Maritime Helicopters

MARITIME HELICOPTERS

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RW STANDARD OPERATING PROCEDURES (SOP)

Appendix B

Revision - 17
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Record of Revisions

This manual will be revised in accordance with Chapter 2 of this manual.

Rev No.	Rev Date	Summary of Changes
15	07/15/2021	All
16	10/01/2022	i, iii, iv, vii, viii, 16-1, 16-2,16-3, 16-4, 16-5, 18-1, 18-2, 18-3, 18-4, 18-5, 18-6, 18-7, 18-8, 18-9, 18-10, 18-11, 18-12, 18-13, 18-14, 18-15, 18-16, 18-17
17	01/01/24	i, iii, iv, ix, 1-1, 24-1, 24-2

List of Effective Pages

PAGE	REV	DATE	PAGE	REV	DATE	PAGE	REV	DATE
i	17	01/01/24	10-1	15	07/15/21	18-9	16	10/01/22
ii	15	07/15/21	10-2	15	07/15/21	18-10	16	10/01/22
iii	17	01/01/24	11-1	15	07/15/21	18-11	16	10/01/22
iv	17	01/01/24	11-2	15	07/15/21	18-12	16	10/01/22
v	15	07/15/21	12-1	15	07/15/21	18-13	16	10/01/22
vi	15	07/15/21	12-2	15	07/15/21	18-14	16	10/01/22
vii	16	10/01/22	13-1	15	07/15/21	18-15	16	10/01/22
viii	16	10/01/22	13-2	15	07/15/21	18-16	16	10/01/22
ix	17	01/01/24	13-3	15	07/15/21	18-17	16	10/01/22
1-1	17	01/01/24	13-4	15	07/15/21	19-1	15	07/15/21
2-1	15	07/15/21	14-1	15	07/15/21	19-2	15	07/15/21
2-2	15	07/15/21	14-2	15	07/15/21	19-3	15	07/15/21
3-1	15	07/15/21	14-3	15	07/15/21	19-4	15	07/15/21
3-2	15	07/15/21	15-1	15	07/15/21	19-5	15	07/15/21
3-3	15	07/15/21	15-2	15	07/15/21	19-6	15	07/15/21
4-1	15	07/15/21	15-3	15	07/15/21	19-7	15	07/15/21
4-2	15	07/15/21	15-4	15	07/15/21	20-1	15	07/15/21
4-3	15	07/15/21	15-5	15	07/15/21	20-2	15	07/15/21
4-4	15	07/15/21	16-1	16	10/01/22	21-1	15	07/15/21
4-5	15	07/15/21	16-2	16	10/01/22	21-2	15	07/15/21
4-6	15	07/15/21	16-3	16	10/01/22	22-1	15	07/15/21
5-1	15	07/15/21	16-4	16	10/01/22	23-1	15	07/15/21
5-2	15	07/15/21	16-5	15	07/15/21	23-2	15	07/15/21
6-1	15	07/15/21	17-1	15	07/15/21	23-3	15	07/15/21
6-2	15	07/15/21	17-2	15	07/15/21	24-1	17	01/01/24
6-3	15	07/15/21	17-3	15	07/15/21	24-2	17	01/01/24
7-1	15	07/15/21	18-1	16	10/01/22	End	of	Pages
7-2	15	07/15/21	18-2	16	10/01/22			
8-1	15	07/15/21	18-3	16	10/01/22			
8-2	15	07/15/21	18-4	16	10/01/22			
8-3	15	07/15/21	18-5	16	10/01/22			
9-1	15	07/15/21	18-6	16	10/01/22			
9-2	15	07/15/21	18-7	16	10/01/22			
9-3	15	07/15/21	18-8	16	10/01/22			

FAA PRINCIPAL OPERATIONS INSPECTOR FAA PRINCIPAL AVIONICS INSPECTOR

Table of Contents

1 Introduction

These procedures are in addition to the guidance found in the Maritime Helicopters Operations Manual. Pilots are expected to be knowledgeable of and comply with all guidance in the Operations Manual as well as the Standard Operating Procedures.

Compliance with Maritime Helicopters Standard Operating Procedures (SOP) is mandatory. No portion of the SOP should be construed as contrary to any Federal Regulation (FAR) or State Regulation.

This document is available online for Maritime Helicopter Inc. employees on the SharePoint site. Contact the Chief Pilot for login information.

Ref: AC 120-71B Standard Operating Procedures for Flight Deck Crewmembers.

2 Manual Revision

The Chief Pilot oversees the creation and revision of MHI controlled operations documents. Changes made to this manual will be summarized in the change summary table and indicated throughout the manual by change bars. A vertical bar (change bar) in the right margin indicates a change, addition, or deletion in the adjacent text for the current revision of that page only. The change bar is dropped at the next revision of that page. The effected paged will also be annotated by updating the revision level and date in the top right-hand corner. The list of effected pages will also be updated.

2.1 Manual Revisions and Control

The Chief Pilot is responsible for the content, currency, completeness, and revisions of this manual. This manual requires FAA approval prior to release. Revisions to this manual must be routed for MHI internal and FAA approval prior to distribution. This manual cannot be published to end users prior to formal submission to and approval by the FAA.

2.2 Manual Approval Process

The MHI Standard Operating Procedure (SOP) is an FAA-approved manual, no changes or revisions will be made without prior FAA approval.

The Chief Pilot will approve this manual and revisions thereof. FAA approval of the manual shall be indicated on the List of Effective Pages (LOEP) by the placement of a signature at the bottom of page of the LOEP in the preformatted area. Upon review and MHI approval, the Chief Pilotor his/her designee will submit a copy of the proposed revision to the cognizant CHDO assigned Principal Operations Inspector (POI) for review and Administrator approval.

If the proposed revision is approved by the CHDO, the LOEP will signed and dated (or stamped) and returned to MHI via e-mail.

If a proposed revision is rejected by the CHDO, an email indicating the date, manual, or revision number of the manual being rejected will be generated. The proposed revision will be returned to MHI with an explanation of discrepancies that must be addressed (the CHDO may retain a file copy of the revision at their discretion).

The non-compliant portion(s) of the revision will be addressed by MHI and resubmitted to the CHDO. This process will be repeated as necessary until FAA approval is obtained. As needed, the Chief Pilot will make contact with the CHDO either by phone, or schedule an in- person meeting to discuss the details of non-compliant portions. This will ensure the MHI SOP is compliant with applicable FAA guidance materials (i.e., CFR's, FAA Orders, etc.).

3 Passenger and Cargo Operations

The vast majority of the operations conducted by Maritime Helicopters Inc. fall into the category of Passenger and Cargo Operations. Proper passenger briefings and cargo loading procedures are essential to a safe operation.

3.1 Task Flight Risk Assessment Profile #9 Residual Risk -LOW

The following hazards are present when conducting passenger and cargo operations:

a. Passengers contacting rotor system when boarding or deplaning aircraft.
b. Passengers carrying loaded weapons in passenger compartment.
c. Loading aerosol bear repellant in passenger compartment.
d. Operating aircraft outside design limits due to cargo loading.

3.2 Normal Procedures

Passenger

Before each flight carrying passengers, the PIC shall ensure that all passengers have received an oral briefing supplemented by printed cards located in the aircraft and convenient to each passenger as outlined in FAR 135.117. This briefing shall include, at a minimum:

1. No Smoking
2. Use and operation of seat belt and shoulder harness
3. Doors/Emergency Exits
4. Location of survival equipment
5. Location and use of ELT
6. Fire Extinguisher Location and Use
7. Loading/Unloading Procedures
8. Main and Tail Rotor Avoidance
9. Oxygen Requirements if the flight involves operations above 12,000 feet MSL. Include the normal and emergency use of oxygen.
10. For extended over water operations, include ditching procedures and the use of required flotation equipment.
11. Emergency Shutdown Procedures to include Fuel System and Electrical System Shutdown as well as the use of the Rotor Brake. (OAS flights)

In addition to the standard passenger briefing above, those passengers who will be boarding or departing the aircraft while the engine is running or the rotors turning will be briefed on proper procedure. At a minimum, this briefing will cover signals from the pilot, direction for approaching and departing (generally from the front, but always by means of the safest route for existing conditions), avoiding the tail rotor area, closing doors securely ensuring that seat belts and straps are not hanging out, proper method for carrying long objects while under the rotor disc, and security of loose objects.

When practical, a crew member will assist in passenger loading and unloading.

No passengers may carry a deadly or dangerous weapon aboard company aircraft without written approval from the Director of Operations, except federal or state personnel who are authorized to carry weapons. The PIC is authorized to carry a weapon. All firearms carried onboard company aircraft will be unloaded.

Aerosol bear repellents (pepper spray) will not be carried in the passenger compartments.

Aerosol bear repellents must be carried in a leak-proof container in the baggage compartment

Cargo

No cargo may be carried in aircraft in other than approved cargo compartments or bins, except the following:

1. If passengers are carried, the cargo must be packaged or covered to avoid possible injury to the passengers.
2. The pilot-in-command shall assure that cargo is properly secured by a safety belt, tie down or other acceptable means to prevent it from becoming a hazard by shifting.
3. The cargo must not impose any load on seats or floor structure that exceeds the load limitations for those components.
4. The cargo must not restrict passenger's access to or use of any required emergency exits, or pilot access to an emergency exit if a regular exit is not accessible to him.
5. The cargo locations must not obscure any passenger's view of any required sign used to instruct or notify him, unless an auxiliary sign or other approved means for proper instruction or notification is provided.
6. Cargo will not be carried above seated passengers.
7. No dangerous, radioactive or magnetized material will be carried on aircraft or handled by company personnel unless all packaging, marking, labeling, notification and necessary documentation has been complied with pursuant to the hazardous materials section of this manual and CFR 49. No hazardous materials will be accepted at remote locations unless prior arrangements have been completed in accordance with procedures contained in the hazardous materials section of this manual.

Landing Areas

See Chapter 4 for Confined Area/Pinnacle Operations.

3.3 Communications

Prior to takeoff the pilot shall confirm that intercom communications with all passengers within the aircraft are operational.

3.4 Weather Minimums

All pilots shall comply with the weather minimums prescribed in the FAR. Pilots also need to be aware that some operations have more limiting minimums prescribed here in the SOP's.

3.5 Emergency Procedures

Pilots shall respond to any emergency as defined in the Rotorcraft Flight Manual. Time allowing pilots shall communicate their emergency on 121.5, another appropriate frequency, or with the Satellite phone installed in the aircraft.

Pilots shall be familiar with the location of the closest hospital or medical facility in the event of injury or illness of a passenger.

If operating in the Homer area the pilot should bring the patient to the Maritime Helicopters Inc. ramp to be transferred to the hospital by ambulance. Every effort should be made to expedite the process through the use of radio/sat phone calls.

3.6 Management Approval

Not utilized.

3.7 Supporting Information

Bell 412 Single-Pilot Operations-

IAW FAR Part 135.113 (Passenger Occupancy of Pilot Seat) When a passenger occupies the Copilot's seat only eight (8) passengers are allowed to occupy the cabin. One of the seats in the cabin must have the seatbelt removed and the following placard attached to the seat "DO NOT OCCUPY" If a passenger doesn't occupy a pilot seat, then 9 passengers may occupy the cabin.

IAW FAR Part 135.99 (Composition of Flight Crew) When the aircraft has a passenger seating configuration, excluding any pilot seat of ten (10) seats or more-Two (2) pilots are required.

NOTE: At no time will the aircraft be configured for more than 9 passenger seats in the cabin for single-pilot operations.

4 Confined Area/Pinnacle Operations

The vast majority of the operations conducted by Maritime Helicopters Inc. fall into the category of Confined Area and Pinnacle Operations.

4.1 Task Flight Risk Assessment Profile #14 Residual Risk -LOW

The following hazards are present when conducting confined area/pinnacle operations:

a. Main/Tail Rotor strike
b. Engine Failure
c. Settling with Power
d. Loss of Tail Rotor Effectiveness
e. Turbulence
f. Downdrafts.

4.2 Normal Procedures

Restrictions

Limitations to the size, location and position of surrounding obstructions are too numerous to list in detail. Use of a landing area must be left to the pilot's discretion. The minimum horizontal obstacle clearance will be at least 12 feet (1/3 rotor diameter, Industry Best Practice) from the main rotor and tail rotor. HOGE performance is required when conducting Confined Area/Pinnacle Operations.

Confined Area

Landing zones (LZs) are generally rough, small, and often sloped. To avoid possible aircraft damage, touchdown must be executed with zero forward airspeed in the forward third of the LZ. A slope landing may be required. After touching down in the LZ, the collective should be lowered gradually until it has been determined the aircraft is securely positioned on the ground. Slight control input assists in determining if the aircraft is secure. If the aircraft is rocking or wobbling in that position, it should be repositioned. Minimize hover turns while in the confined area to prevent a tail rotor strike.

Pinnacles

Important physical characteristics influencing mountain operations include peaks, steep ridges, deep ravines, valleys, limited communication capability, and continuously changing weather. When flying in the mountains, a pilot's senses are often unreliable. The natural tendency is to judge airspeed as too slow and altitude as too high. In addition, pilots tend to decelerate when flying upslope and accelerate when flying downslope. With constantly changing terrain and visual input, flying in the mountains demands a pilot's constant attention, which is divided between the outside environment and the flight instruments. The incorporation of an instrument scan into VFR flying assists pilots in maintaining appropriate airspeed, altitude (MSL and AGL), and rate of climb or descent. This demanding environment requires extensive training and practice.

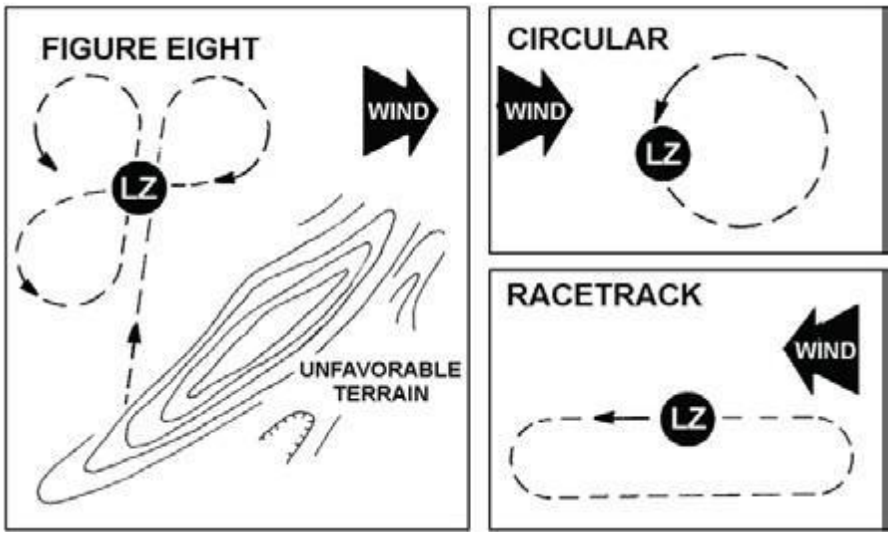
High Reconnaissance

During the high reconnaissance, consideration must be given to determining the approach path. The three recommended flight patterns flown to conduct the high reconnaissance are figure eight, circular, and racetrack. Regardless of the type flown, the following techniques are used:

a. Flight altitude should be high enough to ensure safe operations in case a downdraft is encountered. Wind speed and the nature of the terrain are considered when selecting an altitude.

b. Terrain should be observed while maintaining aircraft airspeed limitations.

c. Flight pattern should be maintained relatively close to the landing area; however, aircraft maneuvers should be limited to bank angles of 30 degrees or less.



The high reconnaissance should assess the following:

a. **Landing zone.** Determine slope, shadowed area, obstacles in and around the LZ, and any surface debris that could damage the aircraft.

b. **Wind.** Determine direction, speed, and location of the demarcation line and any other variables of wind flow.

c. **Takeoff route.** Locate takeoff direction (into the wind) and lowest obstacles, and identify escape routes and forced landing areas, if any.

Low Reconnaissance

The low reconnaissance may be performed to verify information gathered by the high reconnaissance. If the information from high reconnaissance was sufficient, then the low reconnaissance can be combined with the approach. When the aircraft is directly over the touchdown point, altitudes (MSL and AGL) are noted for use during the landing pattern. This knowledge aids pilots in establishing an appropriate traffic pattern altitude, especially when initiating the final leg. In mountainous terrain, the tendency–without this actual LZ altitude information–is to react to the surrounding terrain and fly the pattern too high or too low. If at any time during low reconnaissance it is determined conditions around the LZ are unsafe, reconnaissance is discontinued and the aircraft proceeds to an alternate LZ. The following specific conditions must be evaluated during low reconnaissance:

Pinpoint wind direction and effects of the wind on surrounding terrain; wind indicators observed away from the LZ should be ignored as wind may be different over the touchdown point.

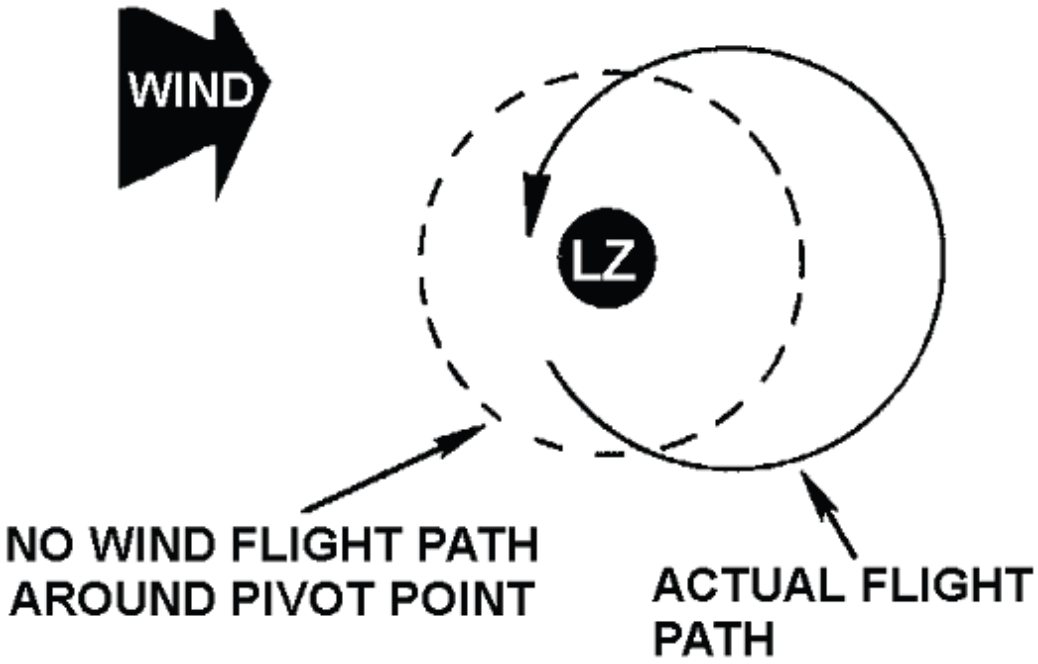
Evaluate the touchdown point, size of the landing area, slope, type of surface, and any obstructions.

a. Determine whether the approach should be terminated to the ground or to a hover.
b. Evaluate the approach path.
c. Identify escape routes.
d. Evaluate the takeoff path.

Wind Evaluation

A portion of the flight path (for low reconnaissance) must be flown over the intended touchdown point to adequately assess the wind. The recommended method for evaluating the wind condition is the circle. When performing this method, pilots fly the aircraft at an altitude slightly above the landing point.

a. **Circle** The pilot selects a pivot point on the ground (LZ) around which a circle will be flown and identifies a starting point about 300 yards from that pivot point. As the aircraft passes over the starting point, the pilot notes the heading and stabilizes the airspeed. The pilot then starts a turn at the pivot point maintaining constant angle of bank and airspeed. As the aircraft passes through the original heading, the pilot should look at the pivot point, which indicates wind direction. Distance from the pivot point will indicate wind velocity.



