



# *California Association of Air Medical Services Landing Zone Set-up and Safety Guidelines*

*February 2009*

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**PREPARATION FOR ARRIVAL – ELZ SELECTION SHOULD BE GUIDED BY THE FOLLOWING  
CONSIDERATIONS:**

### **OPERATIONAL GUIDELINES**

#### **Emergency Landing Zone Setup:**

The designated ground contact (referred to here as the **“ELZ Coordinator”**) is responsible for the identification, selection, preparation and security of the EMS helicopter ELZ to minimize the risk of scene response hazards.

#### **Preparation for Arrival**

**ELZ** selection should be guided by the following considerations:



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**OPERATIONAL GUIDELINES CONTINUED**

**Size** - During both **day** and **night** operations  
select an area of at least **100 ft x 100 ft** or 100 ft in diameter.

**The bigger the better.**

100' X 100'



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### OPERATIONAL GUIDELINES CONTINUED

**Hazards** – The ELZ area should be walked by the ELZ Coordinator to identify any obvious and hidden hazards. This will include any loose debris, large rocks, tree stumps, etc. Many ground hazards can be covered by tall grass. **Ask yourself the following question:** Will the rotor wash cause debris (trash, plywood, garbage cans, shopping carts, etc.) to be blown around by the high velocity winds? Some items can be picked up by the rotor wash and be blown into the rotor system causing damage to the EMS helicopter or could be blown away from the EMS helicopter potentially causing harm to onlookers or scene personnel.



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### **OPERATIONAL GUIDELINES CONTINUED**

**Obstructions** - Tall obstructions / hazards can be determined by standing in the center of the ELZ and with one arm raised to a forty-five (**45**)-**degree** angle anything that is noted to be in the proximity of the ELZ and above the individuals arm would be identified as a hazard and should be communicated to the flight crew prior to landing. Wires and poles are the most common hazards along with trees. The perimeter of the ELZ should be walked entirely and searched for overhead wires and or poles that may indicate the presence of wires. If able, park vehicles under and parallel to the direction of the wires.



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### OPERATIONAL GUIDELINES CONTINUED

**Surface** – The surface should be as firm and level as possible. Sand, loose dirt or snow is acceptable but could cause visibility problems (brown out or white out) during landing. Be aware that tall grass can be okay but the underlying surface may not be flat, or have hidden obstacles (tree stumps, fence posts). A soggy wet field may cause the EMS helicopter wheels or skids to sink beyond a safe point. The practice of wetting down a dusty ELZ is acceptable in most situations and may be requested by the flight crew. Particular attention should be made to wetting down the perimeter of the ELZ and work toward the center. As the EMS helicopter is making its final approach most debris / dust will initially be blown beginning at the leeward perimeter of the ELZ.



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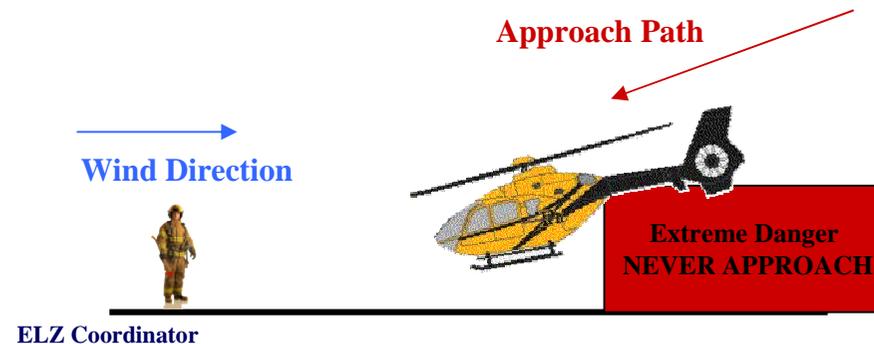
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## PREPARATION FOR ARRIVAL CONTINUED



**Slope** – The slope of the ELZ should be no greater than ten (10)-degrees. Always approach the EMS helicopter from the downhill side, **never** approach from the uphill side.





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### **PREPARATION FOR ARRIVAL CONTINUED**



**Location** - Proximity and accessibility are two important aspects of every ELZ. Try to get the ELZ setup as close to the scene as practical and **100 ft – 200 ft** downwind. Avoid having the EMS helicopter approach over the incident to minimize rotor wash on scene operations. Be cognizant of areas for physical access from the scene to the EMS helicopter, i.e. fences, ditches, guard rails etc. The patient will have to be carried over these obstacles, so choose a clear path if available.



