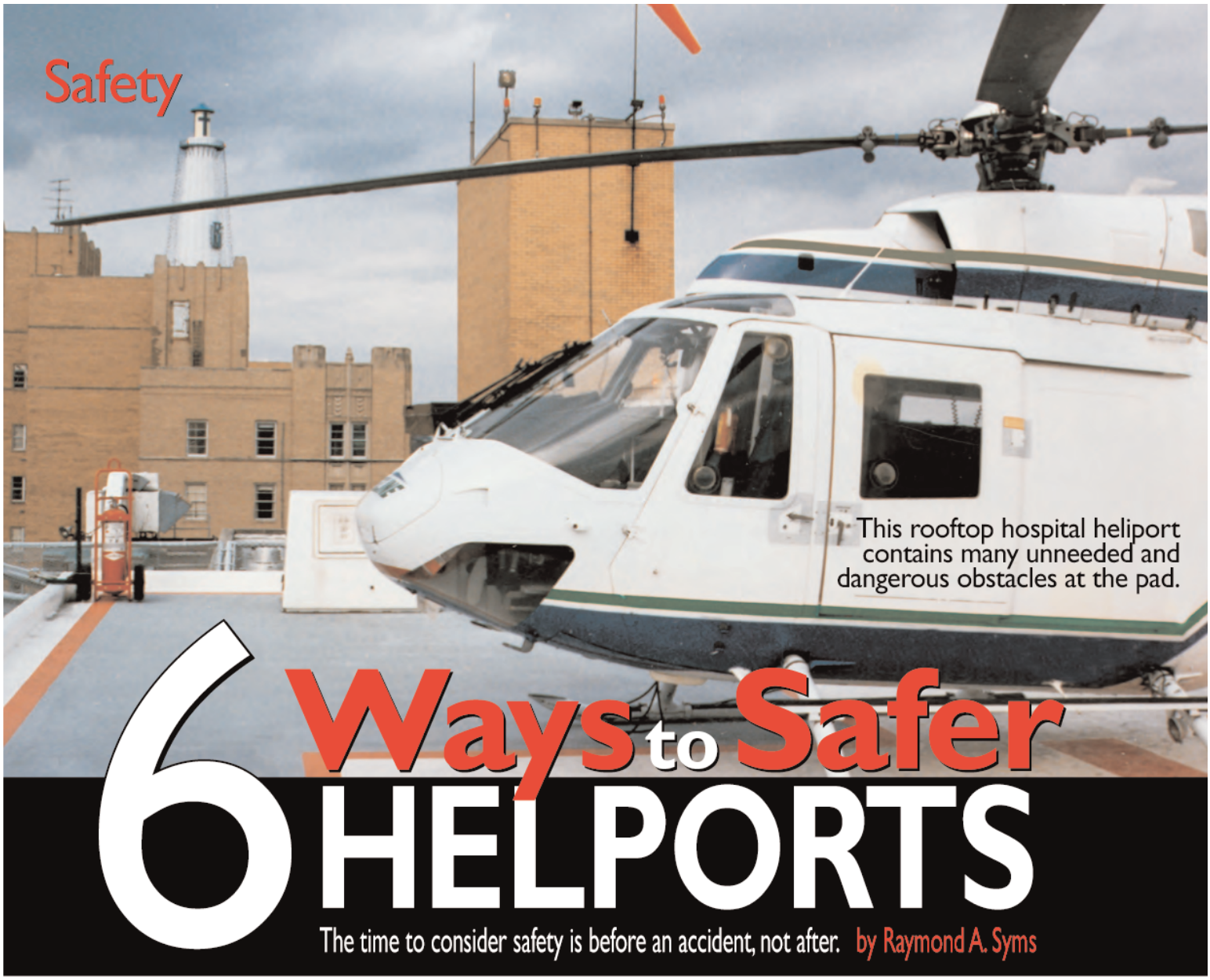

This rooftop hospital heliport contains many unneeded and dangerous obstacles at the pad.

6 Ways to Safer HELPORTS

The time to consider safety is before an accident, not after. by Raymond A. Syms

AN INTEGRAL PART OF A heliport's function must be the enhancement of safety. In this regard, an old saying used by designers—"form follows function"—applies to helicopter infrastructure as well.

Heliport safety is related directly to the design and planning of a heliport. The FAA, Helicopter Association International (HAI) and the American Helicopter Society (AHS) worked together to develop the FAA Advisory Circular (AC) 150/5390-2A, "Heliport Design," in 1994. Although it describes the minimum, not optimum, design standards, it is an excellent safety guideline. Unfortunately, many established heliport facilities do not meet the minimums outlined in the AC.

