



The Incident Commander sets the tone for the successful management of the incident by implementing a command structure, giving clear objectives and assignments, and coordinating the activities of the various responders.

Command and Control in Low Angle Rope Rescue Operations

The incident command system is the framework for managing any incident.

Prior training in ICS is important so everyone knows where they fit into the system.

ICS should be used to manage all phases of the rescue operation.

Small incidents can be managed by one person wearing all the hats.

The ICS expands as the incident grows to maintain an efficient span of control.

Incidents that involve more than one jurisdiction may be managed by Unified Command.

Positions that may need to be filled on a "typical" low angle rescue incident include:

- Incident Commander (IC).
- Safety Officer (this role may be retained by the IC).
- *Rescue Group Leader*
- *Technical Safety Officer*
- *Rigging Team Leader*
 - Main Line Tender.
 - Belay/Safety Line Tender
 - Haul Team Leader
 - Hauler
- *Entry Team Leader / Edge Person*
 - *Rescuer(s)*
 - Litter Team Leader
 - Litter Team
- Support Team Leader

General information:

The successful outcome of a technical rope rescue incident is dependent upon all personnel working within the Incident Management System (IMS) under direction of the Rescue Group Leader who in turn reports to the on scene Incident Commander (IC). The Incident Management System provides safety, accountability of personnel, communications, direction, an action plan and set roles, each with delegated responsibilities.

This section, "Response and Operations Phase", details actions and responsibilities during a response to a technical rope rescue incident, from the role of the first arriving unit, through single and multiple rope system evolutions.



First arriving unit:

The role of the first arriving unit to a rope rescue based incident includes:

1. Perform a scene size up to determine exactly what the incident entails.
2. Stabilize the incident by providing site control and scene management to prevent additional accidents.
3. Establish command in order to initiate incident organization *or*
4. Pass command in the event immediate action is required commensurate with your level of training.
5. Declare on air that the incident involves technical rope rescue.
6. Determine if operations will commence under a Rescue or Recovery Mode.
7. Perform a Risk/Benefit Analysis.
8. Call for assistance appropriate to your jurisdictions policies.

Scene Size Up:

Performing a scene size up will help determine the scope and magnitude of the incident and provide direction on the best approach for formulating an action plan. Many factors may impact the simplicity or complexity of a technical rescue involving rope rescue, and information gathered during the scene size up may include but is not limited to:

1. Determine the number and location of patients.
2. Determine how best to provide scene security.
3. Determine the stability of the ground relative to the area surrounding and above the patients' location.
4. Determine the impact of environmental factors.
5. Determine any impact from exposure to utilities.
6. Determine access points to the patient(s).
7. Determine location and type of anchors available to be utilized.
8. Determine the slope profile.
9. Determine the needs of the patient(s).
10. Determine how best to meet the needs of the patient(s).
11. Determine Rescue or Recovery Mode.
12. Perform a Risk/Benefit Analysis.
13. Determine equipment required/ equipment available.
14. Determine resources required/ resources available.

Awareness Level Operations:

Jurisdictions operating under awareness level training for rope rescue should limit operations at a technical rescue requiring rope rescue to functions as outlined above under the heading of "First arriving unit". The exception to this statement is that the first arriving unit must establish command only and not pass it to perform immediate rescue unless they are trained to do so.



Determining Patient Needs:

Determination of patient needs begins by making contact with the patient and/or witnesses. This contact will provide crucial information necessary in order to formulate an action plan. The immediate needs of a patient are two fold; first determine if the patient is injured or not and second, determine if the patient is in a stable position.

If a patient is injured, try to ascertain the extent and severity of the injuries.

This information is vital not only in dictating the course of patient care; it also starts the clock for weighing out how rapid of retrieval is required. If a patient is in a precarious position and exposed to the possibility of a secondary fall, immediate action from the rescuers proportionate to their level of training will be required.

Rescue/Recovery Mode:

Making a determination if operations will commence under Rescue or Recovery Mode **shall** be ascertained prior to initiating operations. This determination will affect the urgency and pace of the incident. If a determination is made to operate in the Rescue Mode, it is based on the belief that there is a viable patient that must be retrieved, but only at a pace reflective of the ability of the rescuers to safely perform the operation proportionate to the level of training that they have received.

A Recovery operation is based on the recognition that the patient is not viable. A recovery operation is a more calculated event conducted at a slower pace when a sufficient number of trained personnel are available to safely mitigate the event. The safety of all rescuers is of paramount importance; therefore no undue exposure of risk to rescuers is acceptable at any time for the recovery of a body.

Risk/Benefit Analysis:

Determination to operate in the Rescue Mode **shall** be accompanied by a Risk/Benefit Analysis. A Risk/Benefit Analysis is based on weighing the degree of risk that rescuers will be exposed to vs. the benefits to be gained for taking those risks. A Risk/Benefit Analysis therefore measures the ability of the rescuers to resolve the exposure to danger that the patient faces, but only at a pace that balances the safety of the rescuers to the necessity to limit the amount of time that the patient is exposed to danger.



Slope Profile:

Evaluation of the slope in its entirety is necessary to help determine how best to retrieve the patient in a sloped environment. This “slope profile” includes the blending of information relating to the angle of the slope, what the surface of the slope consists of, and the run out of the slope. (Example: a slope of 30 degrees with a dry dirt surface may be easily walked up unassisted, if the same 30 degree slope runs out over a cliff or has a wet grass or loose gravel surface, a different approach will be required due to the differences of the slope profile.)

