

Rope Rescue



Morgan Co. Emergency & Rescue Squad, Inc. **STANDARD OPERATING GUIDELINES**

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These SOGs are based on FEMA guidelines FA-197

PURPOSE:

This standard operating guideline addresses response to and operations during a rope rescue during a low-angle, steep-angle or high-angle rescue situation and may include information on equipment use and maintenance.

The purpose of this procedure is to establish guidelines for conducting rope rescues. Because of the infinite number of potential sites and situations that could be encountered, this procedure will not define a specific evolution to use, but will give guidelines to follow for conducting safe and effective operations.

SCOPE:

This SOG pertains to all personnel in the MCERS.

DEFINITIONS:

These definitions are pertinent to this SOG.

Rope Rescue:

Rope rescue is defined as any rescue attempt that requires rope and related equipment to safely gain access to, and remove patients from, hazardous geographic areas with limited access such as mountains, high rise buildings, above or below grade structures, by means of rope system. Mountain/rope rescues are divided into three general categories; low-angle, steep angle, or high-angle rescues.

Low-angle evacuations are those of less than 40° inclination, or rescues where the patient may be safely walked out with or without a stokes basket. Steep-angle evacuations are those from 40° to 60°. High Angle evacuations are considered those from 60° to 90°.

GUIDELINES AND INFORMATION:

Response to and Operations during a Low-Angle, Steep-Angle, or High-Angle Rescue Situation:

TACTICAL CONSIDERATIONS

PHASE I: Arrive on Scene. Take Command. Size-Up.

- A. First Arrival: The first arriving on scene should assume Command until more qualified personnel arrive.
- B. Secure Responsible Party or Witness: Command should secure a witness as soon as possible after arriving on scene. This will help in identifying the problem and locating the victim.
- C. Locate the Victim: In some cases, Command will have to send a recon team to the area of the victim to determine the exact location of victim and nature of injuries. Command may wish to designate this as **Recon Sector**. **Recon Sector** should have EMS equipment to begin to administer the first aid to the victim. If the terrain is greater than 60 degrees inclination, Command may decide to wait until the Technical Rescue Team (TRT) arrives with the proper equipment to reach the victim. Command may also choose to use aerial recon, if available.

- D. Assess the Need for Additional Resources: **Recon Sector** should provide Command with enough information, or recommend the need for additional resources. Information that will be helpful in determining the need for additional resources would be: number of victims, location and condition of victims, estimated angle of terrain, distance to victim, and estimated time of extraction.
- E. Assess the Hazards: Command may wish to designate a **Safety Sector** to identify all potential hazards to rescuers. **Safety Sector** will be responsible for securing those hazards or making all members aware of those hazards. **Safety Sector** shall also be responsible for assuring that all safety procedures are adhered to.
- F. Decide on Rescue or Recovery: **Recon Sector** should advise Command whether the operation will be conducted in the rescue or recovery mode. In the rescue mode personnel assigned to Recon Sector will be reassigned to Treatment Sector and Recon Sector will be terminated. If the operation is to be conducted in the recovery mode, Command may wish to leave the victim and any related equipment in place for investigative purposes.
- G. Decide on an Action Plan: With the recommendation from **Treatment Sector**, Command will have to decide on an action plan. **Extrication Sector** and **Safety Sector** shall be made aware of the specific action plan.

Deployment of the TRT personnel in the Action Plan needs to be monitored by Command to ensure trained TRT members are available to staff critical functions. Dependent on the incident, these would be in the following areas:

- A. Rescue Team involving Rope rescue and any climb requiring technical skills and/or training. TRT should include a Paramedic and/or medical personnel when possible.
- B. Liaison will provide technical capability to Command, especially when operation involves other agencies. This function can usually be filled by the Special Operations Officer responding to the call.

PHASE II: Pre-Rescue Operations

- A. Make the General Area Safe: Command or his/her designee should begin to make the general area safe. This may include securing the area and not allowing civilian personnel into the area.
- B. Make the Rescue Area Safe: Command or his/her designee should make the immediate rescue area safe. This may include removing all civilian personnel and all non-essential rescue personnel from the area. If it is not possible to secure all the hazards in the immediate rescue area, all personnel operating in that area shall be made aware of those hazards.

- C. Pre-Rescue/Recovery: Depending on the action plan established, Command may want to establish an **Extrication Sector**. **Extrication Sector** will be responsible for gathering all equipment and personnel necessary to operate according to the action plan. **Extrication Sector** will assign rescue personnel to conduct the rescue, and support personnel to support the rescuers, during the actual rescue phase. **Extrication Sector** should have an alternative action plan should the first choice plan fail. This alternate plan should be communicated to all personnel operating in the rescue area.

PHASE III: Rescue Operations

After pre-rescue operations are complete, **Extrication Sector** shall put forth the action plan removal of the victim(s). Rescue operations should be conducted from low risk to high risk. Rescues should be conducted with the least amount of risk to rescuers necessary to rescue the victim. Low risk operations are not always possible but should be considered first. If the rescue of the victim(s) is only possible by means of a high risk operation, **Extrication Sector** shall communicate with Command the risk/benefit of the operation.

The order of rescue from low risk to high risk would be:

Talk the victim into self-rescue. If the victim is not exposed to a life threatening situation, it may be possible to talk the victim into self-extrication. If the victim is exposed to a life threatening situation, it may be best to advise the victim to stay in place until a rope rescue system can be set up.

For terrain less than 40° inclination, (Low-Angle) most first responders have the equipment and training to assist the victim down. If the victim is ambulatory, he/she can walk up/down with the assistance of rescuers. If the victim is injured or unable to assist in their own rescue, he/she should be packaged properly in a stokes basket and carried to safety.

