


7002.01	Helicopter Operations Standard Operating Procedure (SOP)	
<p><i>This procedure is for internal use only and does not enlarge an employee's civil liability in any way. The procedure should not be construed as creating a higher duty of care, in an evidentiary sense, with respect to third party civil claims against employees. A violation of this procedure, if proven, can only form the basis of a complaint by this department for non-judicial administrative action in accordance with the laws governing employee discipline.</i></p>		
<p>Related Policies: Applicable HI Statutes:</p>		

I. PURPOSE

This standard operating procedure/guideline addresses choosing and marking a landing zone, arm signals, crowd control, protective gear, approaching a helicopter, behavior and etiquette during transport, standard safety devices and techniques, use of hazardous equipment during transport.

II. APPLICABILITY

This policy applies to all HFD personnel.

III. PROCEDURES

a. **Choosing and Marking of Landing Zones:**

Helicopter transportation is available for patients when time and distance affect ground transportation time. When sufficient ambulances are unavailable, or when patients are in locations inaccessible to ground units, helicopter transportation should be considered.

Med-Evac helicopters can carry only one Immediate patient.

Helicopter medical transportation should be considered for -- Immediate trauma patients requiring urgent surgery, patients requiring specialized treatment (OB, pediatric, burns, neurological.) or any other patient Medical Control deems necessary.

1. **Landing Zones:**

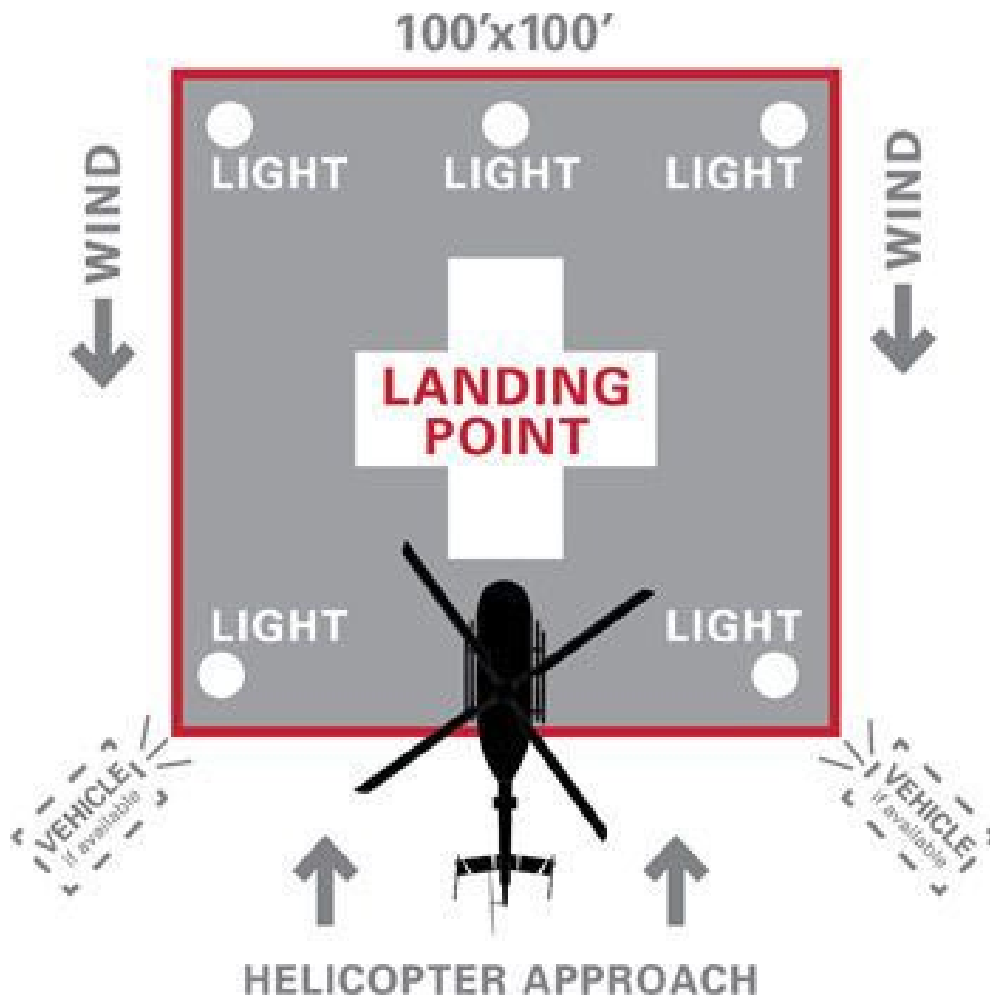
- a) The selection of an appropriate landing zone is of critical importance in all field situations. A suitable landing area must be located and identified for the pilot. Should anything become unsafe during the approach of any helicopter during landing operations instruct the pilot to GO AROUND three times.
- b) Command will assign personnel to select and identify a landing zone. The assigned personnel shall have a portable radio, eye protection, ear protection, high-visibility safety vests. All personnel assigned to the landing zone operation shall be on the designated landing zone radio frequency. Engine companies are more suitable for this assignment.
- c) The landing zone must be relatively flat and free of obstructions for an area of at least 100' x 100' for each helicopter. All spectators, vehicle traffic (including emergency vehicles) and animals must be kept a minimum of 200' away from the landing zone. Ideally, in the center of the landing zone, a 60' x 60' "touch down" area shall be identified with appropriate visual markers. The individual communicating with the pilot shall stand at the front right corner (as seen by the pilot) of the touch down area. A visual check should be made for overhead wires, poles, towers, and similar obstructions. Any obstructions noted must be communicated to the pilot before he/she is committed. The pilot can then assess the obstruction.