Approach Paths

Approach paths are common to both high and low reconnaissance. See below for approach paths and areas to be avoided. The five basic factors to be considered for determining the approach path are—

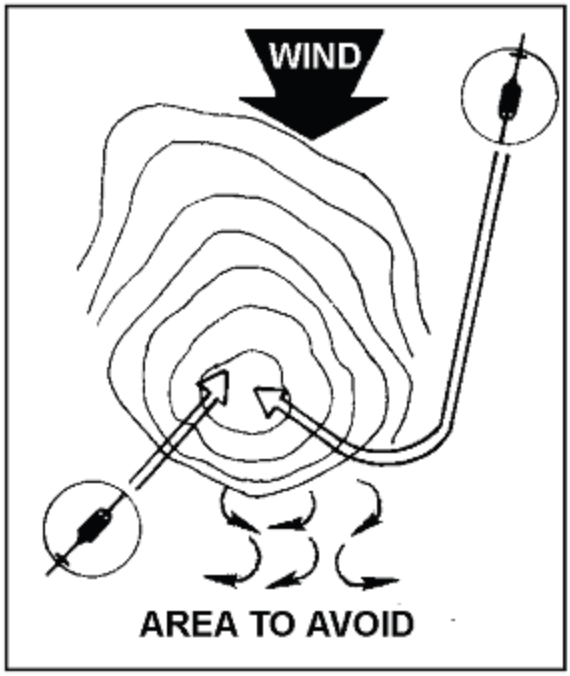
a. **Wind direction and velocity.** While it is desirable to land into the wind, the terrain and the effects of the wind may dictate a crosswind landing be made. Because of torque reaction and aircraft differences, the pilot should decide if a left/right crosswind landing should be made.

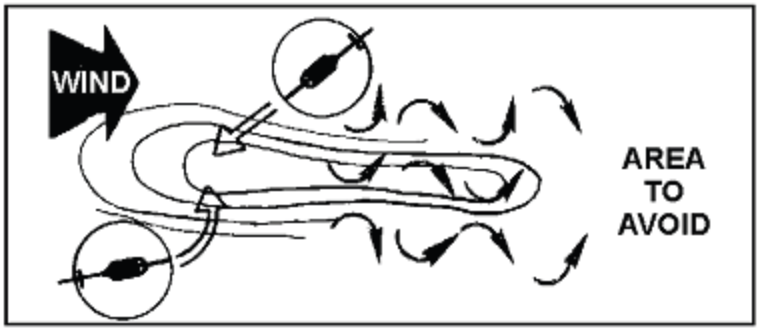
b. **Vertical air currents.** The severity of the updrafts or downdrafts encountered may be more critical than landing into the wind and may require a downwind approach.

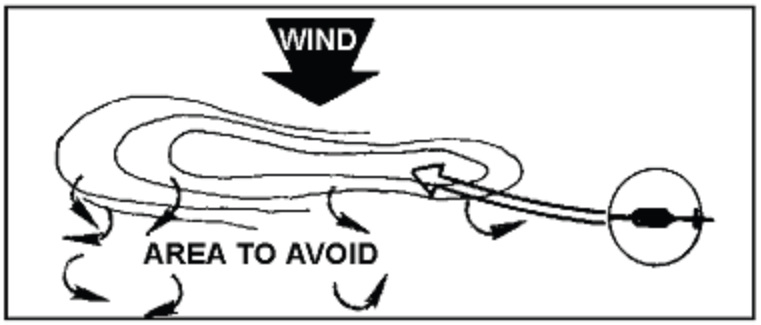
c. **Escape routes.** Assess the escape routes by identifying where altitude can be exchanged for airspeed in case the aircraft experiences insufficient power or turbulence prevents a safe landing.

d. **Terrain contour and obstacles.** Terrain and obstacles along the approach path should be low enough to permit a shallow approach angle into the LZ. When possible, select a landing point on or near the highest terrain feature.

e. **Position of the sun.** Wind direction and nature of the terrain are the primary factors in selecting an approach path. The aviator must also consider, however, the position of the sun in relation to the approach path and the presence of shadows on the LZ. If the landing point is in the shadows, then the approach path should also be in the shadows to eliminate changing light conditions during the approach. An approach directly into the setting sun should be avoided because the distraction will not allow the aviator to see all of the LZ details.







APPROACH AND LANDING

There is no standard type of mountain approach. Ideally, it is made in a direction taking advantage of the wind to provide maximum tail-rotor control. The following are guidelines for a successful approach and landing.

a. In a light wind or when the demarcation line is shallow, an aviator uses a relatively low angle of descent or a flat approach. This type of approach requires less power; however, if downdrafts are encountered, the aircraft may lack altitude to continue the approach.

b. As wind velocity increases and the demarcation line becomes steeper, the approach angle must also be steeper. This type of approach requires less power due to updraft and provides more terrain clearance if downdrafts are encountered.

c. During a mountain approach, be aware uneven terrain surrounding the LZ can provide poor visual cues about the actual aircraft altitude (AGL) and rate of closure. When terrain slopes up to the LZ, the visual illusion leads an aviator to believe the aircraft is too high and the rate of closure too slow. When terrain slopes down to the LZ, the visual illusion leads an aviator to believe the aircraft is too low and the rate of closure too fast. When the LZ is a pinnacle and the surrounding terrain drops off sharply, it seems the aircraft is too high and the rate of closure initially too slow. As the aircraft closes the distance to the LZ, the rate of closure will appear excessive. These conflicting cues must be evaluated by cross-referencing visual cues with information on the flight instruments. The aviator must make appropriate adjustments.

d. After the low reconnaissance is completed, the aircraft is flown into a traffic pattern and the approach initiated. Where terrain conditions permit, the traffic pattern should be standard. When deviating from the standard pattern, an adequate distance on final approach is maintained to avoid descents greater than 300 FPM. Pattern altitude, depending on the terrain, will not normally be flown more than 500 feet above the LZ altitude. The pattern is flown over terrain where minimum downdrafts exist.

e. The primary difference between the short final phase of a mountain approach and a flatland approach begins when the aircraft is approximately 50 feet above touchdown. To begin losing ETL, the aircraft slows but not to an OGE hover. Before reaching the near edge of the LZ, descent is halted and airspeed reduced to a brisk walk. Torque is noted and a decision made to continue the approach or to abort.

f. If it is determined the approach is unsafe in any way, the pilot initiates a go-around. Where escape routes exist, the aircraft is turned away from the mountain and flown appropriately. This normally consists of progressive acceleration, carefully-managed power (airspeed over altitude takeoff, if possible), and minimal bank angles established. The point is to execute appropriate control input predetermined on high and low reconnaissance, being careful to minimize control input, with minimum power application and precise handling of the aircraft. As always, an emergency may demand more aggressive action. Each situation is different and must be evaluated separately. The pilot should take nothing for granted and be prepared for the worst possible scenario, such as engine failure, loss of tail rotor effectiveness, and downdrafts. Potential problems must be discussed ahead of time and proposed actions considered and reviewed.

g. Mountain LZs are generally rough, small, and often sloped. To avoid possible aircraft damage, touchdown must be executed with zero forward airspeed. A slope landing may be required. After touching down in the LZ, the collective should be lowered gradually until it has been determined the aircraft is securely positioned on the ground. Slight control input assists in determining if the aircraft is secure. If the aircraft is rocking or wobbling in that position, it should be repositioned.

Takeoff

Because the terrain is steeper around mountain LZs, gaining airspeed is usually more important than gaining altitude. Airspeed over altitude takeoff is preferred whenever possible.

a. Pilots must consider wind condition and terrain to determine takeoff direction. Takeoff should be conducted into the wind and over the lowest obstacles and descending terrain. Mountainous terrain usually demands a compromise between these factors. Takeoff checks must include a hover power check.

b. A pinnacle takeoff is usually initiated from the hover after completing the power check. After lifting off, the pilot applies torque and change in pitch attitude to accelerate or climb as planned. When terrain obstacles prevent airspeed over altitude takeoff, a confined area takeoff should be performed with appropriate airspeed and altitude selected for continuing flight.

4.3 Communications

Not used

4.4 Weather Minimums

Not used.

4.5 Emergency Procedures

Pilots shall respond to any emergency as defined in the Rotorcraft Flight Manual. Time allowing pilots shall communicate their emergency on 121.5, another appropriate frequency, or with the Satellite phone installed in the aircraft.

4.6 Management Approval

Not used.

4.7 Supporting Information

Not used

5 Cold Weather Operations

Cold weather operations cover a wide range of conditions. This section is designed to remind pilots of the many possible hazards associated with flying in cold conditions.

5.1 Task Flight Risk Assessment Profile #13 Residual Risk -LOW

5.2 Normal Procedures

Both Engine Anti Ice and Pitot Heat shall be on in visible moisture when the ambient temperature is below 40° F as per the requirements of the RFM. The pilot will monitor the TOT when selecting Anti Ice ON to ensure the Anti-Ice is functioning.

5.3 Communications

Not Used.

5.4 Weather Minimums

Helicopters will not be operated in areas that are conducive to flat light/whiteout conditions, which include the North Slope of Alaska, mountain passes above tree line, glaciers, and other areas of flat featureless terrain, unless the in-flight visibility is at least:

a. 1 mile during daylight hours **AND**

b. A visual surface reference, which would allow a safe landing, is maintained at all times **AND**

c. A visible horizon that distinguishes the sky and ground **AND**

d. The aircraft is equipped with an operational radar altimeter.

The minimum ambient air temperature limitation for operation varies for the types of helicopters operated by Maritime Helicopters Inc. Operation shall be in accordance with the RFM. However, for flight operations below -35° F, Tier 1 approval is required. When conducting operations at these extreme temperatures the type of fuel used is also of concern and is covered in the following section.

- Bell 206B3 Jet Ranger: No minimum temperature is outlined in the limitation section. -40° F shall be used as the limitation by Maritime Helicopters Inc.
- Bell 206L3 Long Ranger: -58° F as per limitation 1-11. Bell 206L4 Long Ranger. -40° F
- Bell 407: -40° F as per limitation 1-11.
- BO 105: -45° F as per limitation 2.10.1

NOTE: The minimum temperature for the use of Jet A will be IAW the applicable RFM.

5.5 Emergency Procedures

Pilots shall respond to any emergency as defined in the Rotorcraft Flight Manual. Time allowing pilots shall communicate their emergency on 121.5, another appropriate frequency, or with the Satellite phone installed in the aircraft.

If icing conditions are encountered the pilot must respond immediately to remove the helicopter from icing conditions with a 180° turn or change in altitude.

5.6 Management Approval

Tier 1 approval is required for operations below -35° F.

5.7 Supporting Information

Freezing Rain:

All Maritime Pilots will be knowledgeable of the conditions necessary for Freezing Rain. In Alaska freezing rain is more common during the Spring and Fall than the Summer and Winter.

Precipitation falling through a layer of air warmer than 32° F into air that is below 32° F creates freezing rain. This can occur with or without frontal activity and at any altitude.

The first area of the aircraft where ice will be noticed is on the lower, most forward, portion of the windshield. If this happens immediate action shall be taken to get out of the icing conditions.

Generally a 180° turn back out of the icing conditions is the best solution. A change in altitude may also be required.

White Out vs Flat Light:

White out conditions and flat light conditions are two distinctly different problems pilots might encounter.

White out is when the aircraft is enveloped in snow to the point the pilot loses his/her visual references. This most often occurs when coming in for landing or taking off in an area with fresh snow. The snow from the surface gets blown up by the downwash and obscures the visual references used by the pilot. In order to avoid this situation the pilot shall make approaches at a slower rate into areas with fresh snow and watch for the “cloud” of snow to develop slightly behind the aircraft. If a cloud of snow is observed the pilot shall either execute a go around or if power permits he/she may elect to sit in a high hover, where visual reference can be maintained, and blow the fresh snow clear. The same can be done prior to lift off when taking off from an area with fresh snow.

Flat light conditions can be present in a variety of areas ranging from snow covered to over open water. The thing they all have in common is a lack of visual reference available to the pilot to determine the altitude and/or attitude of the aircraft. The most common situation is on an overcast day with complete snow cover. It becomes impossible to perceive the height of the aircraft over the terrain even with unlimited visibility. Pilots shall also pay close attention on a sunny day when landing in a shadowed area. If flat conditions are encountered pay close attention to the Radar Altimeter and fly a flight path that will allow you to keep visual reference with terrain.

Surface Snow Condition:

When landing on a snow-covered area it is impossible to be sure of what is under the snow. It can also be difficult to know if the snow will support the aircraft. One of the most dangerous conditions occurs when a layer of crusty snow develops on top of a layer of soft snow. This occurs in areas with strong winds, when it rains on snow and then freezes or with a freeze thaw freeze cycle that melts and then refreezes the top layer of snow.

The danger with this snow condition is that the aircraft my break through the crust with only one skid or only part of one skid causing a potential Dynamic Rollover. Even if both skids break through extra care must then be taken when taking off to prevent the skids from catching underneath the layer of crust. In order to prevent this the pilot can keep power applied when dropping off passengers and find another landing site or have the passengers stomp down a landing area. **NOTE:** Be cautious of tail rotor clearance in deep snow.

6 External Load/Vertical Reference Operations

Helicopter flying with underslung loads requires special precautions to be taken if both the helicopter crew and third parties are to be protected from undue risk. This publication contains advice on various aspects of external load operations. A full and comprehensive briefing should be carried out with all staff involved in the operation.

6.1 Task Flight Risk Assessment Profile #5 - LOW

The following hazards are present when conducting vertical reference operations:

a. Blowing debris during landing/takeoff.

b. Inadequate rigging.

c. Inadequately trained personnel.

d. Snagged cable on ground.

e. Reduced aircraft performance.

f. Settling with power.

g. Inadvertent release of cargo.

h. Empty cable contacts tail rotor during flight.

i. Downdrafts/Gusty winds.

j. Failure of lifting equipment.

k. Fuel exhaustion.

l. In-flight loss of control of the load.

m. Engine failure while operating within the height/velocity diagram.

n. External load operation.

o. Uncontrolled personnel in the helicopter landing area.

6.2 Normal Procedures

The following procedures will be followed by Maritime Helicopters Inc. pilots during external load/vertical reference operations unless following them presents a safety concern for the specific operation being conducted. Due to the dynamic nature of external load/vertical reference operations it is essential the pilot takes all variables into consideration.

Pre-Flight and Pre-Flight Briefing:

Both electric and manual releases will be checked before external load operations are conducted. Operations will be suspended if either release in not operating. The electric release on the remote hook shall also be checked if used.Text inserted here. (Norm 2)

Prior to any external load operations all Maritime Helicopters pilots shall ensure that all ground crew personnel are briefed on the following items in addition to the standard passenger briefing:

1. Hand signals to be used. This should be briefed even if radio communications are available between the pilot and ground crew in case of radio problems.
2. The order in which loads will be taken. Generally lighter loads are picked first and heavier loads are picked after fuel is burned off.

3. The maximum weight the pilot is comfortable picking.
4. Emergency procedures to include the direction ground crew should move in case of an engine failure.

Equipment:

1. All equipment shall be inspected prior to use. Pay special attention to the condition of slings and nets to ensure sewed connections are secure and no fraying is present.
2. All hooks used will have an operational spring gate.
3. A swiveling hook will be used to prevent lines from being twisted in flight.
4. Only metal rings will be attached to the hook on the aircraft. This is to prevent any sling or rope from twisting itself on the hook thereby preventing it from being released be the pilot.
5. Pilots will land in such a way to avoid landing on the line.
6. The length of line used will be at the discretion of the pilot and should allow for obstacle clearance in all areas of operation.

Other Requirements:

In some cases it is necessary for the pilot to exit the aircraft with it running to hook or unhook a load or adjust the rigging of a load. Extreme caution shall be used in these cases. Prior to exiting the aircraft the pilot will roll the throttle down to idle, tighten all control frictions, and select the hydraulic system to the off position. Time out of the aircraft shall be kept to a minimum. Pilots will ensure the hydraulic system is restored, the frictions are adjusted, and the throttle is set prior to continuing operations.

Pilots taking off unaware that the long line is still hooked to the belly has caused many accidents. To prevent this, if the aircraft is shutdown the pilot shall release the line from the belly of the aircraft.

When flying with an empty cable attached, the aircraft will be operated at an airspeed not to exceed 80 kts.

6.3 Communications

The use of radio communications between the pilot and ground crew is the preferred method of communication. If radio communications are not available hand signals shall be used. It is important that the ground crew is properly briefed on the hand signals to be used.

6.4 Weather Minimums

Wind: Any operations conducted in more than 25 Kts or with a gust spread of more than 15 Kts. requires Tier 1 approval.

Weather: A ceiling that allows for 300’ of clearance between the load and terrain with 1 mile of visibility

6.5 Emergency Procedures

Pilots shall respond to any emergency as defined in the Rotorcraft Flight Manual. Time allowing pilots shall communicate their emergency on 121.5, another appropriate frequency, or with the Satellite phone installed in the aircraft.

Engine failure during a hover while hooking up sling load, release cargo and move to the side of the load that the ground crew have been briefed to remain clear of while performing hovering autorotation.

Engine failure during takeoff, release cargo and turn slightly to either side of the take off track if possible to avoid load skipping into helicopter while performing hovering autorotation.

Engine failure during flight; enter autorotation, then if altitude permits determine if the area below the helicopter is suitable to jettison the cargo without damage to persons or property on the surface. If possible release sling load and change heading before completing autorotation.

In the case of a cargo hook release malfunction check to see if the circuit breaker is in, if so use manual release. Discontinue sling load operations until problem is corrected.

6.6 Management Approval

Tier 1 approval is required when any operations conducted in more than 25 Kts or with a gust spread of more than 15 Kts.

6.7 Supporting Information

Maritime Helicopters Inc. External Load Powerpoint.

7 Night Operations

At this time Maritime Helicopters Inc. conducts all night operations unaided, meaning without the use of Night Vision Goggles (NVG's). As such the pilot must rely on artificial lighting on the surface or adequate celestial illumination to maintain visual reference with the surrounding terrain and horizon.

7.1 Task Flight Risk Assessment Profile #10 Residual Risk -MODERATE

The following hazards are present when conducting night operations:

a. Reduced visual references at night.

b. Reduced pilot proficiency due to infrequent operations at night.

c. Increased likelihood of damage during night forced landing.

d. Controlled flight into terrain.

7.2 Normal Procedures

In addition to the normal preflight procedures pilot are encouraged to become familiar with switch and knob placement in the aircraft they are operating as there are subtle differences between Maritime Helicopters aircraft. Pilots shall have a flashlight (2-D cell or equivalent) available for use in the cockpit should any aircraft lighting become inoperative. All night landings will be mad to a prepared surface, unless otherwise approved.

In order to carry passengers at night, the limits of the area to be used for landing or takeoff are clearly shown by boundary or runway marker lights or reflective material and the pilot has determined the wind direction from an illuminated wind direction indicator or local ground communications or, in the case of takeoff, the pilot’s personal observations. Additionally the pilot must have conducted 3 takeoff’s and landings within the previous 90 days as outlined in FAR 135.247 (a) (s). Night landing will be made to a prepared surface unless otherwise approved.

7.3 Communications

Not Used.

7.4 Weather Minimums

The pilot must maintain visual reference with the surface at all times. The cloud and visibility requirements needed to maintain reference can vary greatly based on the area the flight is conducted over and is therefore not regulated in this section.

7.5 Emergency Procedures

Pilots shall respond to any emergency as defined in the Rotorcraft Flight Manual. Time allowing pilots shall communicate their emergency on 121.5, another appropriate frequency, or with the Satellite phone installed in the aircraft.

A major concern of most pilots flying at night is an engine failure or other emergency that requires an immediate landing. Assuming a restart is not possible the more altitude you have allows you more time to come to a suitable decision on the best spot for landing. Determining the obstacles below you at night may not be possible. Use your best judgment remember that it's better to do a good autorotation to a bad spot than a bad autorotation to good spot.

7.6 Management Approval

Tier 1 approval is required for all night operations (EECT to BMCT).

7.7 Supporting Information

Pilots shall be familiar with the visual illusions common at night. Information can be found in 8-1-5 and 8-1-6 of the AIM. Also refer to 10-2-2 of the AIM.

8 Powerline/Utility Operations

There are over 5,000 collisions with poles or wires in the FAA database. The following information should be given careful consideration prior to conducting Power Line or Utility operations.

8.1 Task Flight Risk Assessment Profile #6 Residual Risk -MODERATE

The following hazards are present when conducting power line and utility operations:

a. Collison with static wires, guy wires or conductors.

b. Unable to see wires in flight path when landing or take off.

c. Loss of aircraft performance due to loss of translational lift, LTE, or OGE hover.

d. Canetary or suspension cables.

e. Collision with structures or towers.

f. Controlled flight into terrain.

g. Engine failure while operating within the height/velocity diagram.

h. Settling with power.

i. Loss of tail rotor effectiveness.

j. Bird Strikes.

k. Loss of situational awareness due to sun, low light or haze.

l. Landing with inadequate main/tail rotor clearance.

m. Inadequate training or proficiency of the crews involved.

n. Long line snags on ground, trees, or structures.

