

## CHAPTER 3

# SETUP AND CONTROL OF MEDICAL EVACUATION (MEDEVAC)

Medical evacuation and casualty care are responsibilities shared by everyone involved with command and control activities. All personnel assigned to the unit must be aware of casualty facilities and medical evacuation procedures (MEDEVAC). A well-developed MEDEVAC plan will not only save lives but will also ensure the unit is ready for present and future missions. The loss of any Seabee because of a poor MEDEVAC plan is inexcusable and can result in a disastrous lack of firepower when it is most needed. This chapter covers in depth the setting up of a landing zone, the landing zone brief, the medical evacuation request, and the medical evacuation procedures.

### LANDING ZONE/SITE/POINTS

A helicopter landing zone (LZ) is a specified ground for landing helicopters to embark or disembark troops or cargo. A landing zone is designated by a code name. It may include one or more landing sites.

Depending upon the terrain and the size of the Seabee unit, you can divide the LZ into several **landing sites**. A landing site is a specific location within a landing zone in which a single flight of helicopters may land to embark or disembark troops or cargo. Landing sites are designated by color, such as landing site red. A landing site contains one or more landing points (fig. 3-1).

A helicopter landing point is an area within a landing site where an individual helicopter can land. Landing points are designated by two-digit numbers, such as landing point 12. For pathfinder purposes, the landing points are identified by the use of smoke or air panels. For night operations, you can mark the landing points with some type of low-intensity light. A general **rule** is to position landing points ten times as far from an obstacle as the obstacle is high (10:1 ratio).

**NOTE:** In most cases, a Seabee unit will be required to construct a landing zone with one landing

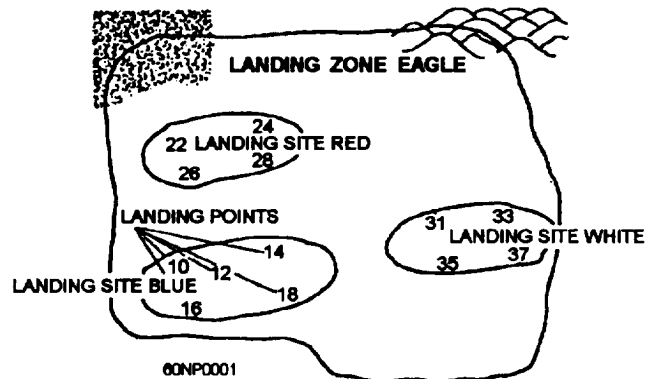


Figure 3-1.—Helicopter landing zone (LZ).

site and one landing point for resupplies, troop movement, or medical evacuations.

### PREPARATION OF THE LANDING ZONE

When planning the preparation of an LZ, you should take several factors into consideration. First, you should know what type of helicopters will be using the landing zone. The Combat Operation Center (COC) can provide this type of information. Second, you must consider the Seabee unit's position in relation to the enemy. Security troops must establish a 360-degree perimeter around the landing zone to defend the LZ. A third factor is the time it will take to prepare the landing zone. And a fourth factor considered is the equipment needed to prepare the LZ.

### Approaches and Exits

The ground approaches to the LZ and exits from the LZ must be free of major obstacles that might obstruct landing or takeoffs, such as tall trees, telephone poles, or power lines. Approaches and exits should also be clear of obstructions that are 10 meters or higher, extending at least 50 meters in the direction of approach and exit paths. The rule of thumb for determining the distance required between the landing point and a high obstruction is a 10:1 ratio. This

means that the distance a landing point is located from a tree is ten times the height of the tree.

**Example:** A helicopter landing or taking off near a 30-foot tree needs at least 300 feet of horizontal clearance (fig. 3-2).

### Ground Obstacles

Obstacles on the ground, such as stumps or rocks, should not exceed 1 foot in height on level ground and should be less on sloping ground.