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- d) The approach and departure paths (into the wind) must be free of obstructions. For heavily loaded helicopters (i.e., water drop), the clear path should extend at least 100 yards in each direction.
- e) Approach and departure paths should not pass over a treatment area, Command Post, or other activity areas where noise and rotor wash will cause problems.
- f) The landing zone should be located at least 100 yards from other activity areas if possible.
- g) The landing zone and surrounding area must be free of small objects which can be blown around by rotor wash. Check for metal objects and secure loose clothing or blankets.
- h) Avoid dusty locations if possible. If the landing area is dusty, wet down the area with a hose line before landing.
- i) Once a helicopter has landed the pilot may elect to shut down for added safety in the landing zone.
- j) Radio contact and the landing zone shall be maintained for two to three minutes after departure of the helicopter in case an in-flight emergency is experienced, and the helicopter needs to return to the landing zone.





2. Arm Signals:



Clear To Start Engine



Take-off

Right hand behind back, left hand pointing up.



Hold-Hover

Place arms over head with clenched fists.



Move Upward

Arms extended, sweeping up.



Move

Downward

Arms extended, palms down, arms sweeping down.



Move Right

Left arm horizontal, right arm sweeps upward to position over head.



Move Left

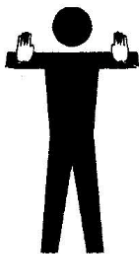
Right arm horizontal, left arm sweeps upward to position over head.



Move

Forward

Combination of arm and hand movement in a collecting motion pulling toward body.



Move

Backward

Hands above arm, palms out using a shoving motion.



Land

Arms crossed in front of body and pointing downward with back to wind.



Shut-off Engine

Slash across throat.



3. Protective Gear:
 - a) PPE consists of clothing and equipment that provides protection to an individual in a hazardous environment.
 - b) Flight Helmet: Must provide protection for the head.
Exceptions: TRT helmets or helicopter headsets may be used when a flight helmet is not necessary.
 (Flight helmets must be worn during long-line operations.)
 Fire helmets may be used by brush firefighters being transported to and from sites and firefighters in full protective clothing.
 - c) Fire Resistant Clothing: Nomex jumpsuit with length sufficient to eliminate exposure between boots and gloves, or structural firefighting coat and pants.
Exception: Brush firefighters may wear FR pants and Nomex brush jacket.
 - d) Leather Boots: Should extend above ankle.
Exception: Working in an environment not conducive to wearing leather boots.
 - e) Gloves: Should be leather or Nomex and leather.
4. Approaching and Working Around a Helicopter:
 - a) Helicopter Safety Factors:
 - Approach and depart helicopter from the front or 45 degrees from the front, in a crouching position; remain in view of the pilot.
 - Establish eye contact with pilot or observer before approaching if rotors are moving.
 - Do not approach helicopter after landing until pilot or observer signals approval to approach aircraft.
 - Approach and depart in pilot's or observer's field of vision (never towards the tail rotor).
 - At no time will personnel approach the tail area of any helicopter.
 - Landing zone personnel shall use eye protection or helmet face shields and ear protection. Helmet chinstraps shall be tightened securely.
 - Use a chinstrap or secure hardhat when working around main rotor.
 - Keep landing areas clear of loose articles that may "fly" in the rotor down wash.
 - Provide wind indicators for take-off and landings; back to the wind, arms extended in front of body.
 - Beware of rotor wash. Small objects and clothing (caps, jackets, etc.) can be blown around easily. Do not grab or chase articles blown off by the rotor wash.
 - Be aware the spotlights used to illuminate obstructions can blind the pilot. Extreme caution should be used. Only use spotlights to illuminate the bottom of poles. Do not shine upward.
 - Fasten seat belt upon entering helicopter and leave buckled until pilot signals to exit. Fasten seat belt behind you before leaving.
 - Use the door latches as instructed; caution should be exercised around moving parts or Plexiglas.
 - Do not throw items from the helicopter.
 - Carry tools horizontally and below waist level, never upright or over shoulder.