8.2 Normal Procedures

In addition to standard passenger briefing requirements, pilots should brief line crews that they are flight crew and encourage their inputs. They are not only valuable, but critical to safe flight operations. Pilots will ensure that communication exists between ground crews and the helicopter for utility operations.

WARNING; Do not operate below power lines, guy wires, structure, etc.

When in the low-level wire environment and when making approaches near obstructions, make sure line crew as well as the pilot are calling out obstructions to the flight path.

8.3 Communications

Good communication with ground crew personnel is essential. Maritime Helicopters Inc. frequently works with HEA in and around the Homer area. When operating with HEA personnel confirm which HEA frequency will be used for the operation and perform radio checks prior to beginning flight operations.

8.4 Weather Minimums

Maritime Helicopters Inc. does not have any specific weather requirements for this type of operation. That said the pilot must give wind velocity and direction particular attention when working around wires and structures.

8.5 Emergency Procedures

Pilots shall respond to any emergency as defined in the Rotorcraft Flight Manual. Time allowing pilots shall communicate their emergency on 121.5, another appropriate frequency, or with the Satellite phone installed in the aircraft.

8.6 Management Approval

Management will only assign specific pilots/crewmembers to power line/utility operations.

8.7 Supporting Information

Crew Resource Management:

It is imperative that pilots maintain Situational Awareness at all times while flying, but especially when operating in the wire and obstruction environment. Exposure to this environment must be understood in order to minimize the risks involved. The amount of Exposure to this hazard has to do with three things:

- Proximity to the Wire
- Complexity of the System (factor of altitude AGL)
- Rate of Change in environment (Factor of Airspeed)

Crew resource management (CRM) is the formal, mandatory process that requires crews to share timely “flight critical” information pertaining to all phases of the flight. Lineman/utility workers on board or on the ground should be considered a valuable “crew resource” provided they have communication capability. They can certainly provide flight-critical information to the pilot. CRM has only recently been discovered as being something vital to emphasize in the helicopter utility operations community. Effective communication is vital for CRM to be successful. In-flight communication must be Clear and Understood. This can be done by keeping the communication loop open by asking questions and expecting answers.

If any of the crew observes an unsafe situation developing they must verbalize this immediately.

This means situational awareness has been compromised by someone on the crew. It serves as a warning to the pilot that the operation should be discontinued immediately. Once the crew is out of danger there will be time to discuss and correct the issue.

Wire Environment:

Terrain, background, atmosphere and sun angle have a great deal to do with how well you can see the wires and obstructions. When operating in this environment, the pilot and crews should immediately verbalize any obstructions near the flight path. Crews must not assume the pilot sees the obstruction unless the pilot has verbalized it.

WARNING: Do not operate BELOW wires.

Remember that the insulators on the structures will indicate what direction the wires are traveling. They are an especially useful indicator when the wires change direction.

It is extremely difficult to judge your distance from the lines solely by reference to the wire itself. Constantly focus and refocus your eyes, slow down and keep adjacent structures in sight.

Be aware of guy wires. They are present not only around large antennae structures, but also are located on the last pole of a power line. They may be down, overhead, or ascending guy wires.

Aerodynamic Considerations:

Pilot inattention when flying low and slow in this environment can lead to decreasing aircraft performance. Left unchecked, the condition(s) can lead to an accident. For example:

- Loss of Translational Lift
- Loss of Tail Rotor Effectiveness
- Hovering Out of Ground Effect

9 Offshore Platform Operations

On occasion Maritime Helicopters Inc is used to support operations on offshore platforms/rigs in the upper Cook Inlet. Operations include personnel transport; internal cargo loads and external cargo loads. Pilots shall be 133 qualified and current to fly this operation.

9.1 Task Flight Risk Assessment Profile #4 Residual Risk -LOW

The following hazards are present when conducting Offshore Platform operations:

a. Turbulence encountered during landing or take off.

b. Loss of ground effect.

c. Mid-air collision with other platform traffic.

d. Operations near gas venting booms.

e. Landing on rigs/platforms during venting.

f. Presence of Hydrogen Sulfide Gas.

g. Helicopter-Crane operations.

h. Perforation Operations.

i. Landing on an unsafe “RED” deck.

9.2 Normal Procedures

The pilot shall coordinate with dispatch the day prior to flight operations to get an idea of the missions that are planned and what time they would like to start flying. If there are personnel to take out they will meet you at the heli-pad and the dispatcher will help load passengers and cargo. The dispatcher will inform you which rig the passengers and cargo are going to and if there are any returning passengers or cargo. You will be given a passenger manifest by dispatch and by the personnel on the rigs that you bring back to shore. All manifests shall be turned in to the dispatch office at the end of the day.

When departing contact the rig on the FM to inform them you are inbound and provide them with an ETA. When you are approximately two minutes out call and confirm a green deck. When approaching the rig pilots shall be aware of wind direction and velocity and attempt to predict any turbulence created around the superstructure of the rig.

When conducting offshore external load/vertical reference operations, set all external loads close to a corner of the helipad on the rig and hover down as low as possible before releasing the sling. When setting an external load down back onshore, make sure it is out of your way for landing and fueling. The loads may be there for a day or two before they are moved.

Your day will normally last from sunrise to sunset September to March and then from 06:00 to 18:00 during the spring and summer.Subject

When operating out of the XTO hangar the helicopter is parked on a platform cart. There is a truck on location that the pilot shall use top tow the aircraft out and push it back in

There is a nice facility provided at XTO for the pilot. The three-bedroom apartment has a kitchen, TV, and Internet etc.

Restrictions:

Avoid overflight of Rigs/Platforms by either 3nm laterally or 2000' vertically when Cold Gas Flaring is taking place.

When landing on Rigs/Platforms during gas venting, the following must be met:

1. Plan the approach and takeoff to observe and avoid the downwind or directly over the gas vent, remaining as far away as practicable from the open end of the vent boom.
2. Aircraft operating to an installation during 'COLD FLARING' MUST ensure that their approach, landing area and departure path will be well clear of the unlit plume. When this cannot be achieved, the Pilot in Command will suspend operations. Consideration must also be given to suspending operations with wind speed below 5 kts as gas may be present around the installation.
3. Downwind landings will only occur after the concentration is confirmed to be less than 10% of Lower Flammable Limit (LFL).
4. Except in an emergency, aircraft will not be shutdown offshore during 'COLD FLARING' due to the possibility of a change of wind direction.

When operating in offshore areas that have been identified as having concentrations of Hydrogen Sulfide gas pilots will ensure the following:

1. An approved protective air pack is available for the crew.
2. When shutdown on the helideck know the location of protective equipment and safety procedures of the specific platform. When flying near a helideck and a visual red alarm or "rotten egg" smell is detected, immediately don the protective mask and exit the area upwind.

Prior to approaching, maneuvering, running on the platform with a crane, the pilot will ensure that either the crane boom is cradled or the boom is pointed away from the helipad and that the operator is out of the cab.

A NOTAM will be issued when a drilling rig is conducting perforating operations that close the helideck. A visual indication that perforation operations are ongoing is a WHITE "X" and a sign "NO RADIO" in red.

Communications

When operating in the Upper Cook Inlet the UNICOM frequency for all of the rigs is 123.05 and CTAF is 122.7.

Self-announce on CTAF enroute and communicate directly with the rig on 123.05. The XTO dispatch and the rigs also have an FM frequency. The frequency shall be confirmed with dispatch prior to flight operations.

9.3 Weather Minimums

Weather minimums vary from client to client, the pilot is expected to operate within the restrictions imposed by each client.

XTO's prescribed weather minimums are 1000 foot ceiling and 3 miles visibility. There are no weather reporting sites in the immediate area. However, there are visual landmarks that can be used as a reference. The most obvious one is the golf ball type radar station about 1.5 miles east of the XTO hanger. Each rig can also give you an estimate of the visibility.

Contact your destination rig prior to leaving the shore if in doubt.

9.4 Emergency Procedures

Pilots shall respond to any emergency as defined in the Rotorcraft Flight Manual. Time allowing pilots shall communicate their emergency on 121.5, another appropriate frequency, or with the Satellite phone installed in the aircraft.

9.5 Management Approval

The dispatch office will give you the schedule for the day first thing in the morning or sometimes the night before. This will constitute management approval for the job. As always the pilot has the final say if he can do the mission safely.

9.6 Supporting Information

10-2-1 in the AIM

10 Search and Rescue Operations

The helicopter is an excellent resource in the Emergency Medical Service (EMS) system. It can make the difference between life and death simply by reducing the time it takes to get a patient proper medical care. Unfortunately, it is also one of the segments of the helicopter industry with the highest accident rate. Poor weather conditions combined with a sense of urgency or importance of the mission combine to create an unsafe operation. Most dedicated EMS helicopters operate single pilot with two medical crew members and coordination between the crew members is very important.

Maritime Helicopters Inc. does not operate a full time EMS program. Therefore, each mission will vary from the next based on available crew and equipment. It is imperative to the safety of the operation that the pilot remember his responsibility is to the safe operation of the aircraft and to the safety of his crew. Subject

10.1 Task Flight Risk Assessment Profile #7 Residual Risk -LOW

The following hazards are present when conducting Search/ Rescue/EMS operations:

a. Landing with inadequate main/tail rotor clearance.

b. Inadequate preflight planning due to sense of urgency.

c. Flight in weather below established minimums.

d. Blowing debris contacting rotor system.

Restrictions

The pilot will ensure that the landing area allows a 1/3 diameter rotor clearance (12') for all landings..

10.2 Communications

In the dispatch phase of an EMS flight it is preferred that the pilot receive little to no information regarding the patient. This is to prevent the decisions made by the pilot from being influenced by outside factors.

Ground crew at Maritime Helicopters as well as pilots shall be trained and familiar with how to install the litter kit in the various models of aircraft Maritime Helicopters Inc operates. The litter kit shall be installed on EMS flights departing from the Maritime Helicopters Inc base.

When conducting Search and Rescue (SAR) operations the pilot must coordinate with appropriate agency to determine the search target area and search radius. If possible a spotter or spotters shall accompany the pilot to aid in the effectiveness of the search. Weather Minimums

10.3 Weather Minimums

Maritime Helicopters Inc. does not have any specific weather requirements for this type of operation.

10.4 Emergency Procedures

Pilots shall respond to any emergency as defined in the Rotorcraft Flight Manual. Time allowing pilots shall communicate their emergency on 121.5, another appropriate frequency, or with the Satellite phone installed in the aircraft.

10.5 Management Approval

Management will only assign specific pilots/crewmembers to Search/Rescue/Medevac operations..

10.6 Supporting Information

Refer to 10-2-3 in the AIM.

11 Volcano Operations

Maritime Helicopters frequently supports Alaska Volcano Observatory scientists as well as other Government agencies in their research on and around over forty active Alaskan volcanoes. This frequently involves Flights & landings on or near volcanoes to provide surveillance and access to equipment or personnel.

11.1 Task Flight Risk Assessment Profile #8 Residual Risk -MODERATE

The following hazards are present when conducting Volcano operations:

a. Operating aircraft with ash/debris cloud.

b. Loss of references due to blowing ash while landing.

c. Operating aircraft within steam/gas cloud.

d. Landing on surface during changing conditions.

11.2 Normal Procedures

A TFR may be established around active volcanoes. Check with AVO or the local FSS to make sure you are cleared to enter the TFR prior to flight operations.

Volcanoes pose many hazards to safe flight operations including: steam and/or poisonous gases, explosions of rock and debris, and ash clouds. Remain well clear of all steam/ash clouds at all times. What appears to be only a steam may contain ash as well. Ash ingested into the engine can result in a flameout and/or a reduction in performance. Ash can be encountered in many forms from a very fine powder to small pellets and it may be encountered in any flight condition to include clear air at any altitude. The ash may also eliminate visual references and/or cause permanent damage to the aircraft. The pilot will monitor the TOT & other performance instruments when in conditions that could cause damage to the engine. If ash is encountered a PIREP should be reported.

Pay particular attention to landing spot selection near water features. Water levels in creeks and rivers can rise rapidly with no warning. Be aware of local weather phenomena as a result of rising steam plumes and of possible brownout upon landing caused blowing ash.

Prior to flight operations the pilot shall be familiar with landing site elevations and ensure aircraft performance is adequate. When approaching the landing spot the pilot shall perform a high and low level recon and perform an inflight power check prior to landing.

The pilot shall carry proper clothing and personal equipment specific to the mission. Consider temperature and duration of stay on the volcano. It is recommended that you carry a pair of snowshoes in order to walk off the volcano.

11.3 Communications

AVO uses both radio communications as well as satellite phones. Determine the communication plan prior to flight operations. Ensure communications can be maintained with dispatch when working on an active volcano.

NOTE: In most cases cell phones are not considered a reliable means of communication.

11.4 Weather Minimums

Ash Clearance: Remain upwind and well clear of any ash. If ash is encountered, a 180° degree turn is most likely the best course of action.

- Wind: AMD wind limitations must be complied with.
- Take-off and landing: 30 kts maximum with a maximum gust spread of 15 kts
- Inflight: 50 kts maximum.
- Visibility: ½ mile

11.5 Emergency Procedures

Pilots shall respond to any emergency as defined in the Rotorcraft Flight Manual. Time allowing pilots shall communicate their emergency on 121.5, another appropriate frequency, or with the Satellite phone installed in the aircraft.

In the event of a sudden eruption leave immediately. Personnel safety is the priority in this situation. The Pilot will determine the best course of action depending on the current condition to avoid flight in ash.

11.6 Management Approval

Management will only assign specific pilots/crewmembers to Volcano operations.

12 Heliskiing/Helisnowboarding Operations

On occasion, Maritime Helicopters is requested to carry Guides and small parties of Skiers to remote permitted locations in support of Heli-Ski Operations. This type of operation involves all the hazards of Cold Weather and High-Altitude Mountain operations at high gross weights. Risk Management is something that must be considered and planned for every flight. Remember, this is just done for "fun"!!

12.1 Task Flight Risk Assessment Profile #11 Residual Risk -MODERATE

The following hazards are present when conducting Heliskiing operations:

a. Loss of visual references during landing or takeoff.

b. Passengers contacting rotor system when boarding or deplaning aircraft.

c. Landing on unstable surface.

12.2 Normal Procedures

Prior to beginning Heli-Ski operations, a thorough briefing and orientation flight should be accomplished so the Pilot and the Guide(s) are thoroughly familiar with the following:

General Helicopter Safety

Base area Operations & Procedures

Weather Planning / Cancellation / Abort Procedures Communications Procedures & Frequencies Aircraft configuration in:

- Normal Ops
- Medevac Ops Helicopter Performance Fueling Areas & Procedures

Permit Area Boundaries & Operational Area Possible / Planned Landing Areas Avalanche Procedures

Overnight Parking & Aircraft Protection/Heating Procedures in case of Mechanical Problems

Establish procedures in case of a mechanical problem with the aircraft. This will include recovery of the people in the back country (if applicable) and whatever arrangements that will need to be made to resolve the problem or provide a replacement aircraft.

Restrictions.

During all landings, don't let the power out until a stable surface is confirmed; do not land on cornice or avalanche-prone areas; do not allow passengers to depart or approach aircraft until stability assured.

12.3 Communications

Normal - Air to Ground = VHF AM / FM Emergency & Medi-Vac - Local Hospital Frequencies and/or contact info. as well as contact procedures for local search & rescue and/or US Coast Guard.

12.4 Weather Minimums

These limits should be coordinated & agreed upon prior to starting the actual flights and as usual, the PIC is the final authority on whether a flight is made or not!

12.5 Emergency Procedures

AIRCRAFT RELATED - Pilots shall respond to any emergency as defined in the Rotorcraft Flight Manual. Time allowing, pilots shall communicate their emergency on 121.5, or another appropriate frequency, or utilize the Satellite phone installed in the aircraft.

MEDICAL – Communicate the nature of the emergency with the local base of operations (if able) or the nearest medical facility. If Search & Rescue or the USCG is needed, coordinate with them utilizing the appropriate contact info.

AVALANCHE – Initiate established communications plan and proceed with the initial search. Depending on the situation, the resources needed may necessitate involving local search & rescue or the USCG.

12.6 Management Approval

Tier 1 management approval is required prior to conducting Heliskiing Operations –

Management will only assign specific pilots/crewmembers to heliskiing operations.

12.7 Supporting Information

Heliskiing operations require mountain-flying techniques and special attention to aircraft performance. Make sure you are familiar with your expected elevations and are familiar with your specific aircraft's performance charts.

Hazards to winter flying apply. (See SOP Chp 5) Pay particular attention to your landing areas. When landing on a ridge, make sure you are not landing on a cornice, as it may not support the weight of the helicopter. Blow out your landing area slowly, if possible, to pick up references in the snow for a safe landing. Use good deep snow technique, packing the snow with the skids and insuring the tail is well clear.

Make sure the passengers are briefed well. They should not depart or approach under the rotor without permission from the pilot.

13 General Vessel Operations

Maritime Helicopters Inc. is often called to support various boats on a short-term basis. The following is general information on helicopter/boat operations.

13.1 Task Flight Risk Assessment Profile #2 Residual Risk -LOW

The following hazards are present when conducting General Vessel operations:

a. Helideck landing in seas up to 4 feet.

b. Helicopter sliding on deck.

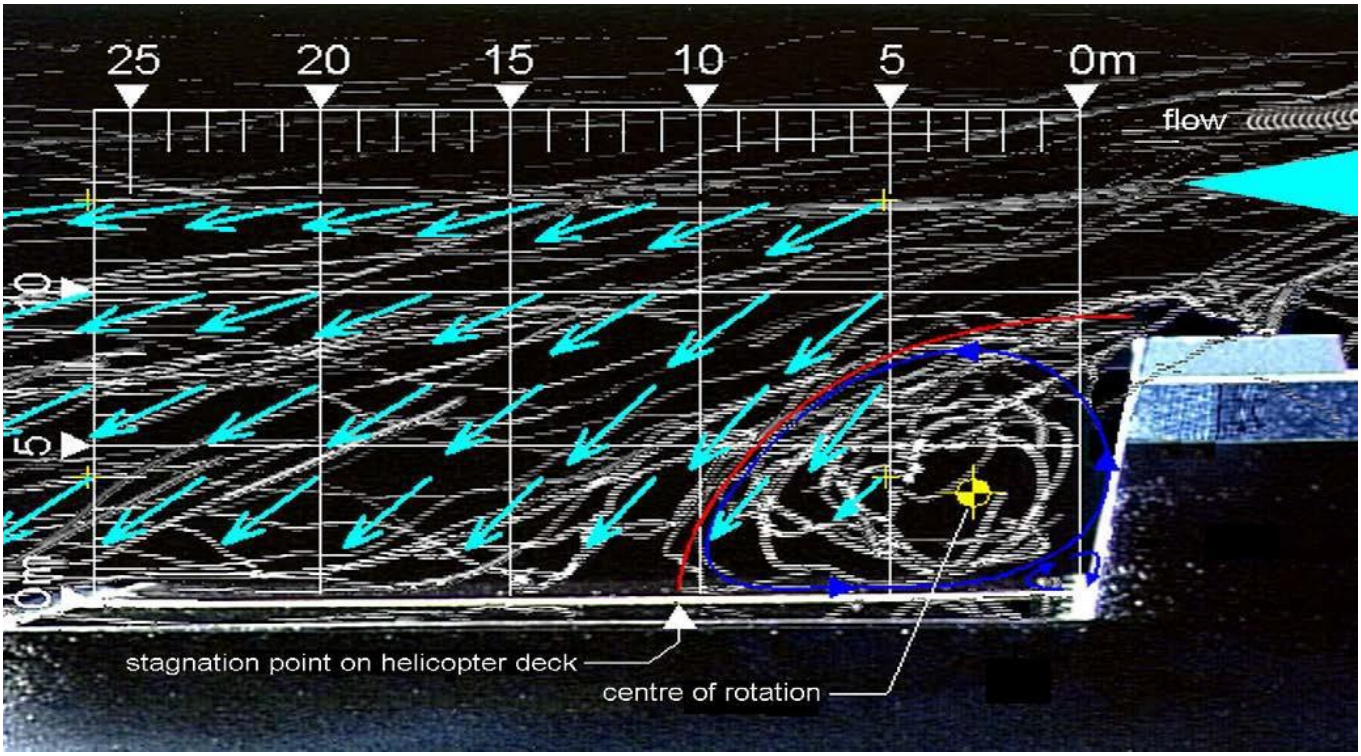
c. Loss of ground effect.

d. Attempted takeoff while attached to helideck.

