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 inter-agency 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.
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.


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 both 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

<table>
<thead>
<tr>
<th>TYPE HELICOPTER</th>
<th>Federal Aviation Administration (FAA) STANDARD / TRANSPORT CATEGORY</th>
<th>FAA Standard Category Temporarily Designated for Limited Use</th>
<th>FAA Standard Category Permanently Designated for Limited Use or FAA Restricted Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Manager plus Four (4) Helicopter Crewmembers (HECM)</td>
<td>Manager only</td>
<td>Manager only</td>
</tr>
<tr>
<td>2</td>
<td>Manager plus Three (3) HECMs</td>
<td>Manager only</td>
<td>Manager only</td>
</tr>
<tr>
<td>3</td>
<td>Manager plus Two (2) HECMs</td>
<td>Manager only</td>
<td>Manager only</td>
</tr>
</tbody>
</table>

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 are not 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 both incident and resource operations.

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 primary management tools of the Helibase Manager. 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.


B. Helisport Manager.

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

Since helispots are physically separate from the helibase, resulting in the inability of the Helibase Manager to oversee and monitor helisport 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 helisport manager duties and responsibilities, as well as the load capability planning forms in Appendices A and B.

Management of the helisport 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 helisport management, providing on-the-job training as necessary; conduct regular briefings with helisport crew; ensure all assigned personnel understand their responsibilities and authority; manage resources/supplies dispatched to helisport.

3. Obtain necessary equipment and supplies for the operation of the helisport (tools, fire extinguishers, wind indicators, etc.).

4. On incidents, ensure that all helisport personnel are capable of and prepared to perform fire suppression duties in and around the helisport; ensure that helisport crew is equipped to remain overnight, even in adverse weather conditions.

5. Obtain allowable payload information for the helisport 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 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) 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. 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.


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 not 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) assigned; 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.


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, and 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.

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.

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

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

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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.

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 cooperators, 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)
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.
- 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.
- 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

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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.

   a. 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,
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
### Exhibit 3-2: Hazard Analysis and Dispatch/Aviation Manager Checklist

<table>
<thead>
<tr>
<th>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:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Towers and bridges</td>
</tr>
<tr>
<td>Other aerial obstructions:</td>
</tr>
<tr>
<td>Military Training Routes (MTRs) or Special-Use Airspace (MOAs, Restricted Areas, etc.)</td>
</tr>
<tr>
<td>Areas of high-density air traffic (airports):</td>
</tr>
<tr>
<td>Commercial or other aircraft</td>
</tr>
<tr>
<td>Wires/transmission lines: wires along rivers or streams or across canyons</td>
</tr>
<tr>
<td>Weather factors: wind, thunderstorms, etc.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>II. DISPATCHER/AVIATION MANAGEMENT CHECKLIST</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pilot and aircraft certifying check list and vendor, certifying meets requirements;</td>
</tr>
<tr>
<td>OR, Necessary approvals have been obtained for use of uncharted cooperatives, military or other government agency aircraft and pilots</td>
</tr>
<tr>
<td>Check with vendor that an aircraft with sufficient capability to perform mission safety has been scheduled</td>
</tr>
<tr>
<td>Qualified Aircraft Chief-of-Party has been assigned to the flight (noted on reverse)</td>
</tr>
<tr>
<td>All DOI passengers have received required aircraft safety training</td>
</tr>
<tr>
<td>OR, Aviation manager will present detailed safety briefing prior to departure;</td>
</tr>
<tr>
<td>Bureau Aircraft Chief-of-Party will be furnished with a Chief-of-Party/Pilot checklist and is aware of its use</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>III. APPROVALS</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. MISSION FLIGHT: HAZARD ANALYSIS PERFORMED BY:</td>
</tr>
<tr>
<td>Reference Handbook §420 for approval/required Signature:</td>
</tr>
<tr>
<td>B. MISSION FLIGHT: HAZARD ANALYSIS REVIEWED BY:</td>
</tr>
<tr>
<td>C. IF NON-FIRE, ONE-TIME (NON-RECURRING), SPECIAL-USE MISSION, SIGNATURE OF LINE MANAGER IS REQUIRED:</td>
</tr>
<tr>
<td>D. THIS FLIGHT IS APPROVED BY (Authorized Signature):</td>
</tr>
</tbody>
</table>

