AIR OPERATIONS FOR ASRC MEMBERS

INTRODUCTION

In recent years, the ASRC has been involved more and more with aircraft on search and rescue missions. Law enforcement and medical providers are obtaining and using more aircraft and the ASRC frequently works with the Civil Air Patrol so this trend can be expected to continue as aircraft become more available search and rescue resources.

Aircraft are used most commonly in three roles by the ASRC. Transportation to and from distant mission sites is often provided by the CAP in general aviation aircraft or by military helicopters. Medical evacuation from remote areas may be provided by air ambulances operating in Virginia, all capable of providing advanced life support within minutes of being called by searchers, and all working out of major medical centers. Finally, airborne searching or other tactical support may be provided by state police, U.S. Park Police, the military, the Civil Air Patrol, or any one of a number of operators.

Exposure to such a variety of aircraft with increasing frequency requires that Conference members be familiar with safety and operational procedures. Pilots and flight crews will not be able (or willing) to instruct people in such procedures as they are needed and a basic familiarity with them will vastly improve the safety and efficiency of the operation as well as the

searchers' working relationship with the flight crews.

SAFETY

Certainly the most important aspect of any operation is safety. This is also one of the most neglected parts of many search operations using aircraft. Remembering a few guidelines and the proper use of personal safety gear may prevent an accident, however, or save someone's life if one occurs.

Helicopters are often thought to be a great safety hazard because of the perceived consequences of a mechanical failure. Contrary to popular belief, helicopters do not fall out of the sky if their engine

Figure 1. Autorotations

fails.

There is a technique, called autorotation, that allows the pilot to make a safe "hard landing." Autorotation is not possible, however, if the helicopter is operating at low altitude or at a slow airspeed. The exact limits vary from model to model, but typically autorotation is impossible below an altitude of fifty feet above ground level or an airspeed of fifty knots (see fig. 1).

If a hard landing must be made, passengers are safest if they assume a crash position. When warned by the pilot, sit bent forward at the waist, hands clapsed behind the neck. If your seat faces the rear of the ship, sit erect with your head braced firmly against the headrest, arms at your sides. Do not leave the ship until the rotors stop turning unless there is fire. Very few hard landings result in a fire, but if the ship should burn, exit quickly and calmly, head ducked, leaving towards the downhill side of the landing site.

The use of flame-resistant clothing has been shown many times by the military to significantly reduce burns suffered in the initial flash of aircraft crashes. If this flash is sur-

vived, the odds are greatly increased that the crash will be survived. [Essentially, the clothing buys you time to run.] For this reason, most government agencies require the use of certain protective clothing. If a Park Service employee is injured in a crash, for instance, and he was not using all required safety gear, he is not eligible for workman's compensation. For reasons of liability, and more importantly of personal safety, it is therefore unwise to fly in low altitude or slow (i.e. tactically useful) aircraft without using this equipment.

First, a flame-resistant garment should be worn The first choice is a loose fitting flght suit made of Nomex fabric, which will support flame but will not burn once the flame is removed. A two-piece garment is also satisfactory. The suit

should be worn as the outermost layer, and should be long enough to fit over the tops of laced up boots (not low shoes) that are worn with cotton or wool socks. The sleeves should not be rolled up, and should cover the tops of gloves (Nomex or leather). The collar should be turned up to protect the back of the neck. Synthetic materials (polypropylene, nylon, etc.) will support flame and should not be worn, especially not as an outer layer.

If a Nomex garment is not available, cotton and wool are the best substitutes. [Cotton may be made flame resistant by soaking it in a solution of boric acid and allowing it to drip dry; the treatment must be repeated after each washing.] Any clothing should be loose fitting so that air can act as an insulator against the intense heat.