### Gradient (Slopes)

Ground slope has a considerable effect on selecting a landing site or landing point within the LZ. A helicopter cannot land safely in locations where the ground slopes more than 14 degrees. When pilots land on a slope, they prefer to land uphill because of the tail down attitude of the helicopter.

### Surface Conditions

Mud, excessive dust, and loose debris are considered undesirable surface conditions for helicopters. Mud causes a helicopter to become bogged down. Excessive dust reduces visibility and compromises the location of the site. Loose debris is dangerous because they are sucked up into the rotor

blades or turbine intakes, causing serious damage. Shallow water, less than 18 inches deep and with a firm bottom, can be used as a landing site.

### Winds

When the wind at ground level exceeds 10 knots, the helicopter must land into the wind.

### LANDING SITE DIMENSIONS

Landing site dimensions vary, depending on the number of landing points required. For each landing point, a fuselage safe circle is cleared of all obstacles, such as stumps, rocks, or bushes. Clear a rotor safe circle of all obstacles that could obstruct the rotor blades (fig. 3-3).

When there is to be more than one landing point within the landing site, separate the landing points so the helicopters can simultaneously land safely in the landing site. Use figure 3-4 as a guide in selecting the appropriate size landing zone.

### MARKING THE LANDING ZONE

Once you have established the LZ, the landing sites, and the landing points, you need to direct the helicopter to the location of the LZ. The proper marking of the LZ will aid the pilot in locating it.



Figure 3-2.—Horizontal clearance.

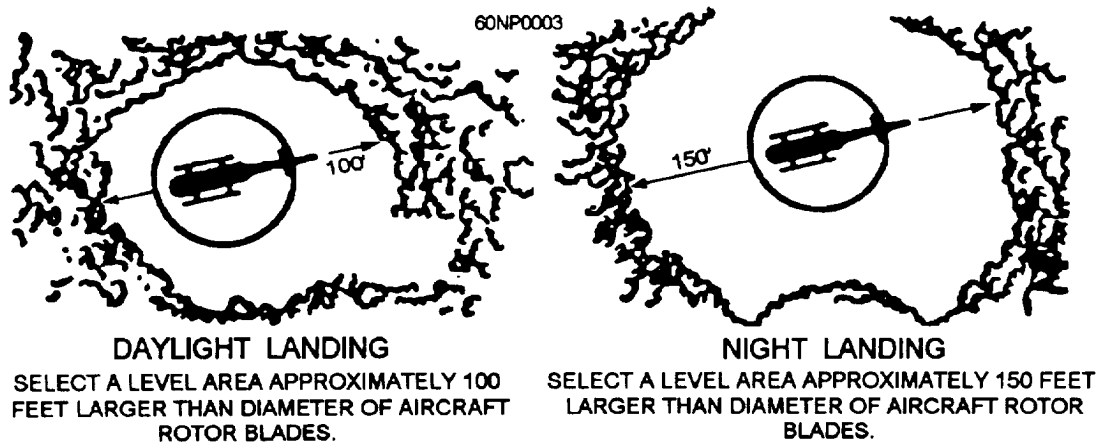


Figure 3-3.—Landing point dimensions.

TYPE	OVERALL LENGTH (FEET)	LANDING ZONE DIAMETER OBSTRUCTION HEIGHT (FLEET)		
		5-40	40-80	80-
UH-1E/N	57/57	100	150	200
AH-1G/J	53/53	100	150	200
AH-1T	58	100	150	200
CH-46	84	175	250	350
CH-53	89*	175	250	350

\*CH-53E length is 99

Figure 3-4.—Landing zone diameter.

Recommendations for marking an LZ and for guiding a helicopter to an LZ are as follows:

1. **Daylight landing:** The landing zone is equipped with a means of showing wind direction and velocity. This is usually accomplished by the use of smoke or by verbal radio message. Expedient methods for determining wind direction and velocity are as follows:

a. **Grass drop method.** Extend your arm straight out and drop the grass from your hand. Point the extended arm at the dropped grass on the ground. The angle between the arm and the body divided by four is the wind velocity in knots.

b. **Angle of smoke method.** Observe the angle at which smoke blows. The wind speed is as follows:

- If smoke goes straight up, no wind.
- If smoke blows at a 30-degree angle, wind is 3-5 knots.
- If smoke blows at a 60-degree angle, wind is 5-7 knots.
- If smoke blows along the ground, wind exceeds 8 knots.