Note: 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
- Conflicting Priorities
- Personnel
- Turbulence
- Weather
- 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?
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

<table>
<thead>
<tr>
<th>Point-to-Point</th>
<th>Flight Following</th>
<th>Resource Tracking</th>
</tr>
</thead>
<tbody>
<tr>
<td>OPTIONS</td>
<td></td>
<td>Resource Tracking may be performed by PHONE or RADIO (if aircraft is equipped with VHF-FM)</td>
</tr>
<tr>
<td>1. FAA IFR Flight Plan</td>
<td></td>
<td>Check-ins are made</td>
</tr>
<tr>
<td>2. FAA VFR With Check-in Every ____ Minutes To FAA</td>
<td></td>
<td>1. With Scheduling Dispatcher @ ____________________________</td>
</tr>
<tr>
<td>3. Agency VFR With Check-in via radio Every ____ Minutes To Agency Dispatch</td>
<td></td>
<td>(PHONE NUMBER)</td>
</tr>
<tr>
<td></td>
<td>Frequency(s):</td>
<td>( ) Prior to Takeoff</td>
</tr>
<tr>
<td></td>
<td></td>
<td>( ) Each Stop Enroute (optional; negotiated with Dispatcher)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>( ) Arrival At Destination</td>
</tr>
<tr>
<td></td>
<td>4. Satellite-based Automated Flight Following System</td>
<td>2. As specified by the Dispatcher, Check-ins may also be made with another office.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mission</th>
<th>OPTIONS (Flight Following and Resource Tracking Become The Same)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1. Agency VFR With Check-in via radio Every ____ Minutes</td>
</tr>
<tr>
<td></td>
<td>Frequency(s):</td>
</tr>
<tr>
<td></td>
<td>2. Satellite-based Automated Flight Following System</td>
</tr>
<tr>
<td></td>
<td>3. Aerial Supervision With Check-in via radio Every ____ Minutes, Frequency ____ and Call Sign</td>
</tr>
</tbody>
</table>
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 not be conducted if flight following requirements cannot 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.
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 Victor². 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.

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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

![Image of the USDA/USDI Helicopter Pilot Qualification Card]

**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

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OMB No. 0596-0015

USDA – Forest Service

HELECOPTER DATA RECORD
(Reference FSH 5709.16)

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

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

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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.
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 not 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.
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 FAAAdvisory 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**

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

**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.


Except as noted below, or 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.


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.


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.

<table>
<thead>
<tr>
<th>FLIGHT ABOVE GROUND LEVEL</th>
<th>FLIGHT PERMITTED IN WINDS LESS THAN / MAXIMUM GUST SPREAD (in knots)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>TYPE 1</td>
</tr>
<tr>
<td>MORE THAN 500’ AGL</td>
<td>50 / NA</td>
</tr>
<tr>
<td>LESS THAN 500’ AGL</td>
<td>40 / 15</td>
</tr>
</tbody>
</table>

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

**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
- Density altitude
- Weight and balance
- Center of gravity
- HIGE
- HOGE
- Maximum certificated gross weight
- Hover ceiling
- Maximum computed gross weight
- Weight reduction
- Gross weight limitations
- Equipped weight
- Operating weight
- Allowable payload
- Useful load
- Cruise speed
- Fuel consumption
- 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, or
   - +/- 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.
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 helipot 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 Heli bases, 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 helipot 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.
- Resource users should prepare a Project Aviation Safety Plan.
- For large fire operations, extended use will be approved by the Air Operations Branch Director or designee.
- 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 helipot 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**

<table>
<thead>
<tr>
<th>Type</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Touchdown Pad</td>
<td>30’ x 30’</td>
<td>20’ x 20’</td>
<td>15’ x 15’</td>
</tr>
<tr>
<td>Dimension</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Safety Circle Diameter</td>
<td>110’</td>
<td>90’</td>
<td>75’</td>
</tr>
</tbody>
</table>

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**

<table>
<thead>
<tr>
<th>TYPE</th>
<th>I</th>
<th>II</th>
<th>III</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rotor to Rotor Separation</td>
<td>100'</td>
<td>75'</td>
<td>60'</td>
</tr>
<tr>
<td>Pad to Pad Separation</td>
<td>200'</td>
<td>125'</td>
<td>90'</td>
</tr>
</tbody>
</table>