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### **PREPARATION FOR ARRIVAL CONTINUED**

**ELZ operations on roadways and highways** – ELZ operations on roadways and highways, or immediately adjacent thereto, must be coordinated with on-scene law enforcement. Avoid blocking traffic if possible, but if landing on a road **stop all traffic in both directions without exception**. Where law enforcement is on-scene prior to designating the ELZ, the designation of the ELZ should be in conjunction with the on-scene officer in charge.

**Wind Direction** – In most cases the EMS helicopter will land ‘*into the wind*’ or with the wind to its nose. All reference to wind direction should be made with indication of where the winds are coming from.



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### **PREPARATION FOR ARRIVAL CONTINUED**

**Smoke Signaling Devices** - If you have smoke devices available ask the flight crew if they would like you to use it. Never use smoke devices unless this action is coordinated with the pilot. When using smoke, it must be non-flammable location due to the facts that the canister may put out a great deal of heat and can be blown away by the EMS Helicopter rotor wash if not properly positioned or secured.

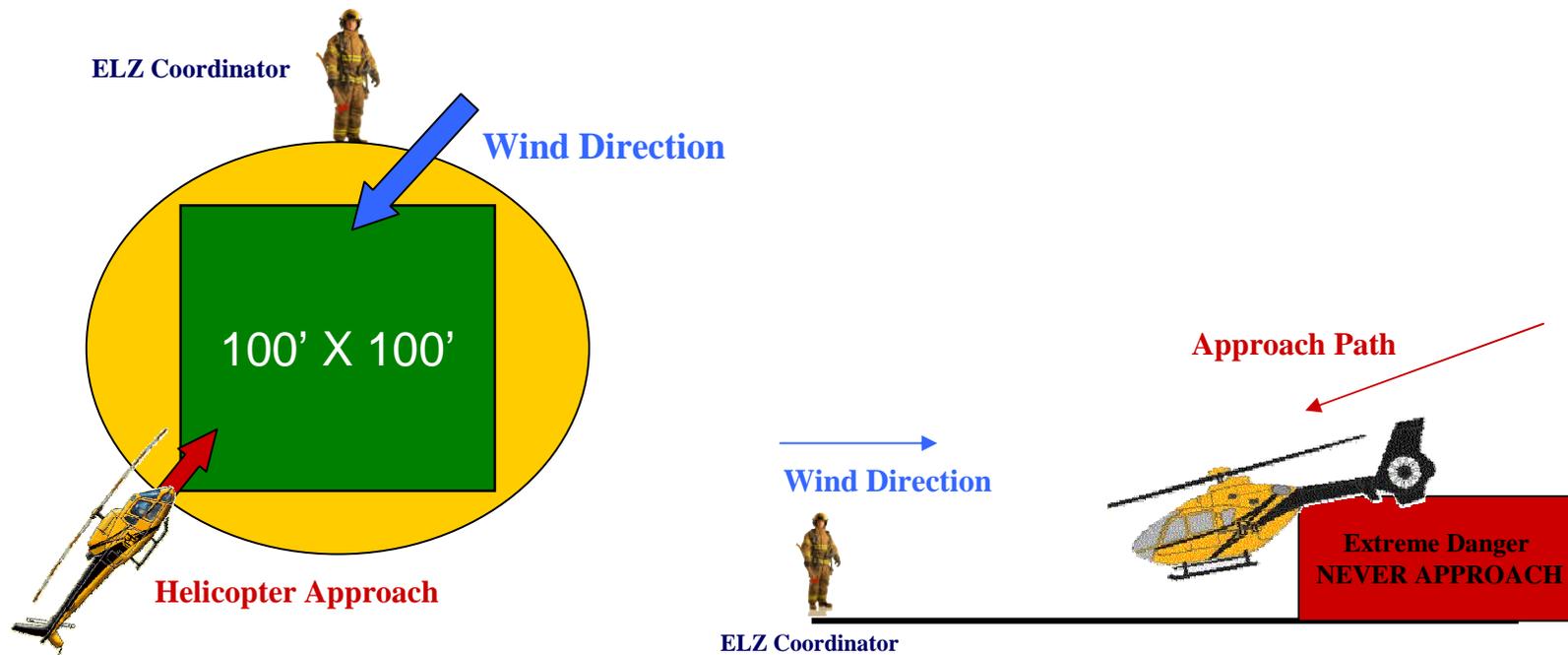


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## APPROACH DIAGRAM





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**PREPARATION FOR NIGHTTIME LANDING –  
ELZ SELECTION SHOULD BE GUIDED BY THE FOLLOWING CONSIDERATIONS:**