Use smoke and landing zone panels to mark a landing zone by day. Both should be the same color as the designation of the landing zone. This will aid the pilot in locating the landing zone. Mark obstacles that cannot be removed within the landing zone with single red panels staked to prevent uprooting by rotor wash.

**SECURITY CAUTION:** If smoke is used to mark the landing zone, use only as needed and do not tell the pilot the color of smoke; ask the pilot to acknowledge the color after the smoke grenade is set off.

2. **Night landing:** The organization and use of an LZ at night or during periods of low visibility is more complex compared to daytime operations. Special lighting equipment or field expedients as required.

a. You must indicate outlines of landing zones by low-intensity markers.

b. You must show obstacles near the landing zone by low-intensity markers or voice radio instructions.

Another method of guiding the aircraft to the zone is vector instructions. This is simply relaying instructions to the pilot by radio. For example, the radio operator spots the helicopter. Using a compass, the radio operator shoots an azimuth of 135 degrees from the LZ to the helicopter and quickly computes a back azimuth of 315 degrees. The radio operator then transmits the following message:

“HOME WISH, THIS IS FLIGHT BEE . . . VECTOR THREE ONE FIVE TO LANDING ZONE HAWK . . . OVER.”

The pilot then acknowledges the message and takes up the correct heading of 315 degrees. The term *vector* is always used in a situation like this to prevent misunderstanding. As the helicopter approaches, minor corrections will probably be necessary. These are given as corrections to the original heading by the following:

“HOME WISH, THIS IS FLIGHT BEE. . . COME RIGHT FIVE DEGREES OF PRESENT COURSE. . . OVER.”

When the tactical situation does not allow the use of a compass, you can vector the helicopter to an LZ by using the clock system:

“HOME WISH, THIS IS FLIGHT BEE . . . MY POSITION IS AT YOUR NINE O’CLOCK . . . OVER.”

The aircraft would then execute a 90-degree turn to the left.

## LANDING SIGNALMAN ENLISTED (LSE) SIGNALS

Once the pilot has located the LZ, you can now help the pilot land the helicopter. These signals are visual arm-and-hand signals used by personnel to “talk” to the pilot of the landing helicopter. The confidence of the pilot in the LSE’s signals depends on the precise manner in which the LSE gives the signal. Movements are sharp and precise. LSE’s signals are executed exactly as prescribed. The LSE must always remain alert for signals from the pilot. During night operations, LSEs must use illuminated wands. During a landing approach, the LSE’s functions areas follows:

1. Inform the pilot of the approaching helicopter that you are the LSE. You do this by means of the Prepare for Guidance signal.

2. Indicate the landing point to the pilot by positioning yourself 25 meters in front of and 10 meters to the right of the landing point as the pilot looks at it.

3. Aid the pilot in landing safely on the landing point. The pilot is responsible for the approach and landing of the helicopter. However, the pilot relies heavily on the LSE to provide warning of conditions of which he or she is not aware of and to direct the helicopter to a safe landing point.

4. The only signal that the LSE must give to the pilot on the deck is the Wave-Off signal. All other signals are advisory signals to the pilot. The decision to accept or reject the signal is solely the responsibility of the pilot. Responsibility for the safety of the aircraft can never be relinquished to the LSE. The Wave-Off signal is given when it is not safe for the helicopter to land.

5. Indicate to the pilot when it is safe to take off.

**NOTE:** Figures 3-5 through 3-14 are Initial Terminal Guidance LSE signals that are standard throughout the Marine Corps. Any misunderstandings that may arise about signals are clarified by close coordination with the supporting helicopter unit. The signals are used for daytime operations. Signals given at night are executed in the same manner except that an illuminated amber director’s wand (Chem Lite) is held in each hand.



