborne radar beacon receiver/transmitter portion of the Air Traffic Control Radar Beacon System which automatically receives radio signals from interrogators on the ground, and selectively replies with a specific reply pulse or pulse group only to those interrogations being received on the mode to which it is set to respond.

True Airspeed: See Airspeed.

TSO: A Technical Standard Order (TSO) is a minimum performance standard issued by the FAA for specified materials, parts, processes, and appliances used on civil civil aircraft.

Types of Helicopters: The FAA typing of helicopters (heavy, medium, light) denotes maximum takeoff/landing weight. ICS typing (1-3) denotes minimum number of seats, payload, and water/ retardant carrying capability. See Chapter 6.

-U-

U61/U Jacks: Interagency standard connector plug for flight helmets.

UHF: See UltraHigh Frequency

Ultrahigh Frequency (UHF): The frequency band between 300 and 3,000 MHz.

Unauthorized Passenger: All personnel who are not official or unofficial passengers are considered unauthorized personnel and are not authorized to be transported in any aircraft owned or operated on behalf of the agency.

Uncontrolled Airspace: Uncontrolled airspace is that portion of the airspace that has not been designated as continental control area, control area, control zone, terminal control area, or transition area and within which ATC has neither the authority nor the responsibility for exercising control over air traffic. See Controlled Airspace.

UNICOM: A nongovernment communication facility which may provide airport information at certain airports. Locations and frequencies of UNICOM's are shown on aeronautical charts and publications and in the Airport/Facility Directory.

Upwind Leg: See Traffic Pattern.

USDA: United States Department of Agriculture

USDI: United States Department of the Interior

Unimproved Landing Site or Area: A landing spot used for the first time at the discretion of the Pilot and to which no improvements (for example, pad leveling, obstruction removal, placement of wind indicator) have been made. If it is to be used on a recurring basis, approval is necessary and improvements should be made. See Chapter 8.

Useful Load: This number, in pounds, is established by subtracting the average equipped weight of the helicopter from gross weight.

-V-

Vendor: Operator of aircraft who provides aircraft services through a procurement document.

Vertical Separation: Separation established by assignment of different altitudes or flight levels. See Separation.

Very High Frequency (VHF): The frequency band between 30 and 300 MHz. Portions of this band, 108 to 118 MHz, are used for certain NAVAID's. 118 to 136 MHz are used for civil air/ground voice communications, with certain pre-authorized frequencies for air-to-air communications.

Very High Frequency Omnidirectional Range (VOR) Station: A ground-based electronic navigation aid transmitting very high frequency (VHF) navigation signals, 360 degrees in azimuth, oriented from magnetic north. VOR has been used as the basis for navigation in the national airspace system (navigation by Global Positioning System (GPS) is a new alternative). The VOR periodically identifies itself by Morse code and may have an additional voice identification feature. Voice features may be used by Air Traffic Control or Flight Service Stations for transmitting instructions/information to Pilots.

Very High Frequency Omnidirectional Range/Tactical Air Navigation (VORTAC): A navigation aid providing VOR azimuth, and TACAN distance measuring equipment (DME) at one site.

VFR: See Visual Flight Rules.

VHF: See Very High Frequency.

Visibility: The ability as determined by atmospheric conditions and expressed in units of distance, to see and identify prominent unlighted objects by day and prominent lighted objects by night. Visibility is reported as statute miles, hundreds of feet, or meters. Refer to FAR 91.

Visual Flight Rules: Rules that govern the procedures for conducting flight under visual conditions. The term “VFR” is also used in the United States to indicate weather conditions that are equal to or greater than minimum VFR requirements. In addition, it is used by Pilots and controllers to indicate type of flight plan.

Visual Meteorological Conditions: Meteorological conditions which can be expressed in terms of visibility, distance from cloud, and ceiling equal to or better than specified minima.

VMC: See Visual Meteorological Conditions

VNE: Velocity Never to Exceed

VOR: See Very High Frequency Omnidirectional Range Station.

VORTAC: Very High Frequency Omnidirectional Range/TACtical Air Navigation. See TACAN.

VR Route: Military Training Route conducted under VFR. See Interagency Airspace Coordination Guide.

-W-

Weight Reduction: A fixed weight, differing for each make and model of helicopter, that provides a margin of safety.

Wheels: Primarily used on airplanes and medium and heavy helicopters.

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