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- Secure items internally and externally on the helicopter.
 - Provide pilot with accurate weights and types of baggage.
 - Stage patients waiting to be loaded at least 150 feet away. Secure sheets and blankets and cover eyes during landing.
 - Personnel should never locate themselves beneath the helicopter when a sling load is being transported. Such sling loads may accidentally become detached, or the pilot may find it necessary to jettison the sling load to avoid an accident. Pilots shall avoid flying overpopulated areas with a sling load.
 - Fire Fighting equipment, personal equipment, lunch containers or anything that could be picked up by the helicopter prop turbulence shall not be kept in the immediate area of the heliport/helispot.
 - Eye protection shall be worn anytime working adjacent to helicopter operations.
 - It will be the pilot's responsibility to see that any loads or equipment are secure and does not exceed the manufacturers specifications for maximum load.
 - The seat belts shall always be fastened and adjusted prior to flight and shall be removed only with the approval of the pilot.
 - The danger area around a helicopter shall be all areas to the rear of the cargo hatch or exhaust port. Do not venture beyond this point.
- b) Air safety:
- Personnel shall not smoke in the aircraft.
 - Personnel shall keep clear of all helicopter controls.
 - Maps, papers, and loose articles shall be placed in a secure place during flight to avoid distracting the pilot and or getting in the way of flight controls and gauges.
 - Helmets with chin straps will be worn when in flight.
 - Assist the pilot by keeping alert for hazards such as power lines, utility poles, trees, brush, other natural hazards, and other aircrafts while in flight and while taking off and landing. Also assist the pilot by keeping a close watch on tail rotor clearance on takeoffs and landings.
 - All passengers will refrain from unnecessary conversation on the intercom during takeoffs and landings.
 - During precautionary and emergency landings, it will be the pilot's responsibility to inform the airport tower as to the location. The passenger in the front seat has the responsibility to inform Fire Communication Control of the location.
 - Rappelling from County helicopter is prohibited.
- c) Approaching the Aircraft:
- The pilot's approval for each approach and loading must first be secured before acting upon his signal.
 - Personnel shall not approach the helicopter until it has completely settled down, unless instructed otherwise by the pilot or ground crewman.
 - Personnel shall remove canteens from their belts before entering the ship.
 - Personnel shall approach the ship from the front on the downhill side, keeping clear of the main rotor and tail rotor, and in full view of the pilot at all times.

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- Long-handled tools, etc., shall be carried at the side in a horizontal position because such tools can inadvertently be raised into the rotor path with serious consequences.
 - Helmets shall be worn with chin straps secured at all times.
 - Hand tools, when carried, shall be placed in tool carriers or cargo racks if available.
 - The safety belt shall be clear of the seat and properly secured (belts must be straight in order to latch properly).
 - The personal belongings of passengers (jackets, canteens, lunches, etc.) shall be held securely on the lap. Nothing shall be placed on the floor.
 - When carrying three passengers on a 3-passenger aircraft, including the pilot, the middle passenger shall keep his left arm on his lap to allow the pilot adequate room to operate.
 - If the helicopter is equipped with doors, passengers shall not use or tamper with the red door handle. Use of this handle will jettison the door which may cause it to fly into the tail rotor.
- d) Disembarking the Aircraft:
- The safety belt shall not be unfastened until the ship is completely settled.
 - Tools and equipment shall be unloaded first.
 - Passengers shall depart to the front of the ship on the downhill side and always in full view of the pilot. (Passengers shall not leave the ship to walk to the rear.)
 - Passengers disembarking shall carry tools properly and walk to a safe location well away from the landing area.
- b. Flight Operations:
1. Flight Approval:
- a) All emergency response of aerial assets shall be dispatched by the Fire Communications Control Center (FCCC) in accordance with Dispatch Protocols.
 - b) All non-emergent operations of aerial assets shall be approved by the on-duty Battalion Chief (BC) of Operations. These operations include the use of the aerial assets for police actions, surveys, and other official functions which are non-emergent in nature.
 - c) All ceremonial and display functions of aerial assets shall be submitted, in writing, to the Assistant Chief (AC) of Operations at least one month in advance of the requested function date. The request should include a description of the event, what is being requested, the location, and the duration of the event. The AC of Operations will coordinate with the BC of Aerial Operations and receive a concurrence for the operation at least two weeks prior to the event. All missions of this nature are subject to the discretion of the assigned pilot and may be cancelled due to their concern for safety.
 - d) Helicopter landings at schools and areas with assembled children shall be limited to the following. As per memo from the Department of Education, State of Hawaii, HFD helicopters will not be permitted to land on public school ground except under the following conditions:
 - Helicopter demonstrations-static display, with prior approval.