Figure 3-5.—Prepare for guidance.



Figure 3-6.—Forward.



Figure 3-7.—Backward.

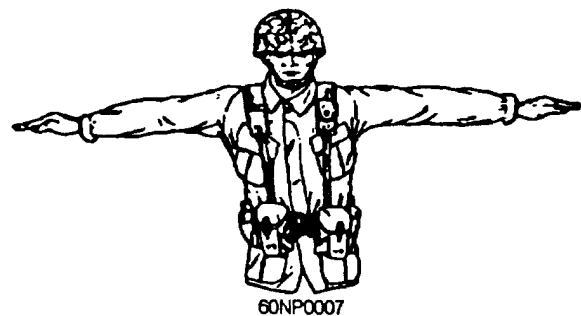
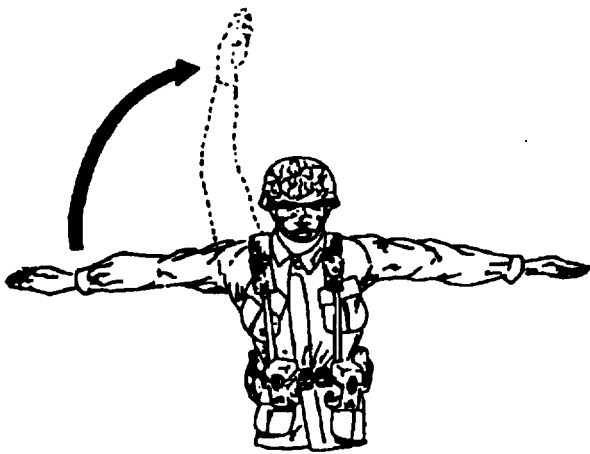
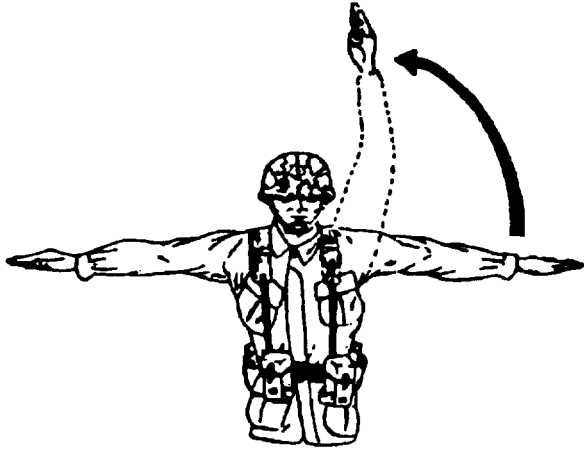


Figure 3-8.—Hover.



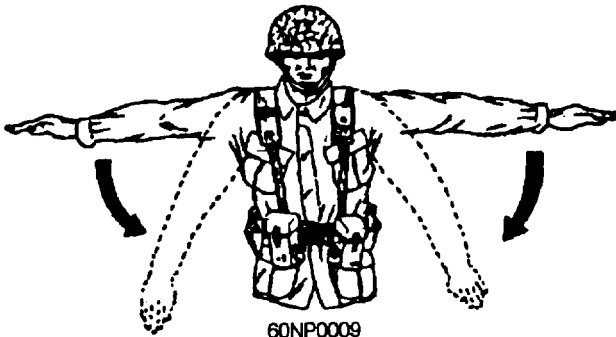
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Figure 3-9.—Move right/left.