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.
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

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

<table>
<thead>
<tr>
<th>Distance from edge of Safety Circle</th>
<th>Height of Obstacle</th>
</tr>
</thead>
<tbody>
<tr>
<td>80’</td>
<td>10’</td>
</tr>
<tr>
<td>160’</td>
<td>20’</td>
</tr>
<tr>
<td>240’</td>
<td>30’</td>
</tr>
<tr>
<td>320’</td>
<td>40’</td>
</tr>
</tbody>
</table>

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 20° 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 10° on each side of the centerline to determine the optimal, or 20°-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

<table>
<thead>
<tr>
<th>REQUIREMENT</th>
<th>Permanent Helibase</th>
<th>Temporary Helibase</th>
<th>Helispot</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operations office or area for communications/administrative purposes</td>
<td>Required</td>
<td>Required</td>
<td>NA</td>
</tr>
<tr>
<td>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</td>
<td>Required</td>
<td>Required</td>
<td>Required (Handheld Radio Only)</td>
</tr>
<tr>
<td>Ready room/rest area for vendor personnel, including cots, toilet, desks, and, if possible, stove and refrigerator</td>
<td>Required</td>
<td>Required</td>
<td>NA</td>
</tr>
<tr>
<td>Cache for agency-owned equipment</td>
<td>Required</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Storage area for helicopter equipment and servicing supplies</td>
<td>Required</td>
<td>Recommended</td>
<td>NA</td>
</tr>
<tr>
<td>Parking and staging areas for vehicles (for ground-accessible sites)</td>
<td>Required</td>
<td>Required</td>
<td>NA</td>
</tr>
<tr>
<td>Water supply for drinking, utilities, and aircraft maintenance</td>
<td>Required</td>
<td>Recommended</td>
<td>NA</td>
</tr>
<tr>
<td>Maintenance lights, including electrical outlets if possible at each touchdown pad</td>
<td>Required</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Security fence at least 150’ from the center of the touchdown pad on the approach/departure path</td>
<td>Recommended</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>“No Smoking” and other safety and warning signs</td>
<td>Required</td>
<td>Required</td>
<td>Recommended</td>
</tr>
<tr>
<td>Evacuation and Crash rescue Kit</td>
<td>Required</td>
<td>Required</td>
<td>Recommended</td>
</tr>
<tr>
<td>Fire extinguisher located at each pad</td>
<td>Required</td>
<td>Required</td>
<td>Required</td>
</tr>
<tr>
<td>Scales for weighing passengers/cargo</td>
<td>Required</td>
<td>Required</td>
<td>Recommended</td>
</tr>
<tr>
<td>Wind indicators</td>
<td>Required</td>
<td>Required</td>
<td>Required</td>
</tr>
<tr>
<td>, if necessary</td>
<td>Required</td>
<td>Required</td>
<td>Required</td>
</tr>
<tr>
<td>Fueling capabilities</td>
<td>Required</td>
<td>Required</td>
<td>NA</td>
</tr>
<tr>
<td>Identifiable, marked touchdown pads</td>
<td>Required</td>
<td>Required</td>
<td>Required</td>
</tr>
<tr>
<td>Hazard map</td>
<td>Required</td>
<td>Required</td>
<td>NA</td>
</tr>
<tr>
<td>First Aid Kit</td>
<td>Required</td>
<td>Required</td>
<td>Recommended</td>
</tr>
</tbody>
</table>

* 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 not 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):

<table>
<thead>
<tr>
<th>All Helicopter Flights</th>
<th>Fire Resistant Clothing (long sleeved shirt &amp; pants, or flight suit)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Fire Resistant and/or Leather Gloves</td>
</tr>
<tr>
<td></td>
<td>Approved Aviator Flight Helmet</td>
</tr>
<tr>
<td></td>
<td>All-leather Boots</td>
</tr>
<tr>
<td></td>
<td>Hearing Protection</td>
</tr>
</tbody>
</table>

Exceptions or Additional Requirements (all occupants):