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- Medical emergencies where landings at the school or close vicinity is necessary.
 - When no other landing site is available for HFD operations.
- e) County ball parks shall also be included in the above. In non-emergency operations, prior clearance/approval shall be obtained as much as possible. Ground security must be provided for all landings and takeoffs. Should landings be necessary and ground security not available, all precautions shall be exercised to insure public as well as firefighter and pilot safety
2. Minimum Crew:
- a) Minimum crew for the helicopter shall be one certified pilot. If possible, a Rescue Specialist of permanent rank shall serve as crew member.
3. Pilot's Responsibilities:
- a) The helicopter must be able to respond on short notice. To accomplish this, pilots shall not leave Stations 2 and 14 during normal operating hours for any personal business or activities.
- b) Pilot's must be available at the heliport during regular standby hours so that no longer than ten (10) minutes elapses between the time dispatch orders are received and time helicopter is airborne in the configuration of the mission.
- c) Minimum crew for the helicopter shall be one certified pilot. If possible, a Rescue Specialist trained in helicopter operations shall serve as crew member. This procedure does not limit other firefighters or employees from riding in the helicopter as passengers.
- d) The daily work schedule for pilots shall be in accordance with the S.O.P. 7002.02 Helicopter Daily Duties and Responsibilities.
- e) Pilot's will not consume any alcohol while on duty, on call, and will not consume any alcohol 16 hours prior to duty status.
- f) The helicopter pilot is in command of the aircraft and will fly the helicopter in a responsible and competent manner within the standards set forth by the manufacturer and the FAA. They shall determine whether the operation desired is safe. With their concurrence, Chief officers on duty shall be authorized to deviate from normal procedures when deemed necessary. The final approval for a mission will be with the Pilot of the aircraft.
4. Transportation of Personnel:
- a) All personnel being transported by helicopter is to first be briefed on the safety aspects by a member of the helicopter ground crew.
- b) No one is to approach or depart the helicopter without first obtaining the approval of the pilot or ground crew member.
- c) The helicopter shall be entered head and shoulders first and using only the hand grips installed on the helicopter.
- d) The passengers are to confirm that their doors are securely closed.
- e) Seat belts are to be worn throughout the entire flight.
- f) It will be the passenger's responsibility to see that the seat belts are returned to a loose position, clasped, and placed on the seat without any portion of the seat belt outside of the helicopter.



5. Medical Evacuation Procedures: The following safety procedures shall be employed, as far as practicable, for all medical evacuation operations at medical treatment facility heliports:
 - a) All personnel, medic units and fire apparatus will stay clear of aircraft approach areas until the aircraft has safely landed.
 - b) All personnel shall remain inside their units at the designated "standby" areas.
 - c) During medical evacuation operations at medical treatment facility heliports, an Engine crew will be assigned and on site during the operations.
 - d) All personnel within the operational area shall wear personal protective safety equipment.
 - e) Medical Evacuation missions with the helicopter shall be in accordance with SOP 7002.05, Medical Evacuation Missions

6. Rescue Procedures:
 - a) Rescue personnel shall staff the helicopter as required by the type of response. To be considered a crew member of the aerial asset, specific training is required. Although every effort will be made to staff rescue missions with aerial crew members, other personnel may be able to serve on the helicopter in a passenger capacity.
 - b) All rescue missions shall be evaluated through a composite risk analysis to determine that the risks associated with the mission have been considered and determined to be an acceptable risk. This shall be the responsibility of the Pilot and Incident Commander. The Pilot will have the final say if the mission will be attempted.
 - c) Rescue missions with the helicopter shall be in accordance with SOP 7002.06, Aerial Rescue Missions.