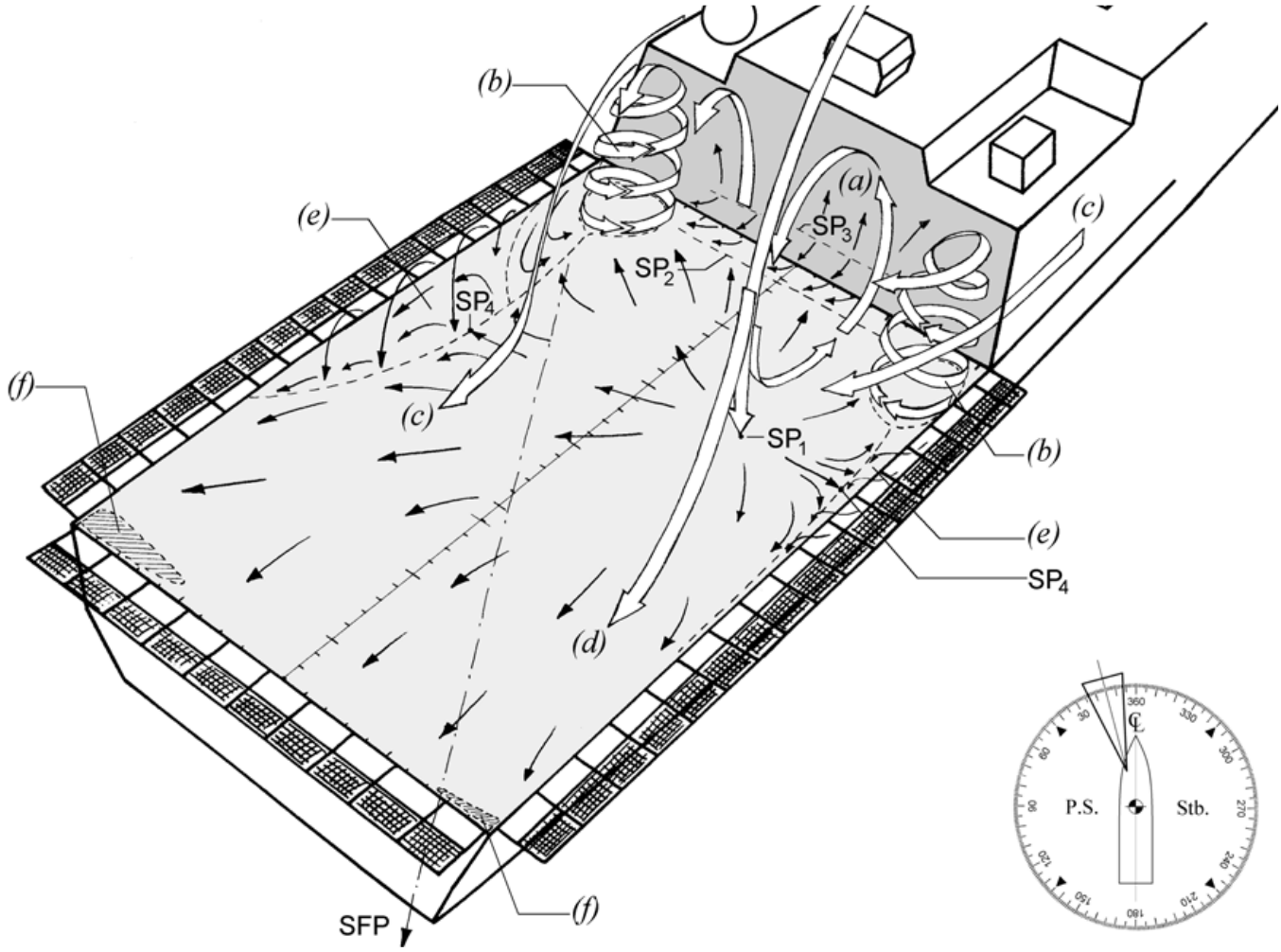
e. Inadvertent fueling of aircraft with #2 diesel fuel.Normal Procedures

13.2 Normal Procedures

The two following images show average airflow patterns over a helicopter deck located on the stern of the vessel with the airflow coming over the vessel from the bow. It is very important that the pilot is aware of the down drafts that can be encountered on short approach. They can cause a significant increase in power demands and when combined with the change in lateral airflow can cause momentary moderate turbulence even on an otherwise calm day.



Side view of airflow over the helideck



View of down drafts and vortex airflow on the helideck.

As with any operation determining wind direction and velocity is extremely important when conducting vessel operations. The following table is helpful in determining wind velocity from cues both on land and on the water.

Table of Common References for Estimating Wind Velocity

Wind (Knots)	Wind Classification	Appearance of Wind Effects	
		On the Water	On Land
Less than 1	Calm	Sea surface smooth and mirror-like	Calm, smoke rises vertically
1-3	Light Air	Scaly ripples, no foam crests	Smoke drift indicates wind direction, wind vanes are still
4-6	Light Breeze	Small wavelets, crests glassy, no breaking	Wind felt on face, leaves rustle, vanes begin to move
7-10	Gentle Breeze	Large wavelets, crests begin to break, scattered whitecaps	Leaves and small twigs constantly moving, light flags extended
11-16	Moderate Breeze	Small waves 1-4 ft. becoming longer, numerous whitecaps	Dust, leaves, and loose paper lifted; small tree branches move
17-21	Fresh Breeze	Moderate waves 4-8 ft. taking longer form, many whitecaps, some spray	Small trees in leaf begin to sway
22-27	Strong Breeze	Larger waves 8-13 ft., whitecaps common, more spray	Larger tree branches moving, whistling in wires
28-33	Near Gale	Sea heaps up, waves 13-20 ft., white foam streaks off breakers	Whole trees moving, resistance felt walking against wind
34-40	Gale	Moderately high (13-20 ft.) waves of greater length, edges of crests begin to break into spindrift, foam blown in streaks	Whole trees in motion, resistance felt walking against wind
41-47	Strong Gale	High waves (20 ft.), sea begins to roll, dense streaks of foam, spray may reduce visibility	Slight structural damage occurs, slate blows off roofs
48-55	Storm	Very high waves (20-30 ft.) with overhanging crests, sea white with densely blown foam, heavy rolling, lowered visibility	Seldom experienced on land, trees broken or uprooted, "considerable structural damage"
56-63	Violent Storm	Exceptionally high (30-45 ft.) waves, foam patches cover sea, visibility more reduced	
64+	Hurricane	Air filled with foam, waves over 45 ft., sea completely white with driving spray, visibility greatly reduced	

Once landed on the deck it is the pilots' responsibility to determine the stability of both the boat and aircraft prior to rolling the throttle to idle. In general, it is preferred that the aircraft be secured to the deck prior to rolling the engine to idle if the aircraft is to be shut down. There are many factors that the pilot must consider such as deck surface (Slippery?), vessel pitch and roll, size of the helideck, and wind direction and velocity. If tie downs are used it is the pilots' responsibility to ensure they are ALL removed prior to take off. If available a vessel crew member shall be used to confirm all tie downs are removed just prior to take off.

13.3 Communications

It is imperative that radio communications are maintained between the helicopter and vessel. Prior to beginning flight operations determine the frequency that will be used. Most vessels monitor Marine 16 (The marine emergency frequency) and can be hailed on it for initial contact.

13.4 Weather Minimums

Maritime Helicopters Inc. does not have any specific weather requirements for this type of operation.

13.5 Emergency Procedures

Pilots shall respond to any emergency as defined in the Rotorcraft Flight Manual. Time allowing pilots shall communicate their emergency on 121.5, another appropriate frequency, or with the Satellite phone installed in the aircraft.

13.6 Management Approval

Not used.

13.7 Supporting Information

Not used.

14 Maritime Maid Operations

Training Documentation

14.1 Task Flight Risk Assessment Profile #2 Residual Risk -LOW.

The following hazards are present when conducting Maritime Maid Helicopter operations:

a. Helideck landing in seas up to 4 feet.

b. Helicopter sliding on deck.

c. Loss of ground effect.

d. Attempted takeoff while attached to helideck.

e. Inadvertent fueling of aircraft with #2 diesel fuel.Training Records

14.2 Normal Procedures

Float Procedures:

Helicopters operating in conjunction with the Maritime Maid shall be equipped with fixed or emergency pop out floats. The pilot shall have the floats armed for all take offs and approaches to the Maritime Maid.

Landing when Underway:

Helideck stability is influenced by both wind and wave conditions; operations have been conducted in up to four foot seas. Landings can be accomplished straight into or up to 90 degrees off the vessel depending on winds. The “Maritime Maid” does not have enough clearance to land with the tail rotor toward the mast.

Landing on a pitching deck:

Bring helicopter to a hover into the wind and close behind vessel. Follow vessel until deck flattens out (approximately every seventh wave) and land while deck is flat. Do not attempt to chase a pitching deck. You can also ask the Captain to turn the vessel down swell.

After touch down:

Keep rotor RPM up, crewman will hook tie down strap to helicopter cargo hook and signal pilot. Determine that helicopter will not slide on deck prior to reducing rotor RPM below 100%. Be aware of potential mast bumping when reducing RPM below 100%.

Shut down:

After cool down, shut engine down and utilize rotor brake to bring blades to a stop as quickly as possible to avoid mast bumping.

Landing when at Anchor:

Boats at anchor swing with the tide, they only swing with the wind at slack tide (twice/day).

Determine wind direction and sea condition from Captain or observation of sea and surf. Ripples move downwind, white caps appear to move into the wind, lines in water parallel wind. Sea breaking against beach can indicate a swell moving under the boat.

Make approach into the wind and evaluate deck for flatness on short final, if in doubt hover till deck flattens out. Land when deck is flat. Touchdown, hook up and shutdown as described for vessel underway.

Refueling:

The “Maritime Maid” centrifuges all jet and vessel fuel which removes all water and particulates. Jet fuel is run through a complete jet fuel filter system which particulate separation and go/no go protection for water. The Maritime Maid uses any combination of four internal tanks for jet fuel. These tanks can be used for either jet or vessel fuel. When jet fuel is in a tank it is tagged with a yellow “Jet A” tag. This tag will be on all valves that can affect this transfer. The vessel runs on #2 diesel. Our jet fuel is in effect #1 diesel. Jet fuel is clear. #2 diesel is pink (from the oil content). A sample will be taken daily from the jet fuel nozzle to check for type and clarity.

Hot fueling will be allowed as long as no passengers are aboard helicopter or it is unsafe to unload passengers. (N/A for US Forest Service work.)

Grounding is not required with skid-equipped helicopters. Grounding is required for helicopters equipped with fixed floats.

Tie Down:

At anchor or traveling in smooth seas and light winds, cargo hook tie down is adequate.

With wind conditions over 20K, or sea conditions over one foot, Bell 206 helicopters will be secured through the deck by straps to two forward hard points and the cargo hook, with straps athwart ship to the rear hard point. Additionally tie down collar will be placed on the Bell 206 mast and strapped to deck 45 degrees forward and aft. Blades will be secured on both ends forward and aft.

The Bell 407 is to be tied down as described above except no collar is necessary on the mast.

Plugs and covers will be installed for all tie down situations.

Takeoff:

Particular care should be taken to remain within weight and balance limits. Ground effect is noticeable to a height of one rotor diameter even on small helicopter decks. It is immediately lost as you move off the deck to the side. Particular attention should be paid to wind direction and velocity. Tide and current can cause the vessel to swing creating a tail wind. It may be necessary to reposition the helicopter on the deck while empty so that a loaded departure can be made into the wind.

IMPORTANT: Remove all skid tie downs prior to start. Release cargo hook at 100% NR just prior to pulling pitch.

If aircraft is heavy, a good technique is to climb over the heli-deck until ground effect is no longer noticeable; this gives the aircraft room to fall when leaving ground effect.

Another technique is to have vessel proceed at full speed (approximately 10KT) into the wind to generate maximum lift prior to lift off.

Hazards:

The most common cause of accidents in vessel/helicopter operations has been attempted take offs with the helicopter partially secured to the deck. Pilot must be certain all tie down straps are removed prior to lift off. A vessel crewmember shall be used to give the pilot a final OK prior to departure. A thumbs-up from the vessel crewmember will confirm release.

14.3 Communications

It is essential that good communications are available between the pilot and captain. Radio communication shall be checked prior to flight operations. Any potential hazards observed on the boat shall be communicated to the pilot prior to final approach.

14.4 Weather Minimums

Landings on the Maritime Maid will not be attempted in seas over 4 feet.

14.5 Emergency Procedures

Pilots shall respond to any emergency as defined in the Rotorcraft Flight Manual. Time allowing pilots shall communicate their emergency on 121.5, another appropriate frequency, or with the Satellite phone installed in the aircraft.

Should an emergency situation arise on the Maritime Maid it is the responsibility of the pilot to determine if the helicopter should be removed from the boat as a precautionary measure.

14.6 Management Approval

Not used.

14.7 Supporting Information

See Chapter 11: General Vessel Operations.

15 Coast Guard Cutter Operations

The Coast Guard Cutter HEALY is United States' newest and most technologically advanced polar icebreaker. The HEALY is designed to conduct a wide range of research activities, providing more than 4,200 square feet of scientific laboratory space, numerous electronic sensor systems, oceanographic winches, and accommodations for up to 50 scientists. The HEALY is designed to break 4 feet of ice continuously at three knots and can operate in temperatures as low as -50 degrees F.

As a Coast Guard cutter, the HEALY is also a capable platform for supporting other potential missions in the polar regions, including logistics, search and rescue, ship escort, environmental protection, and enforcement of laws and treaties.

It is 420 feet long with an 82-foot beam. The heli-deck is designed to support a 22,000 lb. JayHawk helicopter with a 54-foot rotor diameter. The vessel has an NDB on board that may be a useful aid to navigation. The frequency is 410.

The aviation facilities aboard Healy include a flight deck, hangar complex, and a Helicopter Control Station. The flight deck is certified for both day and night operations and is capable of handling vertical replenishment (VERTREP) aka sling load operations. The Helicopter Control Station is just above the hangar. This is where the Helicopter Control Officer (HCO) controls all aspects of the helicopter operations and sets the flight condition level. At the HCO’s control is an AFFF Fire Fighting System, deck and emergency wave-off lighting, a video system that records all takeoffs and landings and both FM and VHF radios.

15.1 Task Flight Risk Assessment Profile #3 Residual Risk -LOW

The following hazards are present when conducting Coast Guard Cutter Healy operations:

a. Landing on helideck in rough seas.

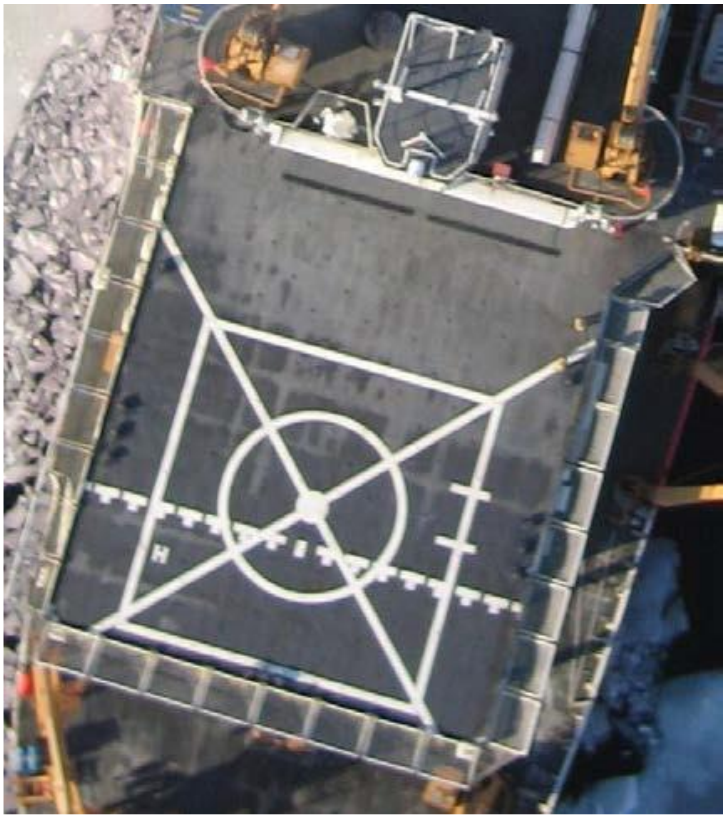
b. Turbulence during landing or takeoff.

c. Helicopter sliding on helideck.

d. Loss of ground effect.

e. Attempted takeoff while attached to the helideck.

15.2 Normal Procedures



- The “H” in the lower left hand corner is used for aerial refueling of helicopters. This is not applicable to Maritime Helicopter Inc operations. Hot refueling is not available either.
- During VERTREP sling nets are placed aft of the “T” line.
- The large “X” is a guide for landing on the oblique. Landing on a 45° angle to the boat.
- The two lines on the right side of the box are used as a guide for landing athwart ships.
- Landing on a 90° angle to the boat.
- The circle is the touchdown pad.

On the flight deck Coast Guard personnel perform several duties, each of which have a specific uniform color.

Yellow: Landing Signal Officer Purple: Fuel Handlers

Green: Safety

Blue: Tie downs/traversing detail White: Medical

Red: Crash Rescue

The flight deck light signals are as follows:

- Red Deck: The helicopter is not permitted to land or take off. The ship is permitted to maneuver.
- Amber Deck: The helicopter is starting/shutting down. The ship has to maintain course.
- Only the LSO is permitted on deck.
- Green Deck: The helicopter is cleared land/takeoff. The ship has to maintain course. Only the LSO is permitted on deck.
- Flashing Red Lights: Do not land.

Prior to takeoff or landing the HCO in the Helicopter Control Station provides the pilot with ships current information referred to as the “numbers”. The “numbers” consist of the following information:

- Ship course and speed (Degrees Magnetic and Knots)
- Ship Motion (Pitch and Roll)
- Ship Altimeter Setting
- Ship Relative Speed
- Ship True Wind

Upon departure radio communications are passed from the HCO to the bridge. The pilot states POB (Persons on Board) and the duration of fuel on board. The pilot is required to check in every 15 minutes and state longitude, latitude and fuel duration on board. Before landing on the ice, the pilot must establish good communications and state location and intentions. Once landed, no further check- ins are required until takeoff.

15.3 Communications

Communication can be obtained on the FM, VHF or satellite phone.

- Primary: VHF-FM 157.175 TX/RX
- Secondary: VHF-AM 123.05
- Satellite Phone on Healy: 88-167-631-9440

NOTE: Check for changes before operations begin.

15.4 Weather Minimums

The weather and operation limitations for Healy operations are as follows:

- Onshore: 300 ft ceiling and 2 miles visibility
- Offshore: 500 ft ceiling and 2 miles visibility
- Wind limitation is 25 kts
- Ship motion limits: 2° pitch and 4° roll
- Minimum Ice Thickness for landing: 16 inches
- Operate within a 50-mile radius of an acceptable landing surface (Ship, platform, land or pack ice)

15.5 Emergency Procedures

Pilots shall respond to any emergency as defined in the Rotorcraft Flight Manual. Time allowing pilots shall communicate their emergency on 121.5, another appropriate frequency, or with the Satellite phone installed in the aircraft.

15.6 Management Approval

Not Used

15.7 Supporting Information

See Chapter 13: General Vessel Operations.

16 Matson Lines Vessel Operations

The objective of this operation is to deliver a marine harbor pilot to one of the Matson Lines vessels, landing on the helideck. The vessels are 700 feet long with a 50-foot beam. During the winter months (Oct-May) the helicopter is normally flown from the Kenai Airport. By contract, two pilots will fly this mission during the winter months.

The following vessels are used by Matson Lines:

Matson Anchorage, Sat Phone 254-378-1293, Cell 253-905-8341, Captain Anacker or Cooper
Matson Tacoma, Sat Phone 254-377-7688, Cell 253-905-8342, Captain Ramsey or Sunkel
Matson Kodiak, Sat Phone 254-378-0641, Cell 253-905-8343, Captain Moran or Engberg (Matson Consumer, No Marine Pilot transfer when used due to no helideck.)

