

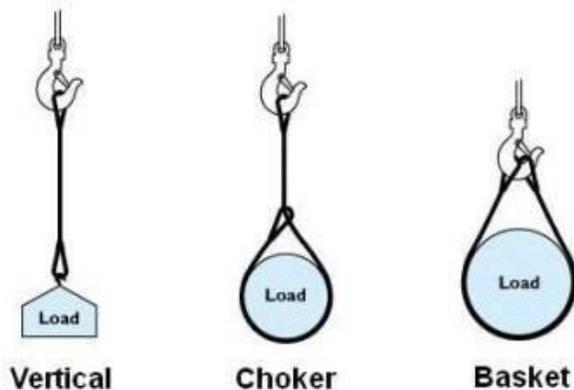
TerranearPMC Safety Share

Week of May 2, 2016 – Rigging

Rigging: that is the practice of securing loads that are intended for being lifted by heavy equipment. Rigging is a critical part of work at construction sites as well as at shipyards and general industry. The workers that perform this task are referred to as riggers. Riggers can also function as signalman for crane operators and other workers that maneuver heavy equipment. Improper rigging of a load can result in serious injuries. Annually about 50 riggers are killed when loads have slipped from the rigging, or when the rigging equipment has failed. To protect workers against accident, OSHA has a series of strict rigging regulations. These regulations require rigging equipment to be properly maintained and inspected while employees are required to attend comprehensive training.

The most prevalent OSHA regulations for rigging are 29 CFR 1910.184 – Slings (within the OSHA general industry standard – Subpart N - Materials Handling and Storage), 29 CFR 1926.251 - Materials Handling, Storage, Use, and Disposal (within the OSHA construction standard), 29 CFR 1926.753 – Hoisting and Rigging (within the Steel Erection Standard – 1926, Subpart R), and within the OSHA Shipyard Standard – 29 CFR 1915 – Ropes, Chains and Slings (1915.112).

Choosing the right sling (or choker) for lifting requires that the weight of the load is determined prior to performing any lift. This also means, based on the tag information, the right sling, in the proper configuration (or “hitch”) needs to be selected. Tags now provide information, indicating maximum load limits based on whether a sling will be used in a “basket,” vertical,” and “choker” hitch configuration



Types of Hitches

Each tag will show the above hitch illustrations with the maximum load allowable for that particular sling. Typically, the basket hitch has the greatest load limit capacity, followed by the vertical configuration, with the choker position having the least load capacity. As a rule of thumb, the basket capacity is typically twice the vertical, while the choker is 37.5% of the basket; however, these relationships can vary significantly depending of the angle, type of sling material and weather conditions. For instance in extreme cold, the load capacity of nylon slings can be significantly reduced (in some cases not even recommended) and therefore, while a basket configuration may be suitable, the other configurations may be unacceptable.



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In the OSHA Standard for Cranes and Derricks in Construction (29 CFR 1926, subpart CC), it is required that all persons performing rigging must be *qualified*. This means the person(s) assigned to perform rigging functions must either possess a recognized degree, certificate, or professional standing, or have extensive knowledge, training, and experience, and successfully demonstrate the ability to solve problems related to rigging loads. It is also typical of riggers to be knowledgeable in proper signal techniques and therefore, ensure effective communications with the equipment operator.

One of the most important tasks a rigger needs to perform is to inspect rigging equipment. This can be a very extensive process