Temporary Helicopter Landing Zone Identification

The success of emergency helicopter missions can be compromised if the temporary landing zone is not properly marked.

As the helicopter settled to the ground all hell broke loose. Barricades that had been set up by the fire department, even those some distance away, were blown over by the prop wash. Some ended up yards away from the landing zone. Dust from the landing area rose; bystanders grabbed their hats and held their coats closed. Fortunately, flying debris didn't strike any of the spectators.

Typical of a landing zone? Sometimes inappropriate devices are used to "help" guide a pilot to a safe landing. Pilots report a variety of devices used to mark landing zones: white towels laid on the grass in a circle; traffic barricades from fire, police or public works; railroad flares, or zylume fluorescent sticks, etc.

Occasionally, an emergency may dictate unusual landing conditions for the helicopter. Fire departments are sometimes called out to assist the landing and to provide emergency equipment at the site in the event of a landing or take-off accident. Police departments may already be at the site of an emergency to provide extra personnel and cars to illuminate the landing site at night.

Some jurisdictions have regulations stipulating that only fire departments may assist such a landing or take-off. Legal liability for the assistance rendered may dictate such regulations.

- Many times pilots have reported that too many vehicles at a landing site confuse the exact location of the landing zone. So many headlights and rotating beacons illuminate the area that the pilot has difficulty distinguishing the touch down zone.
- Do not use the following items to identify a safe landing zone:
- Open flame such as railroad flares, torches, etc.
- Fire/police/public works barricades and/or plastic traffic cones
- Any other markers that could be blown up into the helicopter rotors or sucked into the engine intakes
- multiple rotating flashing lights on vehicles
- Flashlights/spotlights aimed up at the helicopter

Open flames such as flares and torches at the landing site tend to start brush fires and create additional hazards, not only for the helicopter but also the department assisting with the landing. Pilots indicate that the intense light emitted by flares sometimes causes vision problems.

One pilot reported a particularly frightening incident at a landing site marked by railroad flares. After exiting his craft he encountered a member of his ground crew with a burning flare stabbed into his jacket - the prop wash had whipped it up from the ground.

Marking a landing zone with open flames evokes even stronger objections from pilots with liquid oxygen on board. Because constant venting of the oxygen pressure causes vapor to escape from the tank, these aircraft are especially vulnerable to fire hazard.

Loose objects in or near the landing zone can be swept up in the prop wash and sucked into the engine intakes or into the rotors. Always clear landing sites of such objects. If they are necessary at the site, they must be placed so as to avoid the effects of the prop wash or secured so as to not create a hazard.

Night vision is a topic frequently brought up by pilots and others concerned with safe landings at night. It is widely known that night vision is affected by bright lights (flashlights, flood lights, railroad flares, etc.). It may not be well known that studies have shown it takes as much as an hour in complete darkness before the eyes form effective night vision. After that, sudden exposure to bright lights eliminates night vision - another period of adjustment is required before true night vision returns.

Controlling sudden light flashes into the eyes of pilots will preserve their ability to distinguish objects and terrain at the landing zone.

Because of the abundance of artificial light in our society, pilots for helicopter operations in most populated areas cannot maintain night vision. For them, night vision is almost never a concern. However, night vision or not, no pilot wants flashlights, spotlights, headlights, revolving lights, etc. aimed toward a helicopter while landing. Flashes of light hitting a pilot's eyes has predictable results...temporary (if just for a few seconds) blindness. Even railroad flares have caused this problem.

Collecting many vehicles around a landing zone may cause trouble too. One pilot reported that he flew right over the selected landing zone because he couldn't tell which sets of revolving lights indicated the landing zone. Many helicopters are equipped with powerful flood lights that the pilot can use if needed. Radio communication with the pilot before landing will reveal his preference for landing zone lighting.

"Preparing a Landing Zone" edited by Jim Whitman, is a booklet published by the National EMS Pilots Association. It can be ordered for a nominal fee by writing to: 35 South Raymond Suite 205, Pasadena, CA 91105 (USA), by calling 818-577-7600, or direct from their web site.

Dealing with wires in the vicinity of the landing site is just one of the pilot's concerns, but it is a serious one. Night landings are the most difficult because wires and other obstacles both in the air and on the ground, become invisible. Wires are difficult to detect even in the best of light conditions. The pilot and crew relies heavily on ground crew effectiveness in locating wires and other obstacles. After a thorough inspection of the selected site has been completed, a radio conversation will properly advise the helicopter crew of the location of hazards.

- Suggestions for an effective emergency marking system for a temporary helicopter landing zone include:
- Use bright lights, not so bright as to blind the pilot, but bright enough to be used during the day (no open flames)
- Select components that will be unaffected by prop wash and gusting winds
- Utilize a system that is easy to deploy, even by one person
- Mark the direction of the wind to help the pilot land into the wind
- Outline the landing zone with one light at each corner to establish a distinctive pattern to the designated landing zone.
- Keep all elements of the emergency marking system in one place for immediate use - preferably in a compact case that will protect the components.

A brief discussion of the use of strobe lights to mark a landing zone would be helpful. Concern has been raised about the possibility that aircraft strobes contribute to vertigo in pilots. Studies have revealed that sunlight streaming through the rotating helicopter blades produces the frequencies of light flashes most likely to cause vertigo in susceptible persons. This is approximately twice the frequency of the specification established for aircraft strobes. Therefore aircraft marking strobe lights continue in use.

Strobe lights produce the most penetrating and distinctive light for marking a landing zone, as long as the size and intensity will not be distracting to the pilo+t.

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LZ Coordinator Responsibilities

Command and secure the LZ
Establish radio contact with aircraft
Assist pilot in locating the LZ
Keep all bystanders 100' away form the LZ
Keep everyone away from the tail rotor
Contact pilot after landing to determine any safety issues

Helicopter Safety

Approach and depart the aircraft from the side only
Never walk around the tail rotor
Shield your eyes from rotorwash during landing and takeoff
Do not carry anything above your head
Do not approach the helicopter while the blades are turning unless instructed by the CareFlite crew
Do not run towards the aircraft, approach in a calm and slow manner
No smoking anywhere in the vicinity of the aircraft
The pilot and/or medical crew control activity around the aircraft
Secure loose items such as hats, clothing, stretcher sheets, and any other object light enough to be blown into the rotor blades