16.1 Task Flight Risk Assessment Profile #1 Residual Risk –LOW Day – MODERATE NIGHT

The PIC will obtain an ETA for the vessel at approximately 10:30 a.m. the morning before the flight. Contact the Matson office in Anchorage for this information at 907-263-5060. Have a current Outlook Briefing from the FSS. (See Fog/Inclement Weather Procedure below) A vessel ETA update may be obtained at 2:30 p.m. from the Horizon Anchorage office.

Normally the pilot(s) will begin the helicopter preflight one hour prior to rendezvous with the ship. The aircraft is normally rolled out of the hangar 15 minutes prior to the rendezvous time with the vessel.

If visibility does not permit visual contact with the boat upon reaching the coastline inbound to the vessel, track the coastline northbound to rendezvous at the “south docks” when the vessel is at its closest point (1/2 NM) off shore. Refer to Figure 2. Radar Altimeter bug will be set to 200 feet.

Night flights require two pilots to conduct an aircrew briefing before flight. This will include PIC’s intentions in the event of an inadvertent IMC encounter and crew coordination expectations.

Refer to Figure 1 for information regarding the approach to the vessel. Note the profile and overhead views and “windows” for a safe approach to the vessel. Refer to Figure 2 for vessel track information. Normally the helicopter is turning final as the vessel is completing “The Turn.” (Figure 2)

Fog/Inclement Weather Contingency Plan: This SOP prevents negative impacts on the 0700 arrivals into Anchorage due to weather delays or cancellations.

1. The captain will include a drop dead divert time into Homer on the daily ETA messages.
2. At both 7.5 and 4.5 hours prior to the vessel's ETA at the Kenai/Niniski pilot boarding area the Maritime Helicopters Inc pilot shall contact the Kenai FSS to obtain current and forcast conditions for the Kenai area. The pilot shall contact the SWAPA Dispatcher to share the forecast. If fog or inclement weather are forecast for the time of the Kenai helicopter boarding the SWAPA dispatcher will contact Paul Shadura or Anchorage Marine. In addition, Anchorage Marine will contact the Maritime Helicopters Inc. pilot one hour prior to the drop dead divert time for a weather update.
3. Maritime Helicopters PIC will call the vessel Captain approximately 1 hour prior to the scheduled landing to confirm ETA and obtain weather/wind information.
4. If at any time the Maritime Helicopters Inc. pilot, vessel Captain or SWAPA dispatcher believes a delay in helicopter boarding may occur a call shall be made to Paul Shadura or

Anchorage Marine to discuss the concern and possible options to avoid the delay. If the decision is made to divert the vessel to Homer the SWAPA dispatcher will advise the vessel pilot and make the necessary arrangementsTraining Forms

16.2 Communications

Communication with the vessel must be clear and concise. The vessel will be monitoring Marine Channel 10 (FM). An example of the required FM calls to the vessel are:

- "Matson Tacoma, Helo 307MH, airborne, vessel in sight, ETA 5 minutes" (inbound – right after takeoff)
- "Matson Tacoma, Helo 307MH, On Final" (inbound – base to final turn)
- "Matson Tacoma, Helo 307MH, departing deck, starboard side" (Takeoff from vessel)
- "Matson Tacoma, Helo 307MH, Over Shoreline" (outbound – crossing shoreline)

When two Maritime Pilots are used at night, standard intercom calls are expected within the cockpit. Examples of calls: (PF - pilot flying, PNF - pilot not flying)

- PF - Altitude leaving for new altitude – "One thousand descending to five hundred." PF - On final and beginning descent to vessel – "On the approach."
- PNF – When below desired altitude – "Check altitude, descending, xxx feet."
- PNF – During final approach every 100' increment – "Altitude, airspeed, sink rate" PNF – At 300'AWL/60K – "Floats Armed"
- PNF – On deck before passenger disembarks – "Floats Disarmed" PF – Before liftoff from helideck – "Coming Up for Takeoff" PNF – On deck before takeoff – "Floats Armed"
- PNF – After takeoff above 300' AWL/60K "Floats Disarmed"

Contact Numbers:

- Matson Lines Anchorage: SAT 254-378-1293 / 011-872-764- 589- 416
- Matson Lines Tacoma: SAT 254-377-7688 / 011-870-764- 589- 423
- Matson Lines Kodiak: SAT 254-378-0641 / 011-872-764- 575- 215
- T. DAVENPORT 440-9242
- L. GALLOWAY 830-2736
- Matson Lines Anchorage CP 253-905-8341 Horizon Lines Tacoma CP 253-905-8342 Matson Lines Kodiak CP 253-905-8343 Marine: 263-5060
- SWAPA Dispatch: 235-8783 Maritime Helicopters Pilots:
  - Dave Buzga 208-596-9076
  - Dave Jones 907-388-8390
  - Bob Fell 227-7602

16.3 Weather Minimums

Day: 300' ceiling and 1 mile visibility. Night: 500' ceiling and 3 NM visibility. NVG: 1000' ceiling and 3 NM visibility.

Emergency Procedures

Pilots shall respond to any emergency as defined in the Rotorcraft Flight Manual. Time allowing pilots shall communicate their emergency on 121.5, another appropriate frequency, or with the Satellite phone installed in the aircraft.

The pilot will have ENA Instrument Approach Plate immediately available in the event of an inadvertent IMC encounter. If all visual references are lost, maintain aircraft control and initiate

a positive climb. Above 500’ AWL turn to a heading of 180 degrees and continue climbing to 2000’ MSL. Declare an Emergency and state your intentions.

The pilot also has the option of staying on the boat if conditions do not allow for a safe return to Kenai after landing on the vessel.

In the event of an engine failure over the water: maintain aircraft control, enter autorotation, slow to 60K, inflate pop-out floats, landing lights on, flare and cushion landing on water. Make “Mayday” radio call to Horizon Vessel/ATC if time permits.

16.4 Management Approval

Tier 1 approval is required when this operation is conducted at night.

16.5 Supporting Information

See Figures on following pages.

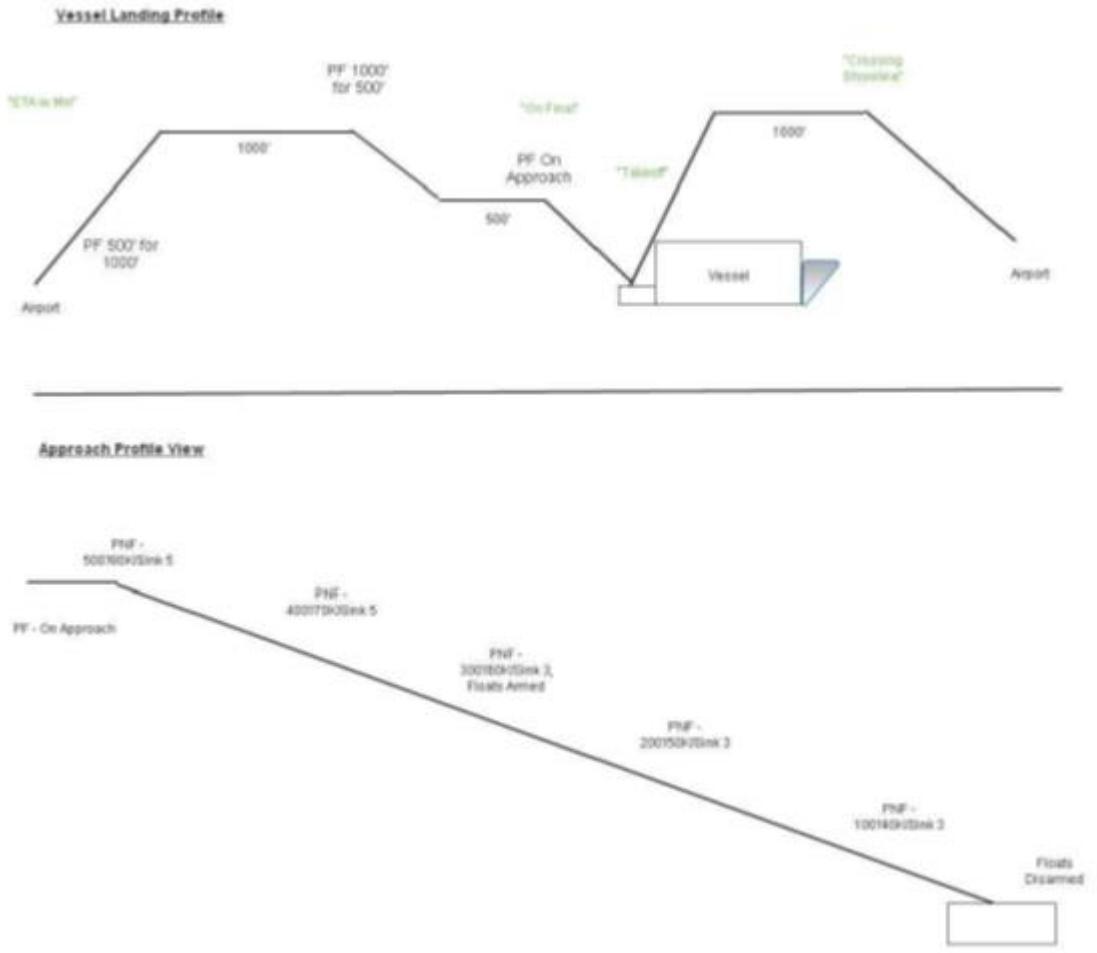


Figure 1: Matson Lines Vessel Flight Profile Views

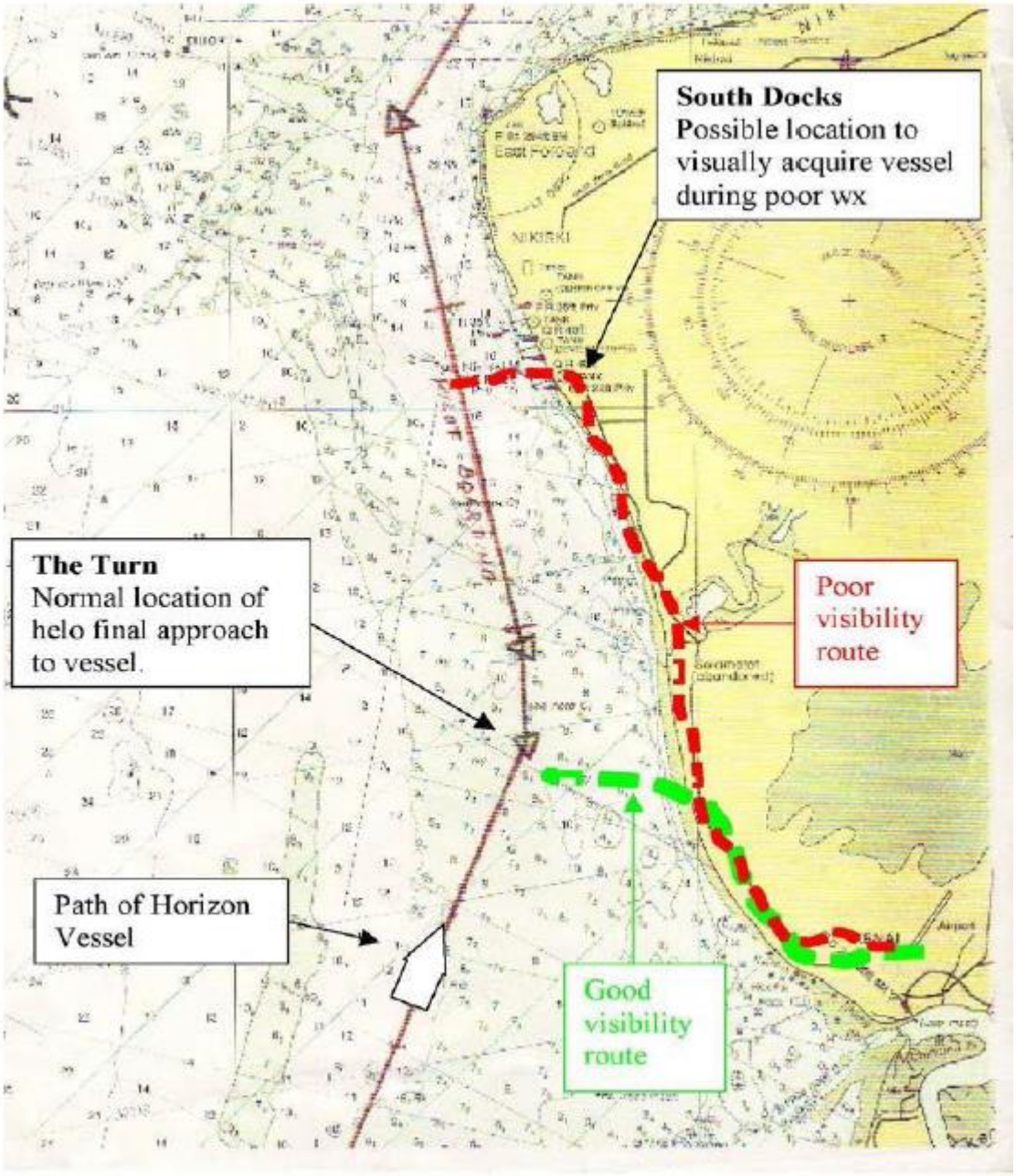
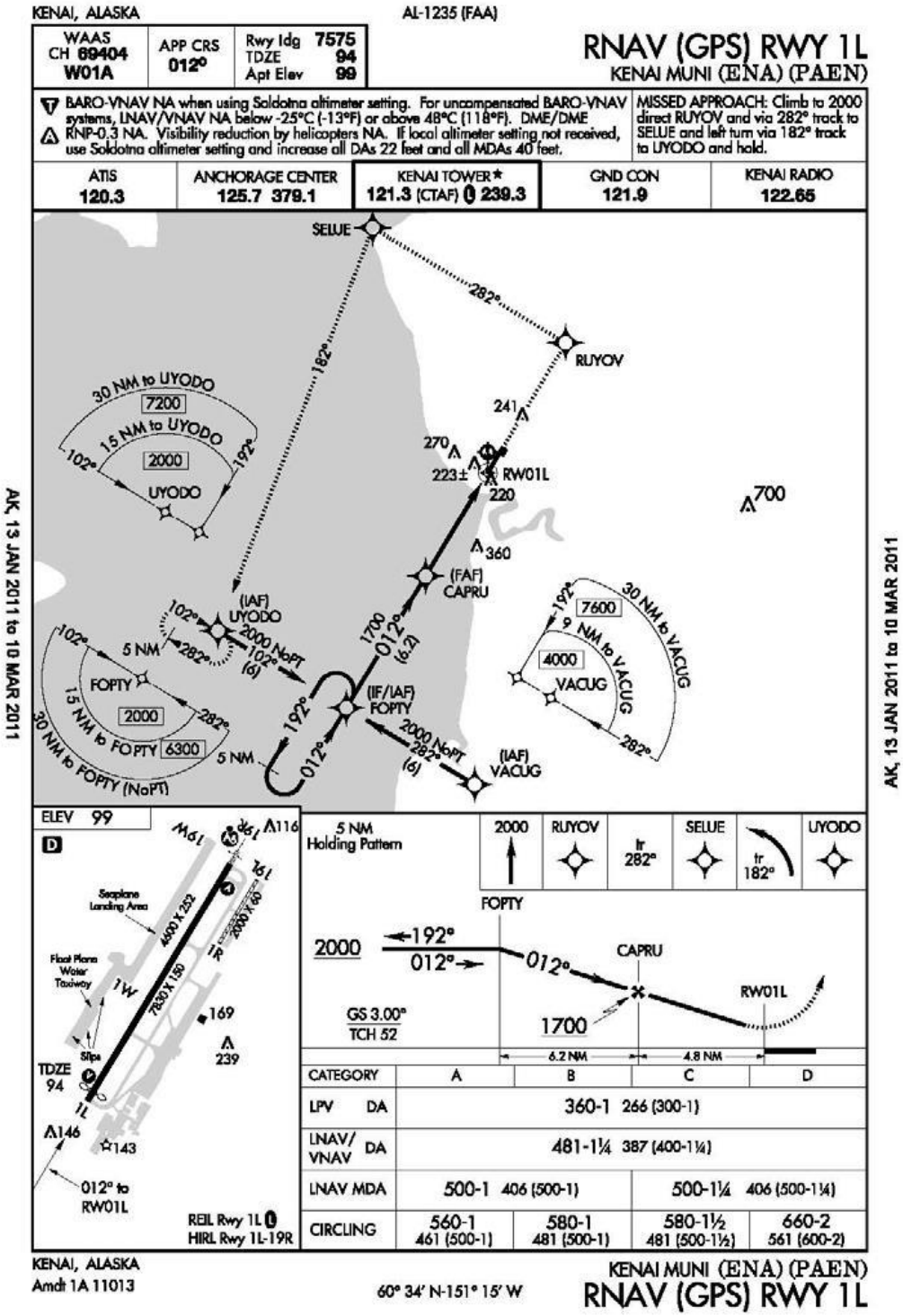


Figure 2: Matson Lines Vessel Track during pilot loading



Instrument Approach Plate for Kenai's Runway 1L-VFR reference only.

17 Seismic Operations

Seismic flying…with underslung loads requires special precautions to be taken if both the helicopter crew and third parties are to be protected from undue risk. This publication contains advice on various aspects of external load operations. A full and comprehensive briefing should be carried out with all staff involved in the operation.

17.1 Task Flight Risk Assessment Profile #5 Residual Risk -LOW

The following hazards are present when conducting vertical reference operations:

a. Blowing debris during landing/takeoff.
b. Inadequate rigging.
c. Inadequately trained personnel.
d. Snagged cable on ground.
e. Reduced aircraft performance.
f. Settling with power.
g. Inadvertent release of cargo.
h. Empty cable contacts tail rotor during flight.
i. Downdrafts/Gusty winds.
j. Failure of lifting equipment.
k. Fuel exhaustion.
l. In-flight loss of control of the load.
m. Engine failure while operating within the height/velocity diagram.
n. External load operation.
o. Uncontrolled personnel in the helicopter landing area.

17.2 Normal Procedures

The following procedures will be followed by Maritime Helicopters Inc. pilots during vertical reference operations unless following them presents a safety concern for the specific operation being conducted. Due to the dynamic nature of vertical reference operation's, it is essential the pilot takes all variables into consideration.

Pre-Flight and Pre-Flight Briefing:

Both electric and manual releases will be checked before external load operations are conducted. Operations will be suspended if either release in not operating. The electric release on the remote hook shall also be checked if used.

Prior to any external load operations all Maritime Helicopters pilots shall ensure that all ground crew personnel are briefed on the following items in addition to the standard passenger briefing:

1. Hand signals to be used. This should be briefed even if radio communications are available between the pilot and ground crew in case of radio problems.
2. The order in which loads will be taken. Generally lighter loads are picked first and heavier loads are picked after fuel is burned off.

3. The maximum weight the pilot is comfortable picking.
4. Emergency procedures to include the direction ground crew should move in case of an engine failure.
5. How the loads will be rigged especially if a drag chute or fin is to be used to prevent the load from spinning.

Equipment:

1. All equipment shall be inspected prior to use. Pay special attention to the condition of slings and nets to ensure sewed connections are secure and no fraying is present.
2. All hooks used will have an operational spring gate.
3. A swiveling hook will be used to prevent lines from being twisted in flight.
4. Only metal rings will be attached to the hook on the aircraft. This is to prevent any sling or rope from twisting itself on the hook thereby preventing it from being released be the pilot.
4. Pilots will land in such a way to avoid landing on the line.
5. The length of line used will be at the discretion of the pilot and should allow for obstacle clearance in all areas of operation.

Other Requirements:

In some cases it is necessary for the pilot to exit the aircraft with it running to hook or unhook a load or adjust the rigging of a load. Extreme caution shall be used in these cases. Prior to exiting the aircraft the pilot will roll the throttle down to idle, tighten all control frictions, and select the hydraulic system to the off position. Time out of the aircraft shall be kept to a minimum. Pilots will ensure the hydraulic system is restored, the frictions are adjusted, and the throttle is set prior to continuing operations.

Pilots taking off unaware that the long line is still hooked to the belly has caused many accidents. To prevent this, if the aircraft is shutdown the pilot shall release the line from the belly of the aircraft.