<table>
<thead>
<tr>
<th>Reconnaissance Over Water- Beyond Gliding Distance from Shore</th>
<th>Additional Requirements:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Additional Requirements:</td>
<td>Personal Floatation Device (PFD)</td>
</tr>
<tr>
<td>NOTE: Fire resistant clothing and leather boots not required.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Reconnaissance Over Water- Extended</th>
<th>Additional Requirements:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Additional Requirements:</td>
<td>Personal Floatation Device (PFD)</td>
</tr>
<tr>
<td>Anti-Exposure Garments</td>
<td>Raft &amp; Kit</td>
</tr>
<tr>
<td>Exceptions - see ALSE Handbook</td>
<td></td>
</tr>
<tr>
<td>NOTE: Fire resistant clothing and leather boots not required.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Individual Not Restrained by Installed Aircraft Restraint Systems (Spotter, Cargo letdown, Cargo Freefall, ACETA, PSD, etc.)</th>
<th>Additional Requirements:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Additional Requirements:</td>
<td>Approved Auxiliary Restraint Harness/Tether</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Extreme Environmental Conditions (wet, boggy, extreme cold, etc.)</th>
<th>Exception:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rubber/Synthetic Footwear or Clothing</td>
<td>Requires specific agency waiver to policy</td>
</tr>
</tbody>
</table>

| Rappel, Short-Haul, Cargo letdown, Aerial Ignition               | Refer to applicable specialty guide/handbook for specific PPE Requirements. |

<table>
<thead>
<tr>
<th>Firefighter</th>
<th>Exception:</th>
</tr>
</thead>
<tbody>
<tr>
<td>-May wear a hardhat with chinstrap in lieu of an aviator flight helmet only when being transported as passenger during fire operations from an established, managed helispot/helibase to another established, managed helispot/helibase.</td>
<td></td>
</tr>
<tr>
<td>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.</td>
<td></td>
</tr>
</tbody>
</table>
### CHART 9-2: Requirements for Personal Protective Equipment – Ground Operations

#### General Requirements:

<table>
<thead>
<tr>
<th>Requirements</th>
<th>Additional Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Government Personnel – While Working Around Operating Helicopters or When “On the Deck” when Helicopters are Operating</td>
<td>Fire Resistant Clothing (long sleeved shirt &amp; pants, or flight suit) Hardhat with Chinstrap (or approved aviator flight helmet)</td>
</tr>
<tr>
<td></td>
<td>Fire Resistant and/or Leather Gloves</td>
</tr>
<tr>
<td></td>
<td>All-leather Boots Eye Protection Hearing Protection</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>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.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Exceptions or Additional Requirements:

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

### 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.

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**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

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

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.**

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

<table>
<thead>
<tr>
<th>No. of Helicopters</th>
<th>Number And Type Extinguishers</th>
<th>No. Of Crash Rescue Kits</th>
<th>No. Of Evacuation Kits</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-4</td>
<td>1 20-pound 40-B:C Extinguisher per landing pad</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>5-10</td>
<td>1 20-pound 40-B:C Extinguisher per landing pad</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>11 +</td>
<td>1 20-pound 40-B:C Extinguisher per landing pad</td>
<td>1 Kit per every 5 helicopters</td>
<td>1 Kit per every 5 helicopters</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>QUANTITY</th>
<th>ITEM</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Ea</td>
<td>Axe, Crash, Serrated Edge</td>
</tr>
<tr>
<td>1 Ea</td>
<td>Axe, Crash, Smooth Edge Blade, Hacksaw</td>
</tr>
<tr>
<td>10 Ea</td>
<td>Case, Cloth, Carrying, 2-piece Set</td>
</tr>
<tr>
<td>1 Ea</td>
<td>Cutter, Bolt, 24&quot;</td>
</tr>
<tr>
<td>1 Ea</td>
<td>Frame, Hacksaw</td>
</tr>
<tr>
<td>1 Ea</td>
<td>Knife, Rescue,</td>
</tr>
<tr>
<td>1 Ea</td>
<td>Seat-belt Type</td>
</tr>
<tr>
<td>1 Ea</td>
<td>Opener, Door, w/ Claw Tool</td>
</tr>
<tr>
<td>1 Ea</td>
<td>Pliers, 12&quot;, adjustable joint, angle nose</td>
</tr>
</tbody>
</table>
C. Evacuation Kit.

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

**Chart 9-6: Evacuation Kit Components**

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

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.
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.

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).

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1Remote 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).**

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

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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

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

![Diagram of 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**
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 “choke” 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.