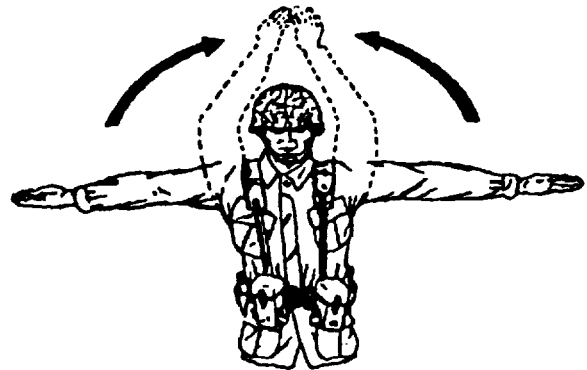
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Figure 3-10.—Downward.



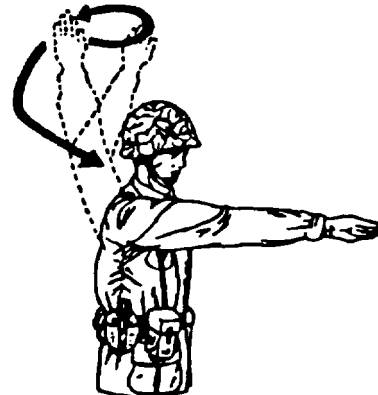
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Figure 3-11.—Land.



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Figure 3-12.—Upward.



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Figure 3-13.—Takeoff.



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Figure 3-14.—Wave-off.

### LANDING ZONE BRIEF

When a helicopter has to land for troop pickup/drop, resupply, MEDEVAC, or for any other reason, the pilot must have certain information to ensure a safe landing. This information is provided in a landing zone brief (fig. 3-15).

LANDING ZONE BRIEF	
1. MISSION NO.	_____
2. LOCATION COOR/RAD/DME	_____
3. UNIT CALL SIGN	_____
4. FREQUENCY	PRI UHF ___ FM _____ SEC UHF ___ FM _____
5. LZ MARKING	_____
6. WIND DIRECTION/VELOCITY	_____ / _____
7. ELEVATION/SIZE	_____ / _____
8. OBSTACLES	_____
9. FRIENDLY POSITIONS: DIRECTION/DISTANCE	_____ / _____
10. ENEMY POSITIONS: DIRECTION/DISTANCE	_____ / _____
11. LAST FIRE RECEIVED: TIME/TYPE	_____ / _____
12. DIRECTION OF FIRE/DISTANCE	_____ / _____
13. CLEARANCE TO FIRE: DIRECTION/DISTANCE	_____ / _____
14. APPROACH/RETIREMENT (RECOMMENDED)	_____ / _____
15. PERSONNEL/EQUIPMENT	_____ / _____
16. OTHER	_____

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Figure 3-15.—Landing zone brief.

Each line of the landing zone brief is explained below.

**Line 1:** The mission number will be assigned to the pilot by Direct Air Support Center (DASC) personnel. Under normal circumstance this line is not used by Seabee units.

**Line 2:** Give at least a six-digit grid to identify the location of the LZ.

**Line 3:** Your call sign.

**Line 4:** Self-explanatory.

**Line 5:** List the methods of marking the LZ. For example, smoke, air panels, signal mirrors, lights, and so forth.

**Line 6:** State the direction from which the wind is coming and the wind speed if known.

**Line 7:** State the elevation of the LZ (air is thinner at higher altitudes) and the size of the LZ.

- Line 8:** An obstacle is anything higher or deeper than 1 foot on the LZ or anything near the LZ that may create a hazard to the aircraft. Explain where the obstacles are in relation to the LZ.
- Line 9:** State where friendly troops are in relation to the LZ.
- Line 10:** State the location of the enemy in relation to the LZ.
- Line 11:** Self-explanatory.
- Line 12:** Self-explanatory.
- Line 13:** State the direction and distance the helicopter can fire without endangering friendly troops.
- Line 14:** If possible, the approach heading should be into the wind. The retirement or departure should be clear of enemy positions.
- Line 15:** The different helicopters used for MEDEVAC operations vary in the number of personnel and equipment they can transport. Increased elevation and temperature decrease the weight capacity of a helicopter. A helicopter pilot must know exactly the number of personnel and what type of equipment is to be transported.
- Line 16:** Anything not previously mentioned that could help the pilot in anyway.

