

TECH NOTES

OREGON OCCUPATIONAL SAFETY AND HEALTH DIVISION STANDARDS AND TECHNICAL RESOURCES SECTION

TOPIC: Tripod, Rescue-Descent Equipment, 1910.146, ANSI/UL standard 1323 and federal OSHA letters of interpretation to Sweeney, September 94, to Johnson, October, 93, to Howe, September 93, to Kennedy, July 93 and to Clark, April 93

There must be a plan of rescue that includes the method of rescue to be used. Appropriate retrieval equipment or methods must be used when entering confined spaces under the plan. The two methods of rescue are entry into the space or no entry where a lifeline is attached to the person entering the space. If a person must be lifted out of a confined space and the depth is 5 feet or greater then mechanical equipment must be available for retrieval.

A qualified person must determine what rescue equipment will be needed to ensure a safe and prompt rescue, the proper type and availability of the equipment if retrieval lines are used.

The use of a retrieval line is preferred for all entries to facilitate rescues. However, the standard does not require use of a retrieval system if the retrieval equipment would increase the overall risk related to permit space entry or would not contribute to the rescue of the entrant.

If a retrieval line is used then a mechanical device must be available to retrieve the person entering the confined space.

If vertical extraction is required then a tripod or other lifting device must be set up at the time of entry.

When tripods, rescue, entry and fall protection equipment are being used for entry or rescue purposes they must be installed and used in compliance with the manufacturer's installation and operating procedures.

The equipment must enable a rescuer to remove an injured worker from the enclosed space quickly and without injury to the rescuer or further harm to the fallen worker. A harness, lifeline and self-supporting winch can normally be used for this purpose.

In developing a plan of rescue proper retrieval equipment must be selected and used.

The tripod or davit arm:

The system selected must be designed and rated for human use as required by 1910.146(k)(3)(ii). The performance oriented nature of the standard allows flexibility as to the design specifications of the retrieval equipment itself. OSHA will accept certification by the manufacturers as well as listing (as being tested) by a nationally recognized testing laboratory.

The tripod or davit arm system must be capable of supporting all imposed loads within the design limits set by the manufacturer or be designed with a 4:1 safety factor.

The tripod should have adjustable feet for varying footing conditions.

Legs or support arms must be designed and set up so as to prevent movement of the support system when loaded.

When using a boatswain's chair or other similar device for lifting or lowering personnel, two separate tie off rings connected to the support bracket at the top of the tripod or davit must be provided so that the lifeline and lowering cable may be tied off to separate tie off points. When using a retrieval line a single tie off ring is needed.

The lines:

Lifelines must have a breaking strength of 5,000 pounds or with a 2:1 safety factor.

Lines used to lower materials should have a 4:1 safety factor based on the design capacity of the hoisting device.

When lowering personnel in a boatswain's chair or other device the worker must be protected from fall by a separate safety line connected to a body harness. The lifeline and lowering line must be connected to separate tie-off points on the support device.

Hoisting winches:

All hoists used for lifting personnel must be rated for human use.

All hoists must be listed by a nationally recognized testing laboratory for their intended use.

All hoists must meet the following or equivalent conditions based on UL standard 1323:

Be equipped with a means to prevent uncontrolled descent speed in excess of 35 feet per minute.

Have a manual cranking system and be operable by one person in addition to any power system.

Be equipped with a drive pawl and a locking pawl that will automatically engage when the driving pawl is released during hoist operation.

All hoists to have a mechanical advantage with a positive crank force to rise or lower personnel.

All hoists for lifting personnel to have a primary and secondary braking system.

The primary brake must automatically stop the hoist and its rated load when the power or cranking motion is interrupted or discontinued.

The secondary brake must automatically arrest the descent of the hoist load under over speed conditions within 12 inches of vertical descent.

All hoists must be marked with their rated load capacity and maximum cable length.

Body harness:

All personnel entering a confined space where nonentry rescue will be performed must wear a chest or full body harness with a retrieval line attached at the center of the users back at shoulder height or above.

All components of a fall arrest system must meet the design requirements of 1926.502.

All hardware used in fall protection must meet the requirements of 1926.502.

All other hardware being used as part of a retrieval system must meet ANSI/UL standard 1323.