Low Angle Rescue:

A low angle slope can be defined by angle as a slope between 0 and 30 degrees. In rope rescue, this is an environment in which a rope may be required, but serves the function as a belay only and not to haul the rescuers and patient up slope. On a low angle slope, all of the weight of the load from the rescuers and patient is on the ground and if the rescuers slipped without a rope present, they would not be impacted by injuries from an uncontrollable fall.

The use of a single rope may be utilized on a low angle slope to provide support to a litter team. This scenario most typically comes into play for a litter team retrieving a packaged patient from a vehicle accident down an embankment that needs minimal support to assist footing and to regain the top of the embankment. If a low angle slope is impacted by a hazardous run out and/or an unstable surface, a Risk/Benefit evaluation should require the use of a two-rope system.

The number of rescuers that may be utilized as part of a litter team on a low angle rescue is between four and six. Four litter tenders (two per side), is the most typical arrangement for carrying a patient with the addition of a fifth member, if available or necessary, at the tail of the litter to provide additional assistance as required. Six members may be necessary for a very heavy patient; however the use of six litter tenders (three per side) typically can cause more difficulty than benefit as the additional litter tenders may hamper extrication due to stepping on one another's feet and/or throwing each other off balance as they attempt to coordinate synchronized movement.

Medium Angle Rescue:

A medium angle slope can be defined by angle as a slope between 30 and 45 degrees. In rope rescue, this is an environment in which a two-rope system protects the rescuers from falling and also provides assistance to the rescuers in regaining the top of the slope. On a medium angle slope, the majority to all of the weight of the load from the rescuers and patient is still on the ground, and the two-rope system prevents falling down slope, as well as assisting the rescuers with regaining the top of the slope.

The use of a two-rope system is required for a medium angle rescue. One rope (Main Line) provides fall protection to the rescuer or litter team during a lowering operation and also with mechanical advantage assistance to personnel operating the Main Line to return the litter team to the top. The second rope (Belay Line) acts as a redundant line in case of Main Line failure, and also as a necessary belay when the Main Line is in motion or resetting.

The number of rescuers that may be utilized as part of a litter team on a medium angle rescue is either three or four dependent on slope profile.

Four litter tenders (two per side), may be utilized on shallower angled slopes on a medium angle rescue. As the slope becomes steeper, or the footing is so poor that the load from the rescuers and patient is transferred more from the ground to the rope system, the number of



litter tenders must drop to three (one per side and one on the tail end of the litter), to lessen the amount of load that impacts the rope system. All rescuers and the patient are connected at two points on the system.

High angle rescue:

A high angle slope can be defined by angle as a slope between 45 and 60 degrees. In rope rescue, this is an environment in which a two-rope system protects the rescuers from falling and is usually required to allow the rescuers to regain the top of the slope. On a high angle slope, the weight of the rescuers and patient is predominately focused onto the rope system. If the rope system was not present, an uncontrollable fall could possibly impact the rescuers and/or they would not be able to regain the top of the slope on their own.

The use of a two-rope system (Main and Belay Line) is required for a high angle rescue. The only exception to a two-rope system for a high angle rescue falls under the need to perform an immediate rescue and only in extenuating circumstances as detailed below under “Immediate access of a patient”.

The number of rescuers that may be utilized as part of a litter team on a high angle rescue is three. Three litter tenders positioned one per side and one on the tail end of the litter provides balance in supporting the weight of the patient in the litter and maintains minimal impact potential from the load upon the rope systems. All rescuers and the patient are connected at two points on the system.

Vertical Rescue:

A vertical angle slope can be defined by angle as a slope greater than 60 degrees to completely vertical. In rope rescue, this is an environment in which a two-rope system protects the rescuer and patient from a fall certain to cause injury or death, and the rope system is the only way possible for the rescuer and patient to regain the top of the slope. In vertical rescue, the weight of the rescuer and patient is completely reliant upon the rope system.

The use of a two-rope system (Main and Belay Line) is required for vertical rescue. The only exception to a two-rope system for vertical rescue falls under the need to perform an immediate rescue and only in extenuating circumstances as detailed below under “immediate access of a patient”.

The number of rescuers that may be utilized as part of a litter team on a vertical rescue is zero, one, two, or three. If a litter is oriented horizontally with the rope systems attached above the litter, only one tender is necessary to keep the litter from striking the vertical wall and/or to maintain the patient’s airway. If the litter is oriented horizontally and suspended from a high line or from a high pick point (such as an aerial apparatus) and the patient does not require the medical support, the decision to not utilize a tender may be dictated by a Risk/Benefit Analysis. The use of a tag line attached to the litter may be necessary to prevent the litter from spinning back and forth around the ropes that the litter is suspended from. A maximum of two persons (rescuer and patient) are allowed on a litter oriented horizontally with the rope systems attached to a harness above the litter.

Two litter tenders may be utilized in unique circumstances positioned one per side on a very steep angled slope, or in areas with limited space such as airshafts. The rope systems in such cases will be attached at the head of the litter. The location of the two litter tenders in this situation is slightly towards the tail end of the litter from centerline of the litter, in balance



with the rope, which holds the head of the litter up. Three litter tenders may still be utilized on a slope that is transitioning between high angle and vertical if the support of the additional person is necessary. The rope systems in such cases will still be attached at the head of the litter.

Transitioning Angle Rescue:

If the slope transitions in angle, the number of litter tenders allowed on the system may be dictated by what the greatest impact will be to either the litter tenders or to the rope system. (Example: if a high angle slope of 60 degrees culminates with a short stretch of vertical before the top of the slope, three litter tenders will be required to support the litter up the 60 degree slope and the rope system will still easily support the litter tenders over the short vertical segment.