### **MEDICAL EVACUATION REQUEST (MEDEVAC)**

A MEDEVAC request contains all the information that Direct Air Support Center (DASC) personnel need to dispatch a helicopter to your position. In a combat situation, the Combat Operation Center (COC) routes the request from the battalion aid station to higher headquarters. Higher headquarters will route the request to DASC personnel. In extreme situations where communication to the COC or the battalion aid station is interrupted, platoon commanders or company commanders should have the knowledge and capabilities to request a MEDEVAC. The operation plan (OPLAN) will explain the routing of a MEDEVAC request. A MEDEVAC request does not actually bring the helicopter to the LZ. The request simply identifies the requesting unit, location of the LZ, and describes the casualty. The DASC will make the necessary arrangements/decisions concerning the MEDEVAC

request. The format in figure 3-17 contains all the information required in a MEDEVAC request. The format may change slightly at different organizations.

### **MEDEVAC PROCEDURES**

The importance of a well-thought-out MEDEVAC plan cannot be emphasized enough. The lives of everyone in the unit depend on it. All personnel assigned to the unit must know the MEDEVAC procedures. The elements requiring special consideration are litter bearers, ambulance, battalion aid station, and LZ security.

### **LITTER BEARERS**

Litter bearers should be personnel, such as messcooks, personnelmen, and yeomen, from Headquarters Company. The litter bearers are assigned as stretcher teams with the COC being the prime coordinator for their utilization. The COC will inform the battalion aid station for their assistance. Many variations occur however, and it must be emphasized that this source of litter bearers is not taken for granted. Platoon commanders and the company chief must be assured of an adequate number of litter teams. Eight men per company are considered adequate unless mass casualties are anticipated. Other sources of litter bearers are as follows:

1. Members of the platoon. This source is mentioned only to be discouraged, although it will be well recognized that in an emergency this may be the only source available. Utilization of platoon personnel manning the defensive lines or FEBA may result in a disastrous lack of fire power when it is most needed for defense.

2. Members of the reserve platoon. Here again it is recognized that in an emergency, this source must be used. However, to rely on this source is not a good practice because the reserve platoon is critically needed during a heavy attack; therefore, if the platoon is used for casualty evacuation, the company commander may be caught shorthanded.

When a casualty occurs, the wounded person, if possible, should go to a relatively protected location away from the defensive lines or FEBA. The word is then quietly passed to the CP for a corpsman or litter bearer. The CP will then inform the COC for action. Passing the word back quietly and expeditiously is important. Loud shouting for a

corpsman by all the troops in the vicinity can have a demoralizing effect on other troops. Incidents have occurred when inexperienced troops have panicked because of frenzied shouting of the whole squad for a corpsman to take care of a single casualty.

Litter bearers are vital for the survival of a casualty, in the maintenance of good morale, and most of all to prevent loss of firepower for the defending platoons. For these reasons, it is vital that provisions for litter bearers be included in the MEDEVAC plan.

