Touchdown!

Establishing a Helicopter Landing Zone

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Emergency medical helicopter evacuation of critically ill or injured patients can be an exciting event; however, it can also be dangerous. EMS helicopters attract bystanders like magnets, mesmerizing them and sometimes causing a momentary memory lapse concerning their safety. This article will offer a review of landing zone safety, and will introduce some ideas that may be beneficial for increasing the safety of your landing zone.

Emergency helicopter operations are a critically coordinated team effort involving emergency medical, fire and police professionals, as well as aeromedical crews. Helicopter crews need your assistance in selecting suitable landing zones, warning pilots of any potential hazards and securing landing zones during flight operations.

The Landing Zone

The size of a landing zone depends on the type of aircraft used by the responding service and present lighting conditions. Night flight operations usually require a larger landing zone than those conducted in daylight. A good rule of thumb is to secure an area 100' x 100', which should be sufficient for either day or night and will allow even larger military helicopters to land.

The surface should be flat and firm. If it is very dusty, wet it down a bit to prevent dust clouds from blinding the pilot and ground personnel. Try to avoid loose, powdery snow and sand. The area should be free of any loose materials that might be blown into the rotors or engines. Never use a frozen body of water for landing, no matter how solid it seems. The surface should have a less than 10 degree slope. The following Walt (Walk And Look Triangle) Method is a quick and easy way to determine the degree of slope:

1. Place a marker in the center of the proposed landing zone.
2. Walk downhill a distance of 6 times your height (about 12 normal strides).
3. Keeping your line of sight level, look back at the landing zone center marker.
4. If your line of sight is even or higher than the marker, the slope is less than 10 degrees, and it is safe for the helicopter to land.

The landing zone should also be clear of any tall obstacles along the helicopter's approach and departure paths. Electric and telephone wires are a special hazard to helicopters, as they are much easier to see from the ground looking up than from a helicopter looking down into the ground clutter. Notify the pilot of the position of the wires. (I've flown over landing zones that had recently erected phone poles and no wires,

and I can personally verify that this makes pilots crazy!) Try to use compass bearings such as "north of the landing zone," since left or right can be confusing.

A landing zone can be marked with small, weighted cones or a flameless light source on each corner. During night flight operations, all spotlights, floodlights and handheld flashlights should be pointed at the ground-never at the helicopter. All nonessential lights should be turned off, and vehicle lights being used to illuminate the landing zone should be on low beam. Any white lights, including flash photography, can ruin a pilot's night vision and temporarily blind him. Red or blue lights, such as flashlight wand covers, can be very helpful and do not affect night vision. Strobes and rotating warning lights are useful in locating an accident scene or landing zone at night, but their use should be minimized during actual take-offs and landings.

Landing Zone Coordinator and Security

One person at the scene, who is knowledgeable about helicopter operations, should be deemed the landing zone coordinator. This person will help land the helicopter and should be the only person communicating with the pilot. The landing zone coordinator should wear eye and hearing protection, as well as long sleeves and pants (ideally, full bunker gear and a helmet with chin strap fastened and visor down).

The coordinator should position himself in the middle of the outer perimeter of the landing zone, with his back to the wind. Since a helicopter prefers to land into the wind, this allows it to land facing the landing zone coordinator, ensuring eye contact between him and the pilot. One of the most important of the landing zone coordinator's jobs is to keep an eye on the tail rotor during landing, since a helicopter pilot cannot see behind him.

Many people resist being the landing zone coordinator because of the numerous hand signals involved in directing a helicopter; however, the pilot in command is ultimately responsible for safety and will put the helicopter down where he deems best.

It's really only necessary to know the following two hand signals to get an immediate response:

1. **Both arms outstretched and pointing to indicate the landing zone.**
2. **Crossing and uncrossing your arms above your head to wave off landing. This indicates a dangerous condition or situation, and the pilot will immediately abort the landing.**

To best secure the safety of all involved, the landing zone coordinator should have three assistants. Two people will be assigned as left and right perimeter guards, positioned midpoint on their respective perimeter lines after the helicopter has landed. This allows them both a clear view of the ship, including the tail rotor. The third person remains with the landing zone coordinator to assist with equipment as needed. Some services allow the

pilot to lock down the controls at idle speed and then position himself as a tail rotor guard.

Many areas require their fire department to be present at all helicopter landings in the event of an "adverse happening." If that is the case, the engine should be placed to one side of the landing zone out of the way of expected approach/departure routes. Firefighters should be in full bunker gear (or aluminumized proximity suits) and positioned with the truck between them and the helicopter to best use the truck as a fire wall and as protection from flying shrapnel. Rapid deployment of foam would be the fire suppression of choice.

It is safest for everyone if all unauthorized personnel, news media and bystanders are kept at least 200' from the helicopter.

After the Helicopter Lands

The following rules are a commonsense approach to helicopter safety:

- Once a helicopter has landed, wait for the rotor speed to slow or stop and for the pilot to signal before anyone approaches the ship.
- Always approach the helicopter in full view of the pilot-between 10 and 2 o'clock of the nose-and always make sure the pilot sees you and waves you forward.
- Keep a crouching, low body profile to advise others that you are aware of the rotor hazard. There is an interesting phenomenon with helicopters known as "flap" or "sail" at warm-up or cool-down rotor speeds, when a sudden wind gust can cause the rotor blades to dip to people level and result in serious injury or death.
- If you have a helmet, secure the chin strap. No other hats should be worn, and nothing loose such as a stethoscope should be worn around your neck.
- Never carry anything overhead, including IV fluids. All long objects should be carried parallel to the ground.
- Always walk, never run, around a helicopter. If the landing zone is uneven, never approach or depart from the uphill side. Always use the downhill side where you are in the pilot's view.
- The tail rotor, which is the helicopter's most serious hazard, is usually somewhere around head level and, when at speed, is almost invisible (with perfect lighting). Since most EMS operations are in less than perfect conditions, the tail rotor cannot be seen.

Never approach a helicopter from the rear. The only exceptions are the BO 105 and the BK 117, which are rear-loading. Never go past the vertical fins and expect to be escorted by the flight crew after they have disembarked.

- Never secure any doors or hatches on the helicopter, since they can be surprisingly fragile and are easily damaged. If they cannot be secured, the helicopter cannot fly. Only the air crew should secure anything on the helicopter.

Lift-Off and Departure

The landing zone coordinator will notify the pilot when the landing zone is clear of all ground personnel. Maintain all protective devices against flying debris. If at all possible, try to maintain a secure landing zone with all personnel and emergency equipment for 5 minutes after the helicopter departs. If an in-flight emergency develops, this will allow the pilot to return safely to a secure landing zone.

Hopefully, this article is a review for most readers. If it contains new information for you, please contact your local aeromedical service to see about enrolling in their ground safety courses.