**NIGHTTIME LANDING OPERATIONS –  
THE FOLLOWING APPLY TO NIGHTTIME OPERATIONS:**

**DO NOT AIM ANY LIGHT DIRECTLY TOWARDS  
THE EMS HELICOPTER'S PILOT POSITION.**



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**PREPARATION FOR NIGHTTIME LANDING –  
ELZ SELECTION SHOULD BE GUIDED BY THE FOLLOWING CONSIDERATIONS:**



**DO NOT USE FLARES TO MARK AN ELZ  
UNLESS SPECIFICALLY REQUESTED BY THE PILOT.**

**THE EMS HELICOPTER SHOULD BE DIRECTED  
INTO THE WIND FOR FINAL APPROACH.**



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### **PREPARATION FOR NIGHT TIME LANDING – ELZ SELECTION SHOULD BE GUIDED BY THE FOLLOWING CONSIDERATIONS:**

**Night Time ELZ Marking** – using colored lights to mark ELZ is a complex operation.

Care should be taken to ensure that the incoming EMS helicopter is familiar with local practices regarding the meaning of any colored lights being used.

The **ELZ Coordinator** should convey the meaning (**red for hazard, amber for perimeter**, etc.) of any colored lights to the pilot prior to the EMS helicopter's final approach.



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### **PREPARATION FOR NIGHT TIME LANDING – ELZ SELECTION SHOULD BE GUIDED BY THE FOLLOWING CONSIDERATIONS:**

**If you have an ELZ kit**, place the four (4) amber colored lights around the perimeter of the ELZ. A fifth (5th) white light should be placed along the perimeter of the ELZ to indicate wind direction as it enters the ELZ. Signaling lights should be secured as well as possible given the terrain.



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**PREPARATION FOR NIGHT TIME LANDING – ELZ SELECTION SHOULD BE GUIDED  
BY THE FOLLOWING CONSIDERATIONS:**

**Without an ELZ Kit** - If vehicles are available, vehicles may be positioned at the perimeter of the ELZ with the headlights shining toward the center of the ELZ to form an “X.”

**NOTE:** The use of colored ELZ lighting systems to designate “hazard” and/or “ELZ” locations must be carefully coordinated; extreme care must be taken to ensure that lighting systems designating “hazard” locations and “ELZ boundaries” do not conflict from jurisdiction to jurisdiction.



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### **PREPARATION FOR NIGHT TIME LANDING – ELZ SELECTION SHOULD BE GUIDED BY THE FOLLOWING CONSIDERATIONS:**

**Once the EMS Helicopter is In Sight** – When ready, the flight crew will request ELZ info. The ELZ Coordinator should report current information on wind speed and direction, hazards, obstructions / obstacles, terrain surface conditions and other special landing considerations.

Hand-signals are not normally used during ELZ operations; however, within some interagency operations hand signals maybe standard practice.



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**PREPARATION FOR NIGHTTIME LANDING**

**ELZ SELECTION SHOULD BE GUIDED BY THE FOLLOWING  
CONSIDERATIONS:**

**INFORMATION TO BE PROVIDED TO THE FLIGHT CREW  
WHILE INBOUND THE ELZ COORDINATOR SHOULD  
PROVIDE:**

**NOTIFICATION OF ANY CHEMICAL HAZARDS BOTH IN  
THE AREA AND/OR PATIENT CONTAMINATION ISSUES.**

**NOTIFICATION OF MULTIPLE HELICOPTERS  
OVERHEAD AND OR INBOUND.**



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### ARRIVAL OPERATIONS

THE FOLLOWING SHOULD BE CONSIDERED DURING THE ARRIVAL AND GROUND OPERATIONS:



**Traffic / Crowd Control** – All vehicular and pedestrian traffic must be prevented from entering the ELZ. **No scene personnel** should get **closer than 50 ft** to the perimeter of the ELZ unless approved and directed by a flight crew member. **Vehicular traffic** includes all scene response, police and civilian vehicles. Keep all **bystanders at least 100 ft – 200 ft** from the ELZ perimeter. A fenced in area will be helpful in keeping people away but, on the other hand there may be livestock that could pose a similar problem.