<b>SAMPLE LANDING ZONE BRIEF</b>									
<b>TRANSMISSION ITEM</b>	<b>YOU SAY</b>								
<b>1. MISSION NUMBER</b>	<i>(Provided by higher authority)</i>								
<b>2. LOCATION: COOR/RAD/DME</b>	<i>Grid 456129</i>								
<b>3. UNIT CALL SIGN</b>	<i>A4F</i>								
<b>4. FREQUENCY</b>	<i>Primary FM 30.50, Secondary FM 45.10</i>								
<b>*5. LANDING ZONE MARKING</b>	<i>Signal Mirror, Air Panels</i>								
<b>**6. WIND DIRECTION/VELOCITY</b>	<i>Wind From East at 15 Knots</i>								
<b>7. ELEVATION/SIZE</b>	<i>Elevation 2,500 Feet Size 180 Feet in Diameter</i>								
<b>8. OBSTACLES</b>	<i>40 Foot Tree 90 Meters South of Landing Zone</i>								
<b>9. FRIENDLY POSITIONS: DIRECTION/DISTANCE</b>	<i>Friendlys Southeast 100 Meters</i>								
<b>10. ENEMY POSITIONS: DIRECTION/DISTANCE</b>	<i>Enemy Southeast 500 Meters</i>								
<b>11. LAST FIRE RECEIVED</b>	<i>1800, Small Arms</i>								
<b>12. DIRECTION OF FIRE/ DISTANCE</b>	<i>Enemy Fire From Southeast 500 Meters</i>								
<b>13. CLEARANCE TO FIRE; DIRECTION/DISTANCE</b>	<i>South and Southeast 150 Meters From Landing Zone</i>								
<b>14. APPROACH/RETIREMENT (RECOMMENDED)</b>	<i>Approach Heading 90° Return Heading 350°</i>								
<b>15. PERSONNEL/EQUIPMENT</b>	<i>Six Personnel with Alice Packs &amp; Rifles</i>								
<b>16. OTHER</b>	<i>5° Slope</i>								
<p><b>* CAUTION:</b> As a security caution, if you use smoke to mark landing zone, DO NOT tell pilot what color smoke will be. Ask pilot to acknowledge color after grenade is set off.</p> <p><b>** Determine and report wind condition and direction:</b></p> <p>For angle of smoke method, observe smoke blowing if the wind is blowing.</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tbody> <tr> <td><b>SMOKE STRAIGHT UP</b></td> <td><b>NO WIND</b></td> </tr> <tr> <td><b>SMOKE 30°</b></td> <td><b>WIND AT 3-5 KNOTS</b></td> </tr> <tr> <td><b>SMOKE 60°</b></td> <td><b>WIND AT 5-7 KNOTS</b></td> </tr> <tr> <td><b>SMOKE ALONG GROUND</b></td> <td><b>WIND IN EXCESS OF 8 KNOTS</b></td> </tr> </tbody> </table>		<b>SMOKE STRAIGHT UP</b>	<b>NO WIND</b>	<b>SMOKE 30°</b>	<b>WIND AT 3-5 KNOTS</b>	<b>SMOKE 60°</b>	<b>WIND AT 5-7 KNOTS</b>	<b>SMOKE ALONG GROUND</b>	<b>WIND IN EXCESS OF 8 KNOTS</b>
<b>SMOKE STRAIGHT UP</b>	<b>NO WIND</b>								
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<b>SMOKE 60°</b>	<b>WIND AT 5-7 KNOTS</b>								
<b>SMOKE ALONG GROUND</b>	<b>WIND IN EXCESS OF 8 KNOTS</b>								

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Figure 3-16.—Sample of landing zone brief.

## MEDEVAC REQUEST

Mission # \_\_\_\_\_

1. Emergency \_\_\_\_\_ Priority \_\_\_\_\_ Routine \_\_\_\_\_
2. Requesting until call sign
3. Date-time group
4. LZ or pickup coordinates (clear)
5. Number of WIA \_\_\_\_\_ KIA \_\_\_\_\_ SICK \_\_\_\_\_ OTHER \_\_\_\_\_
6. Pickup of doctor or corpsman at LZ or Coord
7. Airborne medical assistance required yes \_\_\_\_\_ no \_\_\_\_\_
8. LZ is marked with Smoke \_\_\_\_\_ Panels \_\_\_\_\_ Light \_\_\_\_\_ Strobe \_\_\_\_\_
9. LZ Freq Designator \_\_\_\_\_ Call Sign \_\_\_\_\_
10. Remarks: Need jungle penetrator?

\* Casualty report must follow this request.  
DASC is informed when MEDEVAC is completed.

Figure 3-17.—MEDEVAC request.