The AC is not mandatory in the eyes of the FAA, unless federal funding is involved. Also, you may prefer a certified GPS instrument approach. Nonetheless, about half of the states, many local jurisdictions and the U.S. Courts have adopted the AC as the undisputed standard. In all cases, it is highly recommended that heliports follow this publication, regardless of legal requirements, for safety's sake.

There are easily identified hazards in the basic design or operations at heliports that could facilitate an accident under the right set of circumstances. The most common deficiencies fall into six categories: insufficient space; poor surface; inadequate approach/departure paths; wind and turbulence effects; lack of security; and poor training and emergency planning.

Insufficient space

The FAA guidelines, on which most other state and local regulations are based, call for an obstacle-free area, called a Final Approach and Takeoff Area (FATO) of 1.5 times the overall length (OL), plus a safety area one-third the rotor diameter (RD) on each side.

As an example, the area would be just less than 110 feet for an S-76. If the OL is 53 feet, then (OL) x 1.5 = 79.5 feet. RD is 44 feet, so RD divided by three = 14.66 feet. This works out to be 79.5 feet (OL) + 29.32 feet (14.66 feet on both sides) for a total of 108.82 feet. This provides sufficient maneuvering room, free of obstacles that could be struck by the rotors, tail boom, landing gear, and so on.

The most common obstacles found in this area are perimeter lights, fences, floodlights, fire protection and fueling equipment, windsocks, and light poles. All of these objects have been struck by helicopters at one time or another.

Poor surface

A number of dynamic rollover accidents occur due to soft asphalt that can catch a skid or wheel. Irregular heliport touchdown surfaces also have been blamed for such accidents. In order of preference, the best materials are: concrete, concrete pavers, metal surfaces, and stabilized turf.

The key to a safe touchdown area is a relatively smooth and flat area without any irregu-

larities. Ruts, edges of pavement, pavement joints of different heights, irregular metal surfaces, refueling hoses, tow bars and other equipment on the pad all cause problems.

Inadequate approach/ departure paths

The FAA's recommended approach and departure paths are the imaginary ramps into the air that start at the edge of the FATO and proceed upward at an 8:1 slope, expanding evenly in width until they are 500 feet wide at 4,000 feet from the heliport. The 8:1 slope translates to a 12.5-foot height increase for every 100 feet from the FATO.

A hover-hole (a heliport with steep approaches and departures) leaves very little room for options in an emergency. The preferred design is to create two 8:1 approach and departure paths as far apart as possible and relative to the expected winds.

Wind and turbulence effects

A very important element in heliport design and operations is the anticipation of wind and mechanical turbulence effects. All heliports without proper allowance for airflow design—especially rooftops, helipads that are downwind or in the vicinity of other buildings—can give the unwary pilot an unwanted surprise. Wind shear, rotor tip vortices, even 180° shifts in the wind direction are possible. Many hard landings, overtemps and overtorques have been attributed to these factors.

Lack of security

Provisions for securing the heliport must be in place to protect both the public and the helicopter, especially if the helicopter will be left unattended. Properly designed and located pedestrian barriers, such as bushes, flower beds, ground cover and areas that deter passage (such as large rocks, non-obstructing fences, and even a moat) can be very effective. If available, properly trained security personnel can be more valuable than most barriers.

Poor training and emergency planning

Improper passenger handling, coupled with poor security, results in many serious and fatal injuries. Proper training for people who work in the vicinity of an operating helicopter is essential. Posting warning signs and emergency numbers at the heliport can improve safety. Ensuring that the heliport has the proper access to fire protection, drainage, equipment and training is also very important.

Liability is an important issue for non-criteria heliports. If a person is injured or killed at a heliport and there is a direct relationship between the accident and a non-criteria design or operational issue, the heliport, the pilot and the helicopter operator may be found liable for any resulting legal damages.

This is not to say a compliant heliport is a guarantee of security against liability exposure, but compliance eliminates a substantial contributing factor in many heliport accidents.

Proper planning

By designing a helipad according to safe criteria, most accidents can be avoided. Copies of the AC can be obtained directly at www.faa.gov/arp/pdf/5390-2a.pdf or by contacting the airports office at FAA regional headquarters.

Another resource available to aviation professionals for understanding heliport requirements is the Heliport/Vertiport Development Guide published by HAI. It contains a copy of the FAA Heliport AC and a wealth of other information that explains the process of basic heliport design. The guide also contains an excellent training and operations manual for heliports that covers all appropriate areas of knowledge.