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### ARRIVAL OPERATIONS

**THE FOLLOWING SHOULD BE CONSIDERED DURING THE ARRIVAL AND GROUND OPERATIONS:**



**The ELZ Coordinator should stand at the upwind edge of the ELZ (in proximity of the white wind direction light at night).** This will place the ELZ Coordinator at the far edge of the ELZ with the wind at his / her back. This will also place the designated ground contact away from the EMS helicopter as it makes its final approach into the wind.

**All other personnel or bystanders should be kept to the extreme edge of the ELZ** to protect them from objects that could be blown by the rotor wash or downdraft.

**The pilot is the final authority** to accept or reject any landing zone and may elect to coordinate with the ELZ Coordinator to select a more suitable location if identified.



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**ARRIVAL OPERATIONS**

**THE FOLLOWING SHOULD BE CONSIDERED DURING THE ARRIVAL AND  
GROUND OPERATIONS:**



**As the EMS helicopter approaches make sure that necessary precautions have been taken to ensure no unauthorized entry into the ELZ during final approach.**

**Once the EMS helicopter has made its approach to the ELZ it may hover and maneuver to provide the best accessibility for the patient loading.**



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**GROUND OPERATIONS – THE FOLLOWING SHOULD BE CONSIDERED DURING  
THE ARRIVAL AND GROUND OPERATIONS:**

**AFTER LANDING:**

**AT NO TIME SHOULD ANY GROUND PERSONNEL APPROACH OR  
RETURN TO THE EMS HELICOPTER WITHOUT SPECIFIC CREW  
APPROVAL, DIRECTION AND ACCOMPANIMENT.**

**WHEN APPROACHING ANY HELICOPTER, APPROACH IN THE  
CROUCHED POSITION WHEN ENTERING THE TIP PATH PLANE  
AND REMAIN CROUCHED UNTIL WELL UNDER THE ROTOR DISC  
AND CLOSE TO THE HELICOPTERS FUSELAGE.**



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**GROUND OPERATIONS – THE FOLLOWING SHOULD BE CONSIDERED DURING  
THE ARRIVAL AND GROUND OPERATIONS:**

**AFTER LANDING CONTINUED**

**AT NO TIME SHOULD PERSONNEL BE BEHIND THE HORIZONTAL TAIL  
FINS ON A REAR LOADING HELICOPTER OR BEHIND THE FUSELAGE  
WHERE THE TAIL BOOMS BEGIN ON A SIDE LOADING AIRCRAFT.**

**GROUND PERSONNEL SHOULD HAVE APPROPRIATE HEAD, HEARING,  
AND EYE PROTECTION IF OPERATING NEAR THE HELICOPTER AND  
HAVE NO LOOSE OBJECTS ON THEIR PERSON.**

**NO EQUIPMENT ABOVE MID CHEST LEVEL WHEN APPROACHING A  
RUNNING HELICOPTER (I.E. IV POLES, BAGS, ETC.).**



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**GROUND OPERATIONS – THE FOLLOWING SHOULD BE CONSIDERED DURING THE ARRIVAL AND GROUND OPERATIONS:**



**ONLY EMS HELICOPTER PERSONNEL SHOULD OPERATE AIRCRAFT DEVICES AND PARTS (AIRCRAFT DOORS, BAGGAGE COMPARTMENTS, COWLINGS, LITTER LOCKING DEVICES, ETC.)**

**SOME PATIENTS MAY BE DECLINED DUE TO:**

- \* Radioactive or chemical contamination unless proper decontamination steps have been taken.**
- \* Patient's that are violent or combative unless they are physically or chemically restrained.**
- \* Patient's who do not meet the weight limitations (pounds and girth) of the EMS helicopter loading system / sled / gurney may need a different mode of transport.**



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**DEPARTURE OPERATIONS- THE FOLLOWING SHOULD BE CONSIDERED  
DURING DEPARTURE OPERATIONS:**



**During ground operations the pilot will have already formulated a departure path / plan.**

**Depending on situation the departure path may be into the wind passing over the windward side of the ELZ perimeter.**

**Other times the departure may mimic the approach.**

**IN ANY CASE WHEN THE EMS HELICOPTER IS PREPARING TO DEPART BE AWARE OF ANY EQUIPMENT OR COMPARTMENT DOORS THAT MAY BE OPEN AND IMMEDIATELY NOTIFY THE CREW.**



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**DEPARTURE OPERATIONS- THE FOLLOWING SHOULD BE CONSIDERED DURING  
DEPARTURE OPERATIONS:**

**PRIOR TO THE EMS HELICOPTER DEPARTING:**

When the pilot begins to depart **be aware of flying debris** (you may briefly turn your back to the EMS helicopter until the debris subsides).