When flying with an empty cable attached, the aircraft will be operated at an airspeed not to exceed 80 kts.

17.3 Communications

The use of radio communications between the pilot and ground crew is the preferred method of communication. If radio communications are not available hand signals shall be used. It is important that the ground crew is properly briefed on the hand signals to be used.

17.4 Weather Minimums

Wind: Any operations conducted in more than 25 Kts. or with a gust spread of more than 15 Kts. requires Tier 1 approval.

Weather: A ceiling that allows for 300’ of clearance between the load and terrain with 1 mile of visibility.

17.5 Emergency Procedures

Pilots shall respond to any emergency as defined in the Rotorcraft Flight Manual. Time allowing pilots shall communicate their emergency on 121.5, another appropriate frequency, or with the Satellite phone installed in the aircraft.

Engine failure during a hover while hooking up sling load, release cargo and move to the side of the load that the ground crew have been briefed to remain clear of while performing hovering autorotation.

Engine failure during takeoff, release cargo and turn slightly to either side of the take off track if possible to avoid load skipping into helicopter while performing hovering autorotation.

Engine failure during flight; enter autorotation, then if altitude permits determine if the area below the helicopter is suitable to jettison the cargo without damage to persons or property on the surface. If possible release sling load and change heading before completing autorotation.

In the case of a cargo hook release malfunction check to see if the circuit breaker is in, if so use manual release. Discontinue sling load operations until problem is corrected.

17.6 Management Approval

Tier 1 approval is required when operations are conducted in more than 25 Kts. or with a gust spread of more than 15 Kts..

17.7 Supporting Information

Maritime Helicopters Inc. External Load Powerpoint.

18 Class B Human External Cargo (HEC) Operations

Class B Human External Cargo (HEC) operations are utilized to carry a person or persons suspended beneath a helicopter with a long line. The person or persons being carried must be a crewmember, a person essential to the external-load operation, or a person who is necessary to accomplish the work activity directly associated with that operation. The following situations are approved Class B HEC operations:

a. Power line patrol/maintenance personnel.

b. Rescue personnel who are performing emergency medical and rescue services.

18.1 Task Flight Risk Assessment Profile #15 Residual Risk -LOW

The following hazards are present when conducting HEC operations:

1. Unknown responsibilities
2. Improper Rigging
3. Inadvertent Release of HEC
4. Environmental Hazards to HEC crew
5. Aircraft emergency procedures involving loss of control/engine failure
6. Excessive descent rate while setting HEC on the ground
7. Excessive spinning of HEC load

18.2 Training

All personnel involved in the class B HEC operation will receive training. Training will be conducted annually. HEC crew must have recency of experience within five months preceding the month of conducting class B HEC operations. All pilots will have recency of experience within two months preceding the month of conducting Class B HEC operations.

Pilot Training

Pilot training will be conducted by the chief pilot or the chief pilot's qualified designee. Training will be documented in the pilot's records. Ground training will include the following:

a. Application of Class B HEC
    1. Uses of Class B HEC
    2. Pilot and Crewmember qualifications
    3. Aircraft and equipment approved for use
b. Hazard Identification
    1. Class B HEC risk assessment and mitigations
    2. External load operations risk assessment and mitigations
    3. Powerline/Utility risk assessment and mitigations
c. Aircraft and HEC System
    1. Hook configurations and limitations
    2. Installation and removal of secondary hook
    3. Flight manual supplement
    4. Preflight inspection
    5. Cockpit familiarization and switch locations

6. Equipment log
7. Weight and balance
8. Aircraft performance and engine trend monitoring
9. Fuel Management

d. Using the approved lifting device and long line
    1. Description of body harness
    2. Body harness preflight and rejection criteria
    3. Rigging the equipment
    4. Description of BoostEr Aerial Platform Bag
    5. BoostER Aerial Platform Bag preflight and rejection criteria
    6. Rigging the BoostER Aerial Platform Bag
    7. Configuring the helicopter for litter kit patient transport
    8. Equipment logging requirements
e. CRM and Crew Coordination Procedures
    1. Normal operating communications
    2. Emergency and abnormal operating procedures
    3. Safety hover check procedures
    4. Area reconnaissance procedures
    5. Approved head and hand signals
    6. Lost communication procedures
f. Normal and abnormal procedures
    1. Review of RLCFM
    2. Review of pertinent SOPs
g. Pilot duties and Responsibilities
    1. Safety Briefing
    2. Normal operational duties
    3. Abnormal/ emergency procedure operational duties
        A. Aircraft emergency procedures
        B. Injury or incident on ground
h. Safety Briefing Procedures
    1. Project goals and expected workflow
    2. Load weights/ performance factors
    3. Refueling plan
    4. PIC responsibilities at the job site
    5. Crewmember responsibilities at the job site
    6. Job site safety briefing
    7. Landing zone and HEC cargo drop location
    8. Communication Plan
    9. Emergency procedures
    10. Weather and environmental hazards
    11. PPE
    12. Universal “Go/No-Go” authority
i. Class B HEC Procedures
    1. Personal Protective Gear
        A. Helmet
        B. Hearing protection
        C. Eye protection
        D. Long sleeves
        E. Gloves
        F. Pants
        G. Boots that support the ankle

2. Safeties
3. Tools and other loose objects
4. Landing zone considerations
5. Speed restrictions
6. Time limitations
7. Temperature limitations
8. Other environmental considerations

Pilot flight training will include the knowledge and skills for the tasks and subjects listed below. Before a pilot is approved to fly Class B HEC they must pass the skills demonstration and be approved by the Chief Pilot or the Chief Pilot's designee.

a. Pre-flight
    1. Aircraft pre-flight
        A. Aircraft pre-flight
        B. HEC system preflight
    2. HEC equipment inspection
        A. Rope and rigging inspection
        B. Body harness inspection
        C. BoostER Aerial Platform Bag (if required)
    3. Performance planning
    4. Weight and balance
    5. Crew briefing
b. Arrival to HEC work location
    1. Propper reconnaissance of area
    2. Selects appropriate operational locations
    3. Line is in control arriving to HEC crew
c. Attaching the load
    1. Communication and signals with the crew
    2. Crew hook up the load
    3. Crew signals read
d. Executing Takeoffs to a hover
    1. Lift crewmembers to a hover
    2. Crewmember signals "ready" or "lower"
    3. Maintains proper control and vertical reference
    4. Preventing inadvertent release of the load
e. Transition to forward flight
    1. Crew signals
    2. Preventing inadvertent release of the load
    3. Transitioning from vertical reference
    4. Speed limitations
f. Setting the load
    1. Transitioning to vertical reference
    2. Crew signals
    3. Setting crew and allowing adequate time for HEC crew to establish footing
    4. Crew unhooks
    5. Crew releases the line
    6. Preventing inadvertent release of the load

g. Emergency Operations
    1. Loss of tail rotor effectiveness
    2. Settling with power
    3. Emergency release of the load
    4. Preventing inadvertent release of the load

Pilot Evaluation

Before being approved to fly Class B HEC, the pilot must pass the skills demonstration. The skills demonstration will consist of three phases. All three phases must be successfully demonstrated for a pilot to be approved. The objective is to determine that the pilot:

a. Exhibits knowledge by explaining the elements of HEC operations
b. Performs a thorough preflight briefing of personnel to include hookup procedures, hand signals, and pilot and other personnel actions in the event of an emergency.
c. Visually determines that the personnel attach system(s) is attached properly and is functional.

Phase 1: Precision longline: The inspector will (1) observe and evaluate the pilot's skills and ability for vertical reference flight, (2) observe the pilot's control of the helicopter as well as the load, and (3) observe the pilot's response to variable weather conditions that may be present. With a nonhuman load (6 to 8 feet long, 150 to 200 pounds and the helicopter rigged so the load is suspended as it would be during normal class B HEC operations, the pilot must:

a. Ascend vertically using vertical reference techniques while centered over the load until the load clears the ground, then fly a normal pattern or specified route to the designated location.
b. Arrive at the designated location and place the load within the 10-foot diameter circle not touching the ground and not more than 6 feet from the ground.
c. Keep the load stabilized in the circle without touching the ground or exceeding a load height of 6 feet for 2 out of 3 minutes. Note: Contacting the ground causing the load to tilt or contacting to ground intentionally to stop the load from swinging is a failure of this task phase.

Phase 2: Load control and placement: With a nonhuman load (6 to 8 feet long, 150 to 200 pounds and the helicopter rigged so the load is suspended as it would be during normal Class B HEC operations, the pilot must:

a. Ascend vertically using vertical reference techniques while centered over the load until the load clears the ground.
b. Demonstrate load control and placement by flying the load through a predetermined ground course. This will be a square course with four (4) circles (3 feet in diameter) at each of the corners. The pilot will maneuver the load at an altitude not to exceed 6 feet above the surface without touching the ground except at the targets. The pilot will maneuver the load in line with each side of the course and place the load on the ground inside each of the circles. All load placements must be done in a manner that demonstrates that the pilot has complete control of the load and the vertical rate of descent at touchdown. This course is not timed.

    Note: Contacting the ground other than at the designated locations, tilting the load when placed in the circle, or contacting the ground to stop the load from swinging is a failure of this task phase.

Phase 3. Class B HEC: Upon successful completion of the above three phases, the pilot will demonstrate the ability to work with a human on the end of the HEC line. The pilot will:

Note: "Human" is a fully qualified crewmember person.

a. Demonstrate the ability to place a human at a predetermined target with the same tolerance as outlined in Phase 2.
b. Demonstrate total control of the load at all times.

The inspector will:

a. Phase 1 - Observe and evaluate the pilot's skills and ability for vertical reference flight. Observe the pilot's control of the helicopter as well as the load. Observe the pilot's response to variable weather conditions that may be present.
b. Phase 2 - Observe and evaluate the pilot's ability to control, maneuver, and precisely place loads on predetermined spots. Observe the pilot's reactions to existing weather conditions and their effects on the ability of the pilot to maintain control and maneuver the helicopter and load.
c. Phase 3 - Observe the pilot during a Class B HEC operation. Evaluate the pilot's control of the aircraft and the load during the operation. Observe the pilots interaction with the crewmember.

Crewmember Training

a. Using the approved lifting device and long line
    1. Description of body harness
    2. Body harness preflight and rejection criteria
    3. Rigging the equipment
    4. Description of BoostEr Aerial Platform Bag
    5. BoostER Aerial Platform Bag preflight and rejection criteria
    6. Rigging the BoostER Aerial Platform Bag
    7. Configuring the helicopter for litter kit patient transport
b. CRM and Crew Coordination Procedures
    1. Normal operating communications
    2. Emergency and abnormal operating procedures
    3. Safety hover check procedures
    4. Area reconnaissance procedures
    5. Approved head and hand signals
    6. Lost communication procedures
c. Normal and abnormal procedures
    1. Review of RLCFM
    2. Review of pertinent SOPs
d. HEC crew duties and Responsibilities
    1. Normal operational duties
    2. Abnormal/ emergency procedure operational duties
        A. Aircraft emergency procedures
        B. Injury or incident on ground
e. Safety Briefing Procedures

Project goals and expected workflow

1. Load weights, performance factors, and refuel plan
2. Pilot and crewmembers' responsibilities
3. Communication plan
4. Landing zone/ HEC drop zone hazards
5. PPE
6. Emergency procedures and plans
7. Go/ NO GO authority

f. Class B HEC Procedures
   1. Personal Protective Gear
      A. Helmet
      B. Hearing protection
      C. Eye protection
      D. Long sleeves and pants
      E. Gloves
      F. Boots
   2. Safeties
   3. Tools and other loose objects
   4. Landing zone considerations
   5. Speed restrictions
   6. Time limitations
   7. Temperature limitations
   8. Other environmental considerations

Recency of Experience

Before conducting Class B HEC operations, the pilot and crewmember must have met recency of experience. Pilots must have accomplished a minimum of three precision long-line placements with in two months preceding the month of Class B HEC operations. Class B HEC loads are preferred to maintain proficiency, however non HEC precision placements and operations with a long line will be allowed to meet the recency of experience if it was conducted within company operations on similar line length

Before participating in Class B HEC operations, HEC crew must, within the preceding five months preceding the month of the Class B HEC operation, have performed or demonstrated proper HEC rigging to include attachment to the line, donning the personal lifting device, and a buddy-check inspection.

18.3 Personal Protective Equipment (PPE).

Required PPE

During Class B HEC operations, the HEC crew are required to wear the following PPE. There may be some situations that require exceptions to the PPE requirements. Affected personnel should bring up any PPE deviation during the job site safety briefing. A risk analysis should be conducted by the

pilot and crew in the briefing to determine if a deviation will increase safety and identify protentional hazards to mitigate. Deviations can only be made to increase safety of personnel.

a. Helmet

HEC crew must have an approved aviator's helmet, hard hat with chin strap, or a climbing helmet with chin strap.

b. Eyewear

HEC crew must wear safety glasses or tight-fitting goggles that completely cover the eyes, eye sockets and facial area immediately surrounding the eyes and provide protection from impact, dust and debris, and wind.

c. Hearing Protection

HEC crew should wear hearing as appropriate while working undeath the helicopter. Special consideration should be given that hearing protection remains in place during HEC operations.

d. Long Sleeves and Pants

HEC crew must wear long sleeves and full-length pants that are appropriate for the meteorological and landing zone conditions and over protection from blowing dust/snow and small debris. The long sleeves should overlap the gloves and the full-length pants should overlap the boots.

e. Gloves

HEC crew must wear gloves such as leather, nomex, or canvas gloves that provide protection against cuts and burns.

f. Boots

HEC crew must wear boots that support the ankle and are appropriate for mission safety and the work to be performed.

18.4 HEC Equipment

Note: The HEC system is designed to prevent catastrophic loss of the HEC load and potentially the HEC. Redundancy is a key safety feature and should be used throughout the entire HEC system to the extent practical.

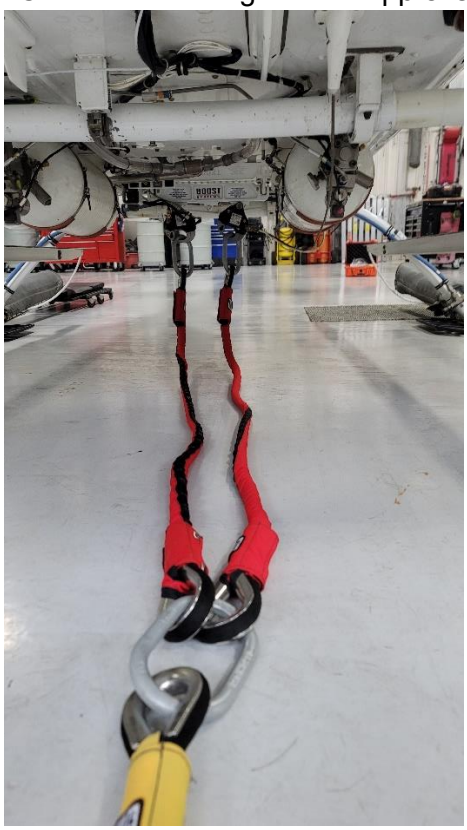
All equipment used must be approved for HEC operations. All equipment will be tracked, logged, and maintained in accordance with manufacturer requirements and applicable regulations.

a. HEC Rope Attachment Point

The Boost HEC System will be used to attach the HEC long line to the helicopter. The system includes both a primary and a secondary back up hook. The primary and the secondary hook are designed for pilot release in the event of an emergency. The load is fully jettisonable, utilizing two separate and independent actions. The system should be inspected with the daily preflight before use in accordance with the BOOST ICAs.

b. HEC Long Line

The Boost HEC System long line is used to suspend the HEC below the helicopter during HEC operations. It utilizes a “Y” line to attach the long line to the two independent HEC attachment points on the helicopter. The Boost HEC “Y” line and long line are approved for HEC.



The Boost HEC long line is approved for HEC operations. The length of the line used should give the helicopter adequate clearance of all obstacles in all phases of the HEC operations and should be safe and efficient for the needs of each individual HEC operation. Standard SOP rotor clearance is required during all phases of HEC operations.

Any unloaded HEC long line will have an appropriate weight bag attached to prevent excessive trailing during forward flight. The weight bag should remain attached to the long line. Forward flight is limited to 60 knots during any HEC operation, including flights with unloaded HEC long line.

The HEC long line will be inspected daily before use. If any abnormal operation with the long line occurs, such as line entanglement, the long line must undergo inspection before it can be used in HEC operations.

c. Personal Lifting Devices

All personal lifting devices and the system used to attach the lifting devices to the long line must be approved for HEC. All devices and appropriate attachment equipment will undergo a daily pre-use inspection by the HEC crew for any wear or other damage. The manufacture's recommendations for proper use will be followed. Harnesses used will provide upper body stabilization and prevent the unlikely event of inversion by utilizing two septate attachment points.

18.5 Normal Procedures

The following procedures will be followed by all HEC crew during class B HEC operations. Due to the dynamic nature of HEC operations it is essential the pilot takes all variables into consideration. There is inherent risk associated with Class B HEC operations. It is important that everyone involved in the operation stay active in risk analysis throughout the entire operation. All variables should be considered to arrive at a GO/ NO GO decision. The PIC retains ultimate authority for a GO/ NO GO decision when safe operation of the aircraft is a factor.

a. HEC Briefing

Before conducting Class B HEC operations, all persons involved in the HEC operations will participate in a briefing led by the PIC. As a minimum, the following shall be addressed during the mission briefing:

1. Project goals and expected workflow
2. Load weights, performance factors, and refueling plan
3. Pilot and crewmembers' responsibilities
4. Communication plan
5. Landing zone/HEC drop zone hazards
6. Weather and environmental hazards
7. PPE
8. Emergency procedures and plans
9. GO/NO GO authority

b. Helicopter Pre-Flight Inspection

It is important to note that the primary and secondary HEC hook must be installed at the proper locations on the Boost HEC lug beam for HEC operations.
Before conducting Class B HEC operations, the following pre-flight inspections should be completed in addition to the normal aircraft daily pre-flight. The following HEC pre-flight check will be used by the mechanic and pilot for instillation and inspection of the HEC system.

Maritime Helicopters

HEC Preflight Check

N Number_____ Date_____

Serial Number_____ ACTT _____

Reference ICA-B1514--10 dated Oct 2018	REFERENCE	MECHANIC'S INITIALS
Before Exterior Check		
1. HEC Hook installed on the right hand lug and Cargo Hook on the left hand lug.	2-3-A	
Note: The opening for both hooks should face the right side of the aircraft.	2-3-A	
Exterior Check		
Check the following dual hook components for condition and security	2-3-B.1	
1. 3-Lug Beam	2-3-B.1	
2. Cargo Hook attachment hardware	2-3-B.1	
3. HEC Hook attachment hardware	2-3-B.1	
4. Electrical harnesses	2-3-B.1	
5. Cargo Hook release cables	2-3-B.1	
6. HEC Hook hydraulic hoses	2-3-B.1	
7. Belly connectors	2-3-B.1	
8. Swing the HEC Hook, Cargo Hook and Beam assembly to its full extremes to verify that the electrical harnesses, cable realese and hydraulic hose do not limit full travel.	2-3-B.1	
Check the following personnel carrying system components for condition and security	2-3-B.2	
1. Y-Rope/Lanyard	2-3-B.2	
2. Longline	2-3-B.2	
3.Leader assy w/weighted bag/swivel/etc.	2-3-B.2	
4. Crew & subject harnesses/bags/etc.	2-3-B.2	
5. Attachment hardware	2-3-B.2	
Interior and Prestart Check		
Cargo Hook System	2-4-A	
1. Complete all applicable function checks	2-4-A	
HEC Hook System	2-4-B	
1. Primary quick release master cylinder for condition, security, and proper fluid level	2-4-B	
2. Unlock the master cylinder & squeeze lever (HEC hook should open)	2-4-B	
3. Lock PQRS master cylinder lever (release lever should be immobilized)	2-4-B	
4. Reset the HEC hook to locked position (confirm hook lock indicator shows fully locked)	2-4-B	

Maritime Helicopters

HEC Preflight Check

Reference ICA-B1514--10 dated Oct 2018	REFERENCE	MECHANIC'S INITIALS
5. Backup quick release system control box for condition and security	2-4-B	
6. HEC PWR&HEC CNTL CBs energized (HEC RELEASE LED display is on)	2-4-B	
7. HEC ARM switch is up (HEC RELEASE & ARMED LED display is on)	2-4-B	
8. Lift guard & release press HEC release switch (HEC hook opens)	2-4-B	
9. Reset the HEC hook to locked position (confirm hook lock indicator shows fully locked)		
Before Takeoff		
Cargo Hook system as applicable	2-7-A	
1. Electrical release CB is energized	2-7-A	
2. Mechanical release system is available for deployment	2-7-A	
HEC Hook system	2-7-B	
1. LOCK the PQRS master cyclinder (release lever immobilized)	2-7-B	
2. ARM the BQRS control box (HEC RELEASE & ARMED LED display is on)	2-7-B	

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c. HEC Equipment Inspection

Before conducting Class B HEC operations, the HEC crew will check themselves and each other (buddy check) for the following:

1. Harnesses and attachment equipment are in good working order
2. Harnesses are properly fitted, buckles are fastened correctly, no twists, and loose straps are secured
3. Two separate points of attachment are properly secured to the HEC long line
4. Helmets are properly fitted and chinstrap fastened
5. Eye protection secured
6. Hearing protection secured
7. Sleeves and pants are down and cover over gloves and boots
8. Radios, if applicable, are operational and on correct frequency
9. All loose items are secured
10. HEC operational radios working and on correct frequency (if applicable)

d. Inserting HEC Crew

Before flying begins, communication (radio and/or hand signals) must be established between the pilot and HEC crew. The pilot should continually evaluate the HEC operation locations and consider the following:

1. Size and slope of area to place HEC crew
2. Wind conditions
3. Rotor clearance
4. Ground and aerial hazards
5. Aircraft performance and controllability

The HEC crew should remain clear of the helicopter and will not be fastened to the HEC long line while the helicopter starts. Once the helicopter lifts off the ground the HEC crew should watch the long line for any entanglement while the line is being lifted off the ground.