A flight helmet is also desirable. It will provide good protection against burns for almost all of the head if always worn with the visor down (when the visor is lowered, do not tighten the locknut). The nape strap should be tightened and the chin strap secured snugly on the lowest snaps. Most flight helmets also provide hearing protection and may be equipped with electronics that can be plugged into a handheld radio or an aircraft's communications system. If a

Figure 2. Flight helmet

flight helmet is unavailable, any other type of helmet with a chin strap should be worn along with eye protection and ear plugs.

Survival items (essentials) should be carried at all times in case an emergency landing must be made in a remote area or under adverse conditions. When flying on a search as an observer, a searcher should carry his field pack if weight restrictions allow in case the need arises to land and follow up an observation on the ground.

Because of the altitude and airspeed limitations on autorotations, take-off and landing are the least safe times in the flight. For this reason, any persons working in the landing zone should wear the same safety gear they would if they were flying. Non-essential personnel should be kept outside of the safety circle of the helispot and well clear of the approach and departure paths (it is illegal for these paths to pass over people, buildings, or vehicles at an altitue or separation less than 500 feet).

It is the responsibility of the helispot manager to see that these guidelines are followed and that all passengers that board a helicopter are briefed on emergency procedures, provided with safety gear, and properly loaded and strapped into the aircraft. He should prepare a manifest of each flight, containing at least the name and emergency contact for each passenger. He is also responsible for the safety and security of the helispot.

GROUND OPERATIONS FOR AIRCRAFT

The ground activities accompanying air operations may be quite simple or complex. Most pilots can operate around a landing zone without any ground direction. Communicating as much information about the landing zone and its hazard to the pilot as is possible can only improve the safety of the operation, however.

Much of this information can be communicated by the proper design of the helispot.

Helicopter landing zones should consist of a square touchdown pad located in the center of a safety circle. The sizes of the pad and circle vary for different helicopters. The Incident Command System has terminology that recognizes three size classes of helicopters and describes the landing zones for each (fig. 3). A clear path should exist in the direction of take off for ideally three hundred feet and in the

direction of landing approach for at least one hundred feet.

Figure 3. ICS Helispots

The paths should extend from the center of the touchdown pad at about twenty degrees and should clear about twenty degrees

vertically.

The landing zone should be as clear as possible of any hazards. A special effort should be made to avoid power lines. Difficult to see from the air, they can tangle or destroy the rotors of a helicopter. Also hazardous is the presence of boggy ground around the touchdown pad. If the ground is not solid and no other helispot is available, the site may be rendered safe by placing logs parallel to and against one another, holding them in place with stakes driven in the ground.

If the windspeed is greater than ten knots, the helicopter will need to land and take off into the wind. If winds are steadily twenty knots or greater, the landing zone will probably not be useable by most smaller aircraft. To indicate the wind direction, a wind tee, made from orange or white signal panels seven by one and a half feet in size, should be placed on the touch down pad with the top of the "T" pointing into the wind.

Small smoke bombs can be used to identify the helispot and to indicate wind direction and speed. Signal panels should be sturdily secured since they will be subjected to extremely high winds as the rotor downwash hits them. If not secured, they can be caught in the circular air flow set up by the rotors and can foul or break the rotor or air intake, creating an extremely dangerous situation.

At night the helispot can be illuminated by strategically positioning vehicles around the safety circle with their low-beam

headlights shining towards the touchdown pad. The wind "T" may be illuminated, but if lights (e.g. steadily burning highway warning lights) are used they should be well secured. The aircraft may be signalled using meteor flares, strobes, or the rotating

beacons of emergency vehicles. No light should be pointed directly at the ship, however weak; it may temporarily blind the pilot (no flash pictures!).

Figure 4. Night Operations

Hazards can be marked with red highway flares and should be described to the pilot by radio if posible.

Any loose objects around the helispot should be secured. Persons within the safety circle should wear hemmets with chin straps. Shirt tails should be tucked in, shoe laces tied, and hats and other loose items removed or secured.