The ELZ Coordinator should **look for overhead traffic** (other air ambulances, news helicopters, airplanes) since visibility is limited above the departing EMS HELICOPTER.

The **ELZ Coordinator** should report that the  
**“OVERHEAD IS CLEAR OF TRAFFIC”** or  
**“I HAVE TRAFFIC OVERHEAD YOUR POSITION.”**



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**DEPARTURE OPERATIONS- THE FOLLOWING SHOULD BE CONSIDERED DURING DEPARTURE**



**PRIOR TO THE EMS HELICOPTER DEPARTING CONTINUED:**

It is recommended that the designated ground contact position themselves at a 45 degree angle to the windward side of the ELZ. This will prevent the potential situation of the EMS helicopter departing into the wind and directly over the designated ground contact's position.

**After the EMS helicopter departs the ELZ, the security of the ELZ should be maintained until the pilot "clears the aircraft of the ELZ."**

**This is necessary in case the departing EMS helicopter **must emergently return** due to **mechanical or other safety issues.****



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**COMMUNICATIONS – UNLESS OTHERWISE DESIGNATED BY THE REQUESTING AGENCY, THE FOLLOWING VHF COMMUNICATIONS ASSIGNMENTS ARE RECOMMENDED:**

### **AIR-TO-GROUND VHF FREQUENCIES:**

**Primary: CALCORD (156.075).**

**Secondary: locally designated**

**Alternate: locally designated**

**Air-to-Ground 800 Talk Groups-** the following 800 MHz talk groups are common to every 800 MHz system. These national interoperability talk groups should be considered in the **absence of a designated 800 MHz** air-to-ground talk group assignment. These national interoperability talk groups are generally line-of-sight and are useful after the EMS helicopter arrives in the area:



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**COMMUNICATIONS – UNLESS OTHERWISE DESIGNATED BY THE  
REQUESTING AGENCY, THE FOLLOWING VHF COMMUNICATIONS  
ASSIGNMENTS ARE RECOMMENDED:**

**Primary: I-CALL Direct**

**Secondary: locally designated**

**Alternate: locally designated**



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**COMMUNICATIONS – UNLESS OTHERWISE DESIGNATED BY THE REQUESTING AGENCY, THE FOLLOWING VHF COMMUNICATIONS ASSIGNMENTS ARE RECOMMENDED:**

**AIR-TO-GROUND COMMUNICATION PROTOCOLS - THE FOLLOWING AIR-TO-GROUND COMMUNICATION PROTOCOLS ARE RECOMMENDED:**

**It is recommended that designated air-to-ground frequencies should only be used for EMS helicopter-to-ELZ operations whenever possible.**

**Dual usage of frequency assignments may lead to missing critical information.**

**MAINTAIN “RADIO SILENCE” ON FINAL APPROACH AND TAKE-OFF  
UNLESS A SAFETY ISSUE ARISES.**



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**COMMUNICATIONS – UNLESS OTHERWISE DESIGNATED BY THE REQUESTING AGENCY, THE FOLLOWING VHF COMMUNICATIONS ASSIGNMENTS ARE RECOMMENDED:**

**Use the words “**ABORT ABORT ABORT**” or “**STOP STOP STOP**” to alert the pilot that an imminent safety condition or unforeseen hazard exists during landing.**

**The priority of the designated ground contact during EMS helicopter take-off and landing operations is ELZ safety and security.**

**AIR-TO-AIR FREQUENCIES – UNLESS OTHERWISE DESIGNATED BY THE REQUESTING AGENCY, THE FOLLOWING “AIR-TO-AIR” FREQUENCY IS RECOMMENDED:**

**Primary: 123.025 MHz**



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## **CONTACT US**

**For further information or with questions, please**

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