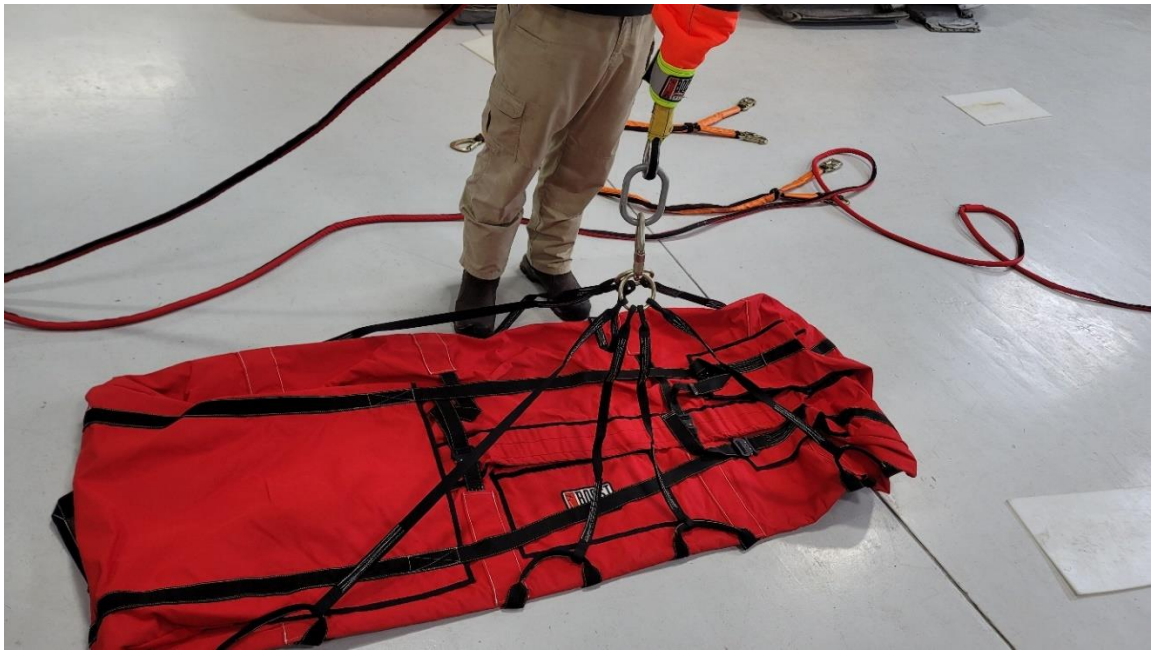
1. Helicopter establishes hover
2. HEC crew attaches to HEC long line
3. HEC crew give pilot the “ready’ signal with head and/or hands. If two HEC crew are being flown together, one should tend to the line while the other is responsible for communication.
4. Pilot lifts HEC crew off the ground three to five feet and holds in a hover check
5. HEC gives “ready” signal if all HEC gear is secure and ready for flight
6. Pilot lifts HEC crew and flies to worksite. Pilot should observe the HEC crew during transport.
7. At the work location, the HEC crew or spotter can assist the pilot with the vertical reference by calling out height above the ground over the radio.
8. Once the HEC crew is on the ground, sufficient time should be given for the HEC crew to stabilize and secure themselves before releasing form the HEC line.
9. Once the HEC crew unhooks from the line, they should step back and give the pilot the signal they are clear
10. The pilot will lift the line and depart the area

e. Extracting the HEC Crew

1. Prior to extraction of the HEC crew, any pertinent new or change in any situation should be relayed to the helicopter crew.
2. Unnecessary people should be moved away from the extraction site.
3. Pilot lowers the HEC line to the HEC crew
4. HEC crew attach to the line and give the “ready” signal.
5. Pilot lifts HEC crew and preforms a hover check.
6. HEC gives the “ready” signal
7. Pilot lifts HEC crew clear of obstacles and flies to landing area. Pilot should observe the HEC crew during transport.
8. At the landing location, the HEC crew or spotter can assist the pilot with the vertical reference by calling out height above the ground over the radio.
9. Once the HEC crew is on the ground, sufficient time should be given for the HEC crew to stabilize and secure themselves before releasing form the HEC line.
10. Once the HEC crew unhooks from the line, they should step back and give the pilot the signal they are clear.

f. Boost ER Aerial Platform Bag

The Boost ER Aerial Platform Bag can be used to extract HEC crew that has become injured to the point where they are immobile and unable to get to a landing zone or extraction zone.

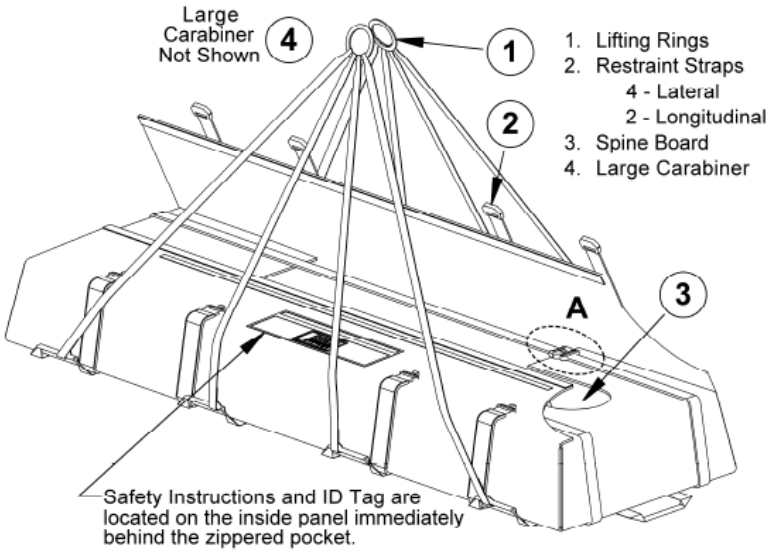


When able, another HEC crew should ride on the HEC line with the patient in the Aerial Platform Bag to assist in HEC operations in flying the Aerial Platform Bag. The two-point attachment on the BoostER Aerial Platform Bag attaches to the HEC line via the Large Carabiner. The HEC crew riding with the Aerial Platform Bag attaches to the HEC line using the normal harness and normal attachment rigging.

The BoostER Aerial Platform Bag should be used to extract the injured crewmember and transport them to the nearest suitable landing zone. It is not an ideal solution for long sustained flights. Once the injured crewmember is at the nearest suitable landing zone, the helicopter should be landed and configured for flight with an internal litter kit. The injured crewmember can then be transported, via the internal litter kit, to the appropriate location.

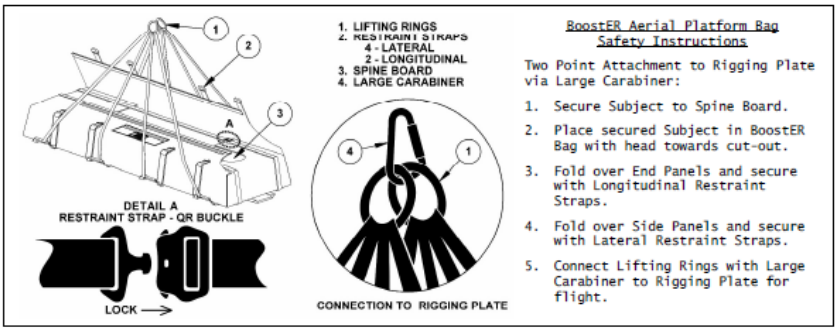
To secure the injured the crewmember in the BoostER Aerial Platform Bag:

1. Secure subject to spine board
2. Place secured subject in the Boost ER Bag with head towards the cut-out
3. Fold over end panels and secure with longitudinal restraint straps
4. Fold over side panels and secure with lateral restrain straps
5. Connect lifting rings with large carabiner to the HEC line



NOTE

The Spine Board is not part of this kit.



g. Post Flight

1. After any HEC mission, a post flight de-brief should be conducted. The debrief should include the following:
   - Provide feedback to all involved personnel
   - Identify areas and tasks that worked well
   - Identify lessons learned
2. The PIC is responsible for completing the required documents to include:
   - HEC logs for equipment used
   - Personnel currency logs

18.6 Emergency Procedures

Preplanning for emergency procedures is a critical component of risk management. Accordingly, this HEC program must evaluate and discuss the variety of potential scenarios and actions that may best mitigate any unplanned event. Training for effective crew resource management should be a part of this process.

It is imperative that everyone involved in HEC operations understand how instantaneous an in-flight emergency can occur. Survivability of HEC crew during an in-flight emergency is best accomplished by having suspended personnel remain attached to the HEC line as the pilot makes an emergency landing. In case of an aircraft emergency, the pilot will conduct a landing (e.g. autorotation) with HEC crew attached to the HEC line.

HEC operations are inherently dangerous and could be fatal. This must be discussed in detail during training, recurrency and mission briefings.

Examples of formalized emergency planning procedures are outlined below.

When dealing with emergency procedures, the pilot should consider all factors, training, and flight manual procedures. The pilot should take extra precaution get the HEC crew on the ground safely. Once on the ground, the HEC crew should rapidly unhook from the HEC line and seek protection.

a. Helicopter Control and Power is Maintained

Examples: Caution indicator, chip light, gradual loss of oil pressure, etc.

- Notify HEC crew and set them on the ground as soon as possible
- Continue with the flight and notify the all involved personnel that a precautionary landing will occur as soon as a suitable landing area is found.
- Once on the ground, the HEC crew rapidly unhook form the line and seek protection.

b. Helicopter Loss of Control or Power, Engine Failure

Examples: Loss of tail rotor authority, transmission failure, compressor stall, engine failure, hydraulic boost pump failure, etc.

- The pilot shall notify HEC crew
- The pilot shall attempt to get the HEC crew on the ground.
- The HEC crew shall rapidly unhook from the HEC line and seek protection.
- The pilot should attempt to maneuver the helicopter away from personnel on the ground.

c. HEC Line Entanglement

In the event of line entanglement, the pilot may have to jettison the HEC line. The pilot shall notify the HEC crew that the line may be released.

NOTE: Again, it is imperative that potential emergency scenarios, actions and reactions likely required of all involved personnel are discussed as thoroughly as possible prior to flight.

Ongoing efforts within the helicopter HEC community to improve the survivability of personnel during both normal flight operations and in the event of an unplanned emergency include:

1. Improved pilot release systems.
2. Training in cockpit resource management, situational awareness, and risk management.
3. Water ditching.
4. Improved pilot proficiency testing and evaluation.
5. Emphasis on typical terrain training.
6. Acquisition of the best machine for the job.
7. Information sharing on “lessons learned”.
8. Evaluation and testing of new technology which could lead to operational improvements and safety.
9. Improved PPE
10. Interface with the international HEC community.
11. Organized helicopter HEC workshops.
12. Pursuit of additional program funding for training and equipment.

19 Firefighting Operations

Maritime Pilots are certified for firefighting through the Department of Interior's Aviation Management Directorate. Pilot's require three courses through the Interagency Aviation Training website and demonstrate water bucket skill with a flight evaluation from a DOI check pilot. Qualified pilots are issued an Interagency Helicopter Pilot Qualification Card.

The primary reference for firefighting is the Interagency Helicopter Operations Guide (IHOG). Firefighting will be accomplished with aircraft buckets that have been inspected prior to use.

19.1 Task Flight Risk Assessment Profile #5 AND #9 Residual Risk -LOW

The following hazards are present when conducting vertical reference operations:

a. Blowing debris during landing/takeoff.

b. Inadequate rigging.

c. Inadequately trained personnel.

d. Snagged cable on ground.

e. Reduced aircraft performance.

f. Settling with power.

g. Inadvertent release of cargo.

h. Empty cable contacts tail rotor during flight.

i. Downdrafts/Gusty winds.

j. Failure of lifting equipment.

k. Fuel exhaustion.

m. Engine failure while operating within the height/velocity diagram.

n. External load operation.

o. Uncontrolled personnel in the helicopter landing area.

p. Passengers contacting rotor system when boarding or deplaning aircraft.

q. Passengers carrying loaded weapons in passenger compartment.

r. Loading aerosol bear repellant in passenger compartment.

s. Operating aircraft outside design limits due to cargo loading.

l. In-flight loss of control of the load.

19.2 Normal Procedures

Aircraft Bucket Systems

Bambi buckets are designed for a 24 volt electrical system. The water drop button, usually installed in the cockpit in civil helicopters, or operated by the crew chief in military aircraft, should be a momentary, normally open switch. The installation of the drop button and associated wiring must meet the applicable regulations, whether military or civilian. Use approved methods, with wire size designed to meet the load carrying needs and with fuse/circuit breaker protection.

The switch itself should be mounted securely in a way that it is protected from damage and is easily operated by the pilot. It is suggested that it be mounted on either the collective or the cyclic stick grips. Civil operators working for U.S. Federal agencies should read contract specifications concerning installation details.

Bucket Operation

The mechanical operation of the Bambi bucket is quite simple and is therefore almost foolproof. The bucket has a spring reel that winds up the cable which is attached to the dump valve (udder). When the bucket is empty, the reel retracts the cable and, in its fully rewound position is locked by a cam mechanism. A fill is accomplished by dipping the bucket into the water source and then gently lifting until clear of the water.

Because of the lock, the water cannot escape. When ready to drop, the release button is depressed and a solenoid releases the locking system, allowing the weight of the water to unwind the spring reel and open the valve. After the water flows out, the spring reel rewinds and the lock resets, preparing the bucket for the next drop.

The drop control switch should be pressed before the target is reached to allow for the slight delay while the dump valve opens and for the time required for the water to fall. By trial and error, through practice, this lead time can be easily learned. It is important to release the drop button a second or two after pushing it, since the solenoid could bum out if current is kept applied for a lengthy period of time.

The Bambi Bucket is very reliable and should need only occasional preventive maintenance.

Troubleshooting & Preventative Maintenance

- Failure of solenoid to release dump valve.
- Check electrical connections on connectors.
- Check solenoid operation or sticking of toggle lock mechanism, this is often remedied by lubrication.
- Check for continuity of solenoid coil.
- Solenoid works, but valve does not release.
- Check toggle locking mechanism for freedom, wear and lubrication.
- Make sure steel cables are not tangled, crossed or kinked.
- Failure of dump valve to reset after drop.
- Rewind spring may be broken - very rare.
- Internal parts of control head are corroded, clean and lubricate inside of control head.
- Debris in bucket may be obstructing valve.

Preventive maintenance:

- Rinse the bucket and control head after missions, when using foam concentrates.
- Lubricate interior mechanism prior to long term storage.
- Lubricate all steel cables frequently with a light preservative oil.
- Occasionally spray a WD-40 or LPS type of lubricant into the spring reel.
- This is prone to rusting if put away wet.
- Inspect and repair damage when found, this will keep your bucket serviceable.
- It is recommended that pilots and maintenance personnel read the Bambi Bucket Operations Manual.

Preflight Considerations

- A proper preflight of the bucket and cargo hook is essential for safety and reliable operation:
- Check electrical and mechanical cargo hook release mechanisms.
- Check cargo hook for cracks, wear and other damage.
- Check Bambi control head lifting ring for wear and security.
- Check Bambi support cables for wear, broken strands and corrosion.
- Check cable attack lugs on control head for cracks and bolt security.
- Inspect bucket shell for damage and wear.

19.3 Flight Techniques

Bucket Fill Procedures

The approach to the water source should be made carefully, observing for obstacles and planning for unseen ones. Wires frequently cross bodies of water and their support poles or towers may be difficult to see. Rivers in mountainous regions often have cables crossing them near the surface and low head dams are occasionally found.

Lakes and Slow-Moving Water

The basic technique in filling is to approach the water in a steep approach. Watch the bucket's shadow on the water surface and note that the bucket itself and the shadow will appear to move toward each other as the bucket nears the water surface. This reference will aid the pilot in determining the bucket height. Very slight forward movement will help tip the bucket over when it touches the surface. This method will also help prevent rotor wash from blowing the bucket forward of the aircraft as it reaches the surface.

As the bucket sinks, refer to fixed objects on the shore to prevent drifting. It is very easy to watch the water surface and try to reference to the ripples, which will cause drifting as the ripples and waves move. Staying near the shoreline aids in remaining stationary and makes for a short swim if a power failure occurs. Continuing forward at a VERY low speed will fill the bucket rapidly and, after minimal practice, a pilot should be able to dip and go without stopping.

CAUTION: Do NOT maintain enough forward speed to cause jerking on the cargo hook.

It is recommended that the neophyte dipper touch down with NO forward movement and remain stopped before lifting the bucket out of the water. When empty at low airspeeds, the bucket cables may occasionally wind up. While lifting, the weight of the bucket will cause the cables and bucket to unwind as the cables straighten out. If the bucket unwinds too rapidly, it will place a severe twisting load on the cargo hook. Try to watch the bucket as it is being lifted, either in a mirror, directly, or by using a crew member. If the cables have in fact wound up, do not lift the bucket completely out of the water. Lifting it partially out will control the rate of this unwinding effect. Dipping should be practiced thoroughly before actually working on a fire.

Large Bodies of Water

Very large bodies of water can present some difficulty in maintaining a stable hover during filling. The illusion of movement from the swells and waves is very pronounced, with the pilot trying to maintain a static horizontal position by referencing his/her position with this moving surface. It is even more important to fix on points on the shore, or even rocks and pilings in the water, to prevent drift.

Since swells present a rising and falling surface, try to time the lift with a rising swell. When operating over salt water, pay attention to corrosion and rinse the aircraft frequently with fresh water. Inform maintenance personnel should of any salt water be used.

Fast-Moving Water

Rapidly moving water, such as that found in mountain streams, presents some challenges. The bucket will act as a drag chute in the fast current and may overpower the helicopter. Be alert and ready to release the water or jettison the bucket itself. Since the current will tend to pull the helicopter downstream, it is safest to face the helicopter upstream against the current. This will place the aircraft in a nose low attitude, much safer than being drug downstream and having the helicopter in an extreme tail low attitude where a tail rotor strike in the water could occur.

During mornings in the mountains, down-canyon winds will usually be found. This will allow the helicopter to take-off into the wind and into the current. This gives the best control but does mean a climb upstream. As the day progresses the winds will switch to up-canyon ones, and now the pilot must decide on which is the greater to overcome, the current or the wind. This is a judgment call and each situation will require its own individual decision. If confronted with these problems, remember to look for bends in a river that may give the best winds, and look for pools where the speed of the current is the least.

Portable Tanks

Occasionally, portable tanks will be set up due to a lack of natural water sources. It is necessary to come to a stationary hover during dip and lift off to prevent damage to the tank. A person on the ground can be helpful in guiding the helicopter. Filling portable tanks is a mission that may occur. Use techniques similar to dipping out of one. Come to a stationary hover centered over the tank, being careful not to bump the full bucket against the sides of the tank, and release the water. Be aware of any movement of an empty tank from rotor-wash. It may be necessary for the ground personnel to place some large rocks in the tank to hold it down. After a few drops have been made into it, the water will hold it in position.