7. Firefighting Procedures:
 - a) Aerial assets dispatched to the scene of a wildland fire will conduct an aerial survey of the fire for situational awareness, prior to the commencement of bucket operations.
 - b) The aviation asset shall establish communications with the Incident Commander and/or ground crews prior to the commencement of bucket operations.
 - c) Helicopter water bucket operations will not be conducted during periods of darkness.
 - d) The pilot will be responsible for approving the heli-spot and location for refueling.
 - e) The Pilot will be the final approving authority in mission acceptance.
 - f) The helicopter may be utilized for transporting equipment and personnel, reconnaissance, and other missions deemed required by the Incident Commander. Final approval for mission acceptance remains with the Pilot.
 - g) Firefighting missions with the helicopter shall be in accordance with SOP 7002.07, Firefighting Missions

- c. Refueling Operations:
 1. General:
 - a) Helicopter engine shall be turned off.



- b) Helicopter and fuel containers shall be grounded.
 - c) There shall be no passengers aboard the helicopter.
 - d) A 15-pound dry chemical extinguisher shall be on hand.
 - e) No smoking within 50 feet.
 - f) No unauthorized persons within 100 feet.
2. Refueling:
- a) Collect fuel sample in a clean 1-quart jar and swirl. Samples are collected from the tank and nozzle.
 - b) Check color against the background of the sky. If water is present, free water (water not in solution) will separate and lay in the bottom of the jar.
 - c) Swirl the contents of the jar. Any free water and/or water in solution will cause the color to become cloudy.
 - d) If water is detected in the tank sample, sump and continue to test until no more water is detected in the sample jar. Do not fuel any helicopter until sample shows no contamination.
 - e) If water is detected in the nozzle sample, suspend operations immediately.
 - f) Particles in sample can also be visually identified.
 - g) If particles appear in the tank sample, sump tank until sample is clean.
 - h) Do not use fuel if any nozzle samples give:
 - (1) Wrong color, not clear or bright.
 - (2) Particles are present.
 - (3) Water is present.
3. Hot Refueling:
- a) The pilot is not to leave the aircraft.
 - b) Refueling Personnel must have:
 - (1) Full bunker gear on, including gloves and head gear with face shield down.
 - (2) 1 person to man the nozzle and the other standing by with a charged nozzle or 20 BC rated extinguisher.
 - (3) Doors on the fueling side of the helicopter closed.
4. Fuel Truck:
- a) Fuel truck will be properly maintained, clean, and reliable. Tank, plumbing, filters, and other required equipment should be free of rust, scale, dirt, and other contaminants. The fuel truck must have an effective brake system.
 - b) Spare filters, seals, and other components for refueling will be stored in a clean dry area.
 - c) The fuel tank shall be securely fastened to the truck bed and shall have a sump or sediment settling area of adequate capacity to provide uncontaminated fuel to the filter.
 - d) Gasoline driven pumps shall have a shielded ignition system and a spark arrestor.
 - e) Fuel filter and pump systems sizes should be compatible with the helicopter being serviced.
 - f) Only hoses designed for dispensing of fuel should be used. Hoses should be kept in good repair.

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- g) The fuel nozzle should include a 100-micron or finer screen, a dust protective device and a bonding clip or plug.
 - h) The fuel truck will have adequate bonding and ground cables to be used when refueling.
 - i) Fire extinguisher is to be mounted to make it accessible at all times.
 - j) The Fuel truck will have "NO SMOKING" signs with 3-inch letters visible from both sides and rear of the truck.
 - k) The fuel truck will be conspicuously and legibly marked to indicate the nature of the fuel.
 - l) The fuel truck is to be placarded with the proper DOT placard.
5. Fuel Truck Driver:
- a) The driver will demonstrate knowledge of correct fueling procedures and fueling and safety equipment installed on the fuel truck.
 - b) The maximum duty period including standby time is 24 hours. Eight consecutive hours of rest will be required before starting another duty period as the fuel truck driver.
 - c) Fuel truck drivers will not exceed 10 hours of driving within a 24-hour period.
 - d) Duty time includes standby or work status at any location.