The stokes extrication should be conducted with a minimum of 4 litter bearers. Bearers should face the direction of travel during the extrication. If appropriate, a tag line should be attached to the litter for assistance through unstable areas.

For a steep-angle extrication in terrain of from 40° to 60° inclination, the TRT shall be called in to assist with the extrication. If the victim is ambulatory, he/she may be assisted by rescuers with the use of a belay/tag line. If appropriate, rescuers should set up an anchor system for the raise/lower. A body belay may also be used by rescuers, if appropriate.

If the victim is not ambulatory, rescuers shall build an anchor system and prepare for a steep-angle evacuation. The patient shall be packaged properly in a litter and prepared for the extrication. There shall be at least 3 litter attendants assisting with the litter evacuation. Attendants should face the anchor during the evacuation and be clipped into the litter. A separate raising/lowering line and belay line shall be set up for raising or lowering during steep angle evacuations. More chance of injuries occurs in steep-angle rescues than in high-angle. Please use due caution and proper techniques during this rescue.

For evacuations greater than 60°, the TRT shall conduct the evacuation. Evacuations greater than 60 degrees are considered high angle operations. The **Extrication Sector** officer, in conjunction with the **Safety Sector**, should decide the most appropriate method to extricate the victim. This may include putting the victim(s) in a harness and raising or lowering them, or packaging them in a litter for the raising and/or lowering.

In any case, a 15:1 safety factor shall be maintained and a double rope technique shall be used if at all possible. If possible, a separate anchor should be used for the working line and the belay line. Proper care shall be taken to assure that the victim will not come out of the harness or litter used to extricate him/her. Whichever method of extrication is used, the **Extrication Sector** officer shall ensure the overall safety of the raising/lowering system. **Extrication Sector** shall designate the tasks of individual rescuers during the operation.

PHASE IV: Termination

PREPARE FOR TERMINATION

- A. Personnel Accountability.
- B. Equipment accountability. If there has been a fatality, **Extrication Sector** may consider leaving equipment in place for investigative purposes.
- C. Re-stock vehicles.
- D. Consider debriefing
- E. Secure the scene. Return to service.

Additional Considerations

- A. HEAT. Consider rotation of crews.
- B. COLD. Consider effects of hypothermia on victim and rescuers.
- C. RAIN/SNOW. Consider the effects of rain on the hazard profile.
- D. TIME OF DAY. Is there sufficient lighting for operations extending into the night.
- E. Consider the effect on family and friends; keep family informed.
- F. Consider news media; assign a P.I.O.

ROPE MAINTENANCE

ROPE INSPECTION

Life safety rope, cord and webbing shall be inspected at a minimum of twice yearly, and after each use. If a problem is noted during the inspection, it shall be reported to the Rope Team Coordinator. The inspection of life safety and utility rope should check for the following:

- Damage to the sheath
- Visible damage to the core

- Soft spots or necking down
- Chemical or petroleum contamination
- Burns, (glazed, glossy, or melted spots)
- Heavy surface fuzz
- Rust contact – (Discolor is the prime indicator)

CARE OF ROPE WHILE IN USE

- Do not step on ropes
- Protect ropes against chafing and running over sharp corners or edges
- Protect ropes from exposure to chemicals, petroleum products, battery acids and vapors
- Protect ropes from mechanical or heat damage
- Avoid running nylon ropes across nylon (or synthetic across synthetic)
- Keep nylon ropes away from heat
- Attempt to keep ropes dry, as rope loses approximately 15% of its strength when wet

ROPE STORAGE

Rope should be flaked (laid in a forward-reverse flat pattern that allows for complete visual inspection) in a rope bag and stored in a cool dry area. Damage to rope could occur if:

- Exposed to petroleum products, chemicals or fuel and their vapors
- Exposed to battery acid, vapors or residue
- Exposed to bleach or bleach vapors
- Stored on concrete floors, as moisture in the concrete will produce a mild acid and vapor
- Stored when contaminated with dirt or grit
- Stored in sun light, as ultraviolet light can damage most ropes
- Stored with knots left in rope

CLEANING OF LIFE SAFETY ROPE

Rope is best washed in cool water with a mild detergent. Tub washing is best as it allows dirt particles to settle by gravity naturally. Under **NO** circumstances use a hose washer/pressure washer or commercially made rope washer. These will potentially damage a rope's reliability, as in the cleaning process only a percentage of dirt and grit is removed - with deep grit being forced in – potentially to the un-inspectable core where it can cause unseen fiber damage!

Wet ropes are not dried in sunlight but are hung or chained to be air-dried. When rope, webbing or cords are returned to the company they shall be inspected upon return before being placed in service.

CRITERIA FOR REMOVING LIFE SAFETY ROPE FROM SERVICE

Life safety ropes will be removed from service when:

- Rope exhibits obvious fault or damage
- Worn out from excessive age or usage
- More than half of the outer sheath yarns are broken
- Exposed to an observable shock load
- Stressed by a load beyond what it was designed to support
- Contaminated by chemicals
- Usage cannot be accounted for
- Maximum life span reached (10 years for a life safety rope, but most rope manufacturers and rescue teams use a 5 year standard based on level and type of use)

ACCOUNTABILITY: LIFE SAFETY ROPE NUMBERING

Each life safety line is assigned a serial number, which will be found at each end of the rope. The serial number indicates the squad's name the rope is assigned to, the rope length, and the rope ID number.

Example: MCERS100-1

Means: Morgan Co. Emergency Rescue Squad – 100' long – Rope number 1

ROPE RECORDS:

It is vital that a history of a Life Safety Rope's uses be maintained in a permanent fashion. Such a history compiled by the user serves as a basis for judgments such as safety and when to retire the rope.

The following Rope Log will be used and maintained for each rope placed in service:

Insert Excel Spreadsheet: MCERS Rope Log