The helispot manager should appoint or serve as a signalman, using hand signals (fig. 5) to move the helicopter to the flat-test, most solid part of the touchdown pad well clear of any hazards. The signalman should position himself outside the main

rotor diameter to the right front of the helicopter (helicopter pilots sit on the right). It should be remembered that any signals are only advisory; the pilot himself has the ultimate decision about positioning the ship in the landing zone.

After it has landed, the helicopter should be approached from the front, within view of the pilot, and only with the pilot's permission. Never approach from the uphill side, where rotors are much closer to the ground. Persons approaching the helicopter should crouch since a sudden downdraft can bring the rotor tips within three feet of level ground. Any long objects (antennae, I.V. poles, tracking sticks, etc.) should be carried paralel to the ground.

ASRC ground teams may communicate with helicopters by several radio channels. There are several aircraft band radios in the Conference, and 122.9 (MULTICOM) or 123.1 (SAR) MHz A.M. are frequencies which might be used. In addition, many law enforcement and medical aircraft are equipped with Wulfsberg radios which may be used to dial up any of the ASRC's primary F.M. frequencies. If one of these should be used, the aircraft dispatcher should be given the frequency when the request for the aircraft is made. Whatever frequency is chosen should be used exclusively for air/ground communication. If more than one aircraft is being used on an operation, an air-to-air frequency should also be established so that pilots might keep aware of one another's positions.

DEPLOYMENT

Aircraft have many uses in SAR operations, many already alluded to above. When requesting airborne support, overhead team personnel should carefully consider their needs and make their request for the safest most efficient aircraft that can do the job (although often one must take what one can get). For example, if all that is required is an airborne platform for a communicatins relay, an orbiting small fixed-wing aircraft sould be far less expensive than a helicopter to operate, and probably more readily available. For low altitude searching, on the other hand, a slow moving helicopter would be a much better choice.

When selecting searchers to act as airborne observers on flights, people with several qualifications should be sought. Searchers that have flown before in the type of aircraft to be used are preferred since their familiarity with the aircraft will make the flight safer and since they will be less distracted from their search task by the routine parts of the flight which may be new to them. Observers should also be familiar with the strategy and development of the search so that they can recognize how heavily certain areas must or must not be covered and what areas should be reconnoitered for expansion of the search effort. Observers should be familiar with aircraft communications procedures since they may be the ones responsible for communicating with the base. Familiarity with aircraft safety should also be a selecting factor.

When flying as an observer, a searcher should keep a

topographic map where it can be quickly referenced and should keep track of where he is at any time so that any observations can be properly documented. The observer should not stare at any one point while flying, but should scan the field of view from side to side and from near to far. Rather than trying to spot anything specific, the observer should look for anything that moves or stands out from the background. If a sighting is made, immediately locate it in reference to some fixed landmark so that the site can be easily located again if a turn of the aircraft places it out of view. If it can be safely done, the observations should be flown 100 to 200 feet above ground level.

If any operation is going to involve significant air traffic, restricted airspace can be requested from the Federal Aviation Administration. This request can be made by contacting an FAA regional office, and should be made by the responsible agent. If granted, the restriction will cover airspace below a certain altitude and within a given distance of a given point. If a restriction is obtained, searchers should be briefed on the situation and should report to the air operations director the

N-number of any aircraft which violate the airspace so that they may be reported to the FAA.

IN SUMMARY

Air operations are becoming more common on ASRC searches. Because aircraft draw attention to the search and specifically to the landing zones in use, and because most ASRC personnel are not

familiar with aircraft operations, safety should be a major concern of incident and helispot managers. Proper safety gear including flame-resistant clothing, gloves, helmets, and eye and ear protection used with proper training can greatly increase the survivability of a crash and can prevent safety hazards in routine operations.

Landing zones should be designated and managed with safety in mind. Providing for this safety is primarily the responsibility of the helispot manager.

Aircraft can be a valuable tool in searching, but the type of aircraft used should be selected with safety and efficiency in mind. Observers should be trained and experienced, when possible.