### **AMBULANCE**

An ambulance is normally stationed at the battalion aid station (BAS) and functions as far forward as the terrain and enemy activity permits. The ambulance is primarily used to prevent the prolonged carrying of litters. When the ambulance is called forward, explicit instructions are given as to routes taken and the exact location to which it is to go. Ambulances frequently draw enemy mortar and artillery fire; therefore, they should not be brought up to an area under direct observation of the enemy.

### **BATTALION AID STATION**

The battalion aid station is the central location that all casualties are taken to before any type of evacuation. Medical staff personnel are the only personnel qualified in determining whether a casualty must be evacuated (commonly referred to by the term

*MEDEVACed*). Other functions of the battalion aid station are to give further first aid, check for continued hemorrhage, rebandage where needed, and apply splints if needed. Seriously wounded casualties are given supportive therapy for shock in the form of plasma and serum albumen in preparation of a MEDEVAC. Once the medical staff has determined the priority of the casualties requiring a MEDEVAC and those not expected to survive the flight, the COC is contacted and sends a MEDEVAC request to higher authority. It is recommended that the chaplain is available for those not expected to survive.

### **SECURITY**

Once the MEDEVAC request has been sent to higher authority, the COC will quickly activate the security team. The security team (React Force) is responsible for securing the LZ, establishing communication, landing, and assisting the loading of

the helicopter. Also controlled by the security team is the staging area for those requiring MEDVAC. A member of the security team is established as a "Pit Boss" that will control the litter bearers and all movement of the wounded to the LZ.

### **Securing the LZ**

Weapons and personnel required to secure an LZ are dictated by the size and terrain of the LZ. A 360-degree perimeter must be established around the LZ. All likely avenues of approach and sectors of fire must be covered. Helicopter pilots will not land if they feel the LZ is not properly secured.

### **Establishing Communication**

Simultaneously, communication personnel assigned to the security team will establish communication at the landing site. It is important that communication personnel know the proper mission frequency for contacting the pilot and keeping in contact with the COC. The type of communication equipment needed depends on the terrain of the LZ. Usually, two PRC 119As that are equipped with a AS-3683 10-foot whip antenna are used. Two radios are required because communication must be maintained with both the pilot and the COC.

### **Casualties**

Once the LZ has been secured, casualties are transported from the battalion aid station to the landing point by any means necessary. The casualties are arranged in priorities and according to the capacity of the helicopter.

When en route to the LZ, the helicopter pilot should inform the communicator at the LZ of the capacity of the helicopter and if a corpsman is onboard the helicopter. For example, the pilot will inform the communicator that the helicopter has room for three litters and one walk-on. The medical staff will then

arrange the casualties in that order. Casualties must be tagged with their name, rank, SSN, unit, and type of injuries. All loose articles of clothing, such as 782 gear, are removed from the casualties.

### **Landing and Loading the Helicopter**

Once the pilot has acknowledged the location of the LZ by means discussed previously in this chapter, landing signalman enlisted signals are used to land the helicopter. Only one person is designated as the landing signalman. Once the helicopter has landed and a representative disembarks the aircraft, the landing signalman directs the representative to the senior medical staff personnel in charge. The helicopter representative will coordinate with the medical staff representative on how the casualties are to be loaded on the aircraft. Once all the casualties have been MEDEVACed, the COC will send a SALUTE and WIA (or Casualty CASREP) report to higher headquarters.

### **SUMMARY**

Evacuation by helicopter is the ideal evacuation method. This type of evacuation is usually available day or night. However, helicopters should be used with discretion as their number is usually limited and they draw enemy fire when observed. The individual Seabee should be taught basic first aid and, if wounded, to remain calm. If the wound is minor, a buddy should apply a battle dressing and continue to deliver fire until the action lessens. The ability of a buddy to give first aid depends on the tactical situation. Properly establishing an LZ and routes to the LZ from the BAS is important to any MEDEVAC plan. Pilots are just as concerned for their safety as you are about your troops safety. Remember, proper setup and control of MEDEVAC procedures are critical and will ensure that the individual Seabee will be back to build and fight another day.