19.4 Drop Procedures

Airspeed & Altitude Management

Controlling drop density is done with varying airspeeds and altitudes. It is recommended that initially the pilot start with an airspeed of 60 kts. or above (consult the flight manual for the best single engine climb speed or the best autorotational airspeed), and a bucket altitude above the drop zone of approximately 50 feet. As the pilot develops his flying technique with this starting point, departure from it can be practiced for different conditions. On light fuels (grasses), fly at higher airspeeds up to 90 kts. to lay the longest line. If length is not needed, but a greater width in a small space is required, then go slower but at a higher altitude.

The greater altitude will allow the water/foam to aerate more and be dispersed over a larger area. Heavier fuels or more concentrated areas such as brush piles may dictate a slower or a lower drop to help concentrate the water. This is a compromise with safety as low airspeeds and low altitudes do not allow any margin for error or mechanical failure. A slow drop at a high altitude may provide the wetting necessary without undue rotor wash, but it may place the aircraft in a critical part of the height- velocity envelope. Experience has shown the low airspeeds usually do not gain as much benefit as expected for the increased risk.

Basic Flying With a Water Bucket

Flying a water bucket is very straight forward. Use good basic technique, keeping the ball centered, avoiding slipping and skidding and keeping turns coordinated. Clumsy or careless use of the pedals will certainly start sideways oscillations of the bucket. When a bucket is full of water, it is very stable and should not present any problems to the pilot. When empty however, it may have a tendency to swing at certain airspeeds.

The important point to remember is that like other external loads, airspeed must be adjusted accordingly. Fore and aft swinging of the bucket is also a result of pilot induced oscillations. To stop these, it is usually easiest to slightly increase airspeed and then maintain it. Notice any fore and aft movement of the cyclic stick, you may not be aware that you are inducing it.

Flight trainers and standardization pilots please note: If a pilot is having difficulty flying the bucket, you should review basic flying techniques.

Wind Drift

For precise water drops a correction for wind must be made. The higher the drop, the greater the drift will be. In high wind conditions it may be necessary to lower the drop altitude. If possible, do a turn after the drop, a visual check can inform the pilot on the degree of drift. This information can be used to adjust the next drop. An error towards the unburned area of the line is more efficient than having the water land inside the burn.

Approach Departure

When approaching the drop zone it is important to plan both the approach and departure routes. The safest way in to the drop zone must allow for the safest way out, and must consider the possibility of a bucket malfunction and the inability to release the water. A cautious pilot will be constantly planning for an engine failure.

Flight Hazards

Water dropping has several hazards that must be constantly considered, including the hazards of low level flight, steep terrain, poor visibility, and aircraft congestion on larger fires. A vigilant eye must be kept for an unannounced news aircraft.

Flight Safety

Aerial firefighting operations are frequently conducted in steep terrain, with turbulent wind conditions, and with reduced visibility due to smoke. Fires are often very congested, with many aircraft working in a small area the potential of a mid-air collision or a wire strike is ever present. You must constantly think safety and know your own limitations.

19.5 Operational Considerations

Communications

Coordination of all aircraft on a fire is the responsibility of the Air Tactical Group Supervisor. Constant monitoring of the dedicated communications channel is required for safe traffic flow. Discreet channels for communication with ground fire fighters are needed for efficient mission completion and for assistance, should the ground crew need it, in an emergency.

It is suggested that helicopter crews make appropriate radio calls to aid the AirTac and other pilots in flight route coordination. Good practice would include calls when departing a helibase or helispot, departing the water source, arriving on the fire scene, departing the fire scene and when arriving at a helibase.

Often an assignment will be to work with other helicopters, in this situation the pilots can work out a flight path procedure and maintain a daisy chain. The daisy chain is simply an informal "follow the leader" pattern.

Obstructions

Working in close proximity to the ground presents an ever present potential for wire strikes. It is therefore essential that a thorough search for wires be made before dipping or conducting water drops. During a reconnaissance, look for supporting towers, comers that may have wires cutting diagonally and places where power would likely be needed, such as a pump house. Information should be immediately relayed to other flight crews as wires, towers, and other hazards are discovered. It is also recommended that wire cutters be installed. Make hazards known to the AirTac and helibase manager and ensure that they are posted for everyone to see.

Mid-Air Conflicts

Since there are frequently other aircraft working the fire, and the occasional unannounced news helicopter, it is necessary that constant vigilance be maintained. Notify AirTac of rogue aircraft.

Visibility

Reduced visibility presents an increased hazard in terrain avoidance, wire strikes and mid-air collision. Be certain that you know what is on the other side of the smoke before flying through it. DO NOT fly through it if you cannot see through it. If you do go IFR, get on the instruments and climb above the surrounding terrain. Let AirTac and the other aircraft know what you are doing.

Flight Routes

Plan flight routes to avoid flying over personnel and equipment and plan an escape route when setting up for a drop. The loss of power, failure of bucket to open, wind shift, or other unforeseen situations could seriously jeopardize safety. Always be prepared to jettison the water or, if necessary, the entire load. Keep the cargo hook release armed when in the drop area. Keep airspeed high enough to achieve the best autorotational glide or single engine performance.

Maneuvering

Plan all maneuvers so that they may be completed even if the load does not jettison. Be on the guard for a power settling situation while loaded. A void abrupt maneuvers that increase loading, particularly near the ground.

Unimproved Landing Areas

Landings on a fire site are usually to an unimproved area and proper surveillance for obstacles on the ground, sloping terrain, and debris must be made. Landing in the burned area presents a condition similar to the "white-out" that snow landings present. The fine ash remaining after an area has been burnt over must be dealt with in the same manner as powder snow. Several water drops on the LZ would likely eliminate this problem. One technique is to make a low, slow pass over the proposed LZ and watch to see how much ash is stirred up.

Safety Equipment

Flight crews must be equipped with and use personal protective equipment; flight helmets, nomex flight suits, gloves and personal floatation devices.

19.6 Communciations

Will be IAW the Fire Traffic Area for the fire.

19.7 Weather Minimums

½ mile visibility for all firefighting operations

19.8 Emergency Procedures

Not used.

19.9 Management Approval

Not used.

19.10 Supporting Information

Interagency Helicopter Operations Guide, 2009

20 Pipeline Patrol Operations

The periodic inspection of product pipelines is a regulatory requirement. As well as checking for any signs of a leak from or damage to a pipeline, the inspection is to check that there is no danger to the integrity of the line from nearby construction or drainage work. The use of helicopters is often the most effective way of achieving this task. Additional hazards are introduced by the need to operate at an altitude which is lower than optimum for normal operations. These hazards can be managed by complying with the following guidance.

20.1 Task Flight Risk Assessment Profile #17 Residual Risk -LOW

The following hazards are present when conducting pipeline patrol operations:

a. Collison with static wires, guy wires or conductors.

b. Unable to see wires in flight path when landing or take off.

c. Loss of aircraft performance due to loss of translational lift, LTE, or OGE hover.

d. Canetary or suspension cables.

e. Collision with structures or towers.

f. Controlled flight into terrain.

g. Engine failure while operating within the height/velocity diagram.

h. Settling with power.

i. Loss of tail rotor effectiveness.

j. Bird Strikes.\

k. Loss of situational awareness due to sun, low light or haze.

l. Landing with inadequate main/tail rotor clearance.

m. Inadequate training or proficiency of the crews involved.

20.2 Normal Procedures

General Guidelines

All pipeline patrol operations will be conducted IAW the following guidelines:

a. The flight altitude for pipeline patrol will normally be 400 to 500 feet above ground level and flown following the ground contour.

b. When the aircraft is required to be flown below 400 feet above ground level (These times should be of limited duration) the maximum speed will be 60 knots (Industry Best Practice)

c. The aircraft will be flown to the side of the pipeline right-of-way with the observer being positioned nearest the pipeline.

d. An observer is required for all pipeline patrol operations.

e. In the event of an oil spill, the helicopter must: (Until it has been determined that it is Safe)

a. Fly no lower than 300 feet above ground level.

b. Land no closer than ¼ mile upwind.

c. Land no closer than 1 mile downwind.

Aircraft Configuration

Aircraft conducting pipeline patrol operations will be equipped as follows:

a. Wire Strike Protection System.

b. Pulse Lights.

c. Radar Altimeter.

NOTE: Flight Crewmember RII Training is aircraft specific and identified on training records.

20.3 Communications

It is likely that pipeline inspection aircraft will be below radio coverage for a significant portion of the time. This requires climbs to a higher altitude to achieve VHF-FM communication.

20.4 Weather Minimums

All aerial survey/pipeline patrol operations will be conducted under Day Visual Flight Rules (VFR) conditions. The minimum in-flight visibility must be at least 1 statute mile.

20.5 Emergency Procedures

Pilot shall respond to any emergency as defined in the Rotorcraft Flight Manual. Time allowing pilots shall communicate their emergency on 121.5, another appropriate frequency, or with the Satellite phone installed on the aircraft.

20.6 Management Approval

Not Used.

20.7 Supporting Information

APSC- Air Operations Manual AO-42.

21 Single Skid/Toe-in/Hover Exit (Step) Operations

The use of single-skid, toe-in and/or hover step exit/entry maneuvers are driven by a variety of factors. These include; condition of the terrain, slope, obstacles, wind, snow depth and vegetation coverage. In addition to environmental considerations, it is critical that the pilot performing these maneuvers be proficient.

"**STEP**" is defined as **S**ingle-skid, **T**oe-in and hover **E**xit/entry **P**rocedures. There are three separate STEP maneuvers to be conducted in this mission profile. (For the purpose of this document references to skids also apply to other helicopter landing gear configurations).

NOTE: As a result of flight manual limitations dealing with lateral weight and balance, some make/model helicopters cannot be used for one or more of the STEP activities.

Single-skid - One skid or a portion of one skid is in contact with the surface while the other skid is (due to terrain considerations) not in contact with the surface.

Toe-in - The toes (forward portion of the skids) are in contact with the surface, while the aft section of the skids is not in contact with the surface.

Hover - The helicopter remains in a hover above the surface of the terrain with skid to ground clearance of no more than 24 inches.

21.1 Task Flight Risk Assessment Profile #18 Residual Risk - Moderate

The hazards associated with STEP operations are:

a. Dynamic Rollover.

b. Abrupt changes in Center of Gravity.

c. Injury to exiting personnel.

d. Main Rotor contact with terrain.

21.2 Normal Procedures

STEP operations should be avoided whenever possible. Field crews should always look for flat landing spots so the pilot can make a conventional, full skid landing. STEP operations are much riskier than regular landings, as it is critical for the pilot to maintain stability of the helicopter at all times. Prior to conducting any STEP operation, the entry and exit procedures will be practiced on the ground with the engine off before they are performed in the field.

These maneuvers should only be done with experienced field crews who have developed a solid working relationship with a pilot experienced in making these maneuvers.

Restrictions:

Toe-In Landings- will not be attempted unless the forward 1/3 of both skids is in contact with the surface.

Single-skid Landings- will not be attempted unless 2/3 of the skid is in contact with the surface.

Passenger Hover and Toe-in Landings (exits).

a. Passengers will not be allowed to exit when the skids are more than 24" off the ground.

b. When disembarking, be especially careful not to make an unexpected movement that suddenly transfers weight onto or off a skid during the maneuver. All movements and weight

transfers must be slow, smooth, efficient, and controlled, passengers will STEP rather than jump on/off skids.

c. After stepping carefully and smoothly off a skid, crouch at a predetermined distance while the helicopter takes off.

d. When it is necessary to retrieve cargo from a compartment on the pilot's side of the helicopter, never duck under the tail boom. Only cross carefully in front of the pilot.

NOTE: HOGE performance is required for all STEP operations.

Client Restrictions

The following Clients are contractually prohibited from conducting STEP operations:

a. Alaska Fire Service (BLM)

b. Alaska Department of Forestry

Procedures:

Single-skid operations: The approach to and departure from the area will be predicated upon the surrounding barriers. The pilot shall utilize slope landing techniques to maintain heading, drift and a level attitude throughout the maneuver.

Toe-in operations: The approach to and departure from the area will be predicated upon the surrounding barriers. The pilot shall utilize slope landing techniques to maintain heading, drift and a level attitude throughout the maneuver.

Hover exit operations: The approach to and departure from the area will be predicated upon the surrounding barriers. The pilot shall maneuver the helicopter to a hover within 24" of the surface. The altitude must be close enough to the ground to allow the passengers to STEP down to the surface without jumping.

21.3 Communications

Not used.

21.4 Weather Minimums

The maximum wind for STEP operations is 20 Kts. and zero knot gust spread.

21.5 Emergency Procedures

Pilots shall respond to any emergency as defined in the Rotorcraft Flight Manual. Time allowing pilots shall communicate their emergency on 121.5, another appropriate frequency, or with the Satellite phone installed in the aircraft.

21.6 Management Approval

Tier 1 approval is required prior to conducting STEP operations.

21.7 Supporting Information

Not used.

22 Overwater Operations

The vast majority of the operations conducted by Maritime Helicopters Inc. fall into the category of Overwater Operations. Proper passenger briefings are essential to a safe operation.

22.1 Task Flight Risk Assessment Profile #19 Residual Risk -LOW

The hazards associated with Overwater operations are:

a. Engine Failure overwater.

b. Controlled Flight into Terrain.

c. Survival of occupants in the event of a water landing (Successful float inflation).

d. Survival of occupants in the event of a water landing (Unsuccessful float inflation).

22.2 Normal Procedures

Restrictions:

a. Only float equipped aircraft (fixed or emergency pop-out floats) will be operated beyond power-off gliding distance from shore. (Shore is defined as a safe suitable landing area.)

b. All aircraft operated over water will be equipped with appropriate personal protective equipment for each occupant and at least the following:

1. Life rafts with the capacity to hold all aircraft occupants.

2. Personal flotation devices for all occupants, (The pilot must wear his personal flotation device at all times.) After April 24, 2017, all occupants must wear a personal floatation device with a survivor locator light when the aircraft is operated beyond glide distance.

3. For extended overwater flights (beyond 50 nautical miles from shore, or offshore heliport structures) the aircraft must be equipped IAW FAR 135.167.

c. All night overwater flights require TIER 1 approval and will be conducted utilizing two pilots.

d. Day VFR overwater single pilot operations are authorized, providing the aircraft is landed NLT EECT.

22.3 Communication

Not used.

22.4 Weather Minimums

The pilot must maintain visual horizon and a visual surface reference with the surface at all times. The cloud and visibility requirements needed to maintain reference can vary greatly based on the area the flight is conducted over. At no time will the aircraft be operated offshore without a visible horizon that distinguishes the water and the sky. Emergency Procedures

22.5 Management Approval

Tier 1 approval is required prior to conducting night Overwater operations. Supporting Information.

22.6 Supporting Information

Not used.

23 Electronic Flight Bag

Maritime Helicopters Inc. has selected the Apple iPad 11 inch and/or the Apple iPad Mini as the approved Electronic Flight Bag (EFB) for flight planning and operational use in-flight. Refer to the ForeFlight Checklist for detailed instructions.

23.1 Preflight

a. All company pilots will use either the company issued Apple iPad Air or Apple iPad Mini as the approved Electronic Flight Bag (EFB) for flight planning and operational use in-flight.

b. All company iPads (both primary and backup) will be fully charged before the first flight of the day. 50% minimum charge before a flight. 75% charge if using continuous ADS-B/in-flight weather (ADS-B currently not supported). All accessories will be available and charged.

c. Pilots are responsible to ensure that the latest updates to both Apple iOS and ForeFlight Mobile software have been installed before each flight.

d. Pilots are responsible to ensure that all charts for each leg of the flight are downloaded and current before the flight occurs.

e. Terminal Approach plates are to be downloaded and placed in ForeFlight Mobile Binders inside the application for each primary and alternate airport for that day.

f. Airport Information, to include METARs, TAFs, Winds Aloft and appropriate imagery for the departure airport, route of flight and alternates are to be reviewed before each flight.

g. The most fuel efficient route of flight and cruise altitude, weather permitting, is to be selected for each flight.

h. Current NOTAMS for the departure airport, route of flight, destination and alternates are to be reviewed before each flight leg.

i. Emailed Flight Notifications and Weather Briefings are to be saved for later review.

j. Until approved otherwise, Enable Ownship is to be set to “Limited” for the duration of the flight.

k. Screen Rotation Lock on the iPad is to be set ON for each flight.

l. An Apple approved charging adapter that delivers 2.1 amps and 10 watts of power is to be kept onboard the aircraft for inflight charging of the iPads.

23.2 In-Flight

a. iPad use in the cockpit is permitted for display of electronic charts, documents, flight planning, in-flight weather, and WiFi access for obtaining weather information. WiFi use for personal communication or other activities is prohibited.

b. Crew members are cautioned to prevent distracting activities.

c. Crew members are responsible for securing devices in-flight.

d. iPad use during sterile cockpit phases is limited to critical tasks only (e.g. reviewing approach plates).

e. iPad GPS or GPS accessories are prohibited for navigational use; in-flight use is for situational awareness only;

f. In an emergency situation, ensure that the EFB is stowed and secured before landing.

NOTE: Company computer policies apply to iPad usage. iPads are not to be used for entertainment purposes during flight or taxi operations.

23.3 Power Management

a. iPad battery life is to be monitored while the pilot is on duty. Pilots will pro-actively recharge the devices if concerns arise about power level.

b. Power below 20% is a caution; battery saving actions are advised, including:

c. Reduction of screen brightness to the lowest acceptable setting; brightness is the largest source of power drain.

d. Ensure iPad is in Airplane Mode: this will disable all radios and thus preserve battery power.

e. Sleep the iPad and only awake it when necessary for terminal and en-route charts.

23.4 Troubleshooting/Abnormal Procedures

a. During an in-flight iPad failure, if the backup is not available, notify ATC of an EFB failure causing loss of access to charts.

b. Consider diverting to an airport with VFR conditions if the destination and alternate are IFR.

c. If an approach is required, approach instructions should be obtained from ATC or Flight Operations.

23.5 Post-Flight Procedures

a. Record squawks for the devices, operating system, application or other.

b. Reset airport selections or other information related to the last flight.

c. Begin charging iPads and accessories.

d. iPads will be removed from the aircraft for overnight stays, used for planning and recharged when out of the aircraft.

23.6 Document Control

In order to standardize the location of company documents, all iPads will have the following binders:

a. Maritime Helicopters Inc. Drive is organized by subfolders to allow for easy access of company documents.

b. FAA. Drive is organzied by supfolders to allow fore easy acces of Regulatory Documents

c. ForeFlight. Drive contains specific instructions on the use of Foreflight.

d. NAV CANADA Drive. Not Utilized.

24 Reduced Visibility Operations

Reduced visibility operations are only authorized to be conducted during the day.

Task Flight Risk Assessment Profile #10 Residual Risk -LOW

The following hazards are present when conducting reduced visibility operations:

a. Loss of surface reference over land.
b. Loss of surface reference offshore.
c. Controlled flight into terrain.
d. Low altitude flight
e. Collision with structures or towers.
f. Spatial disorientation.

24.1 Normal Procedures

Reduced Visibility Operations are conducted when actual flight visibility is less than 3 statute miles. Pilots ***must*** adhere to the following conditions thoughout the duration of the flight.

a. Not enrolled in the High Minimum Captain Program.
b. Visible horizon **must** be present.
c. Visual surface reference ***must*** be maintained.
d. Aircraft ***must*** be operated at an altitude/airspeed that will allow the aircraft to stop and land or turn around.
e. Aircraft will not be flown over lakes.

24.2 Weather Minimums

The pilot ***must*** maintain both a visible horizon and visual reference with the surface at all times. Visibility ***must*** be greater than ½ statute mile.

24.3 Emergency Procedures

In the event the visible horizon or visual surface reference is lost, the pilot must immediately execute an Instrument Take-Off by:

a. Transitioning to the aircraft flight instruments.
b. Maintain a level attitude.
c. Maintain heading.
d. Increase collective to ensure a climb.
e. Increase airspeed by pitching the nose down a few degrees.
f. Once either the visible horizon or visual surface reference is regained, continue the flight.

24.4 Management Approval

Not Used

24.5 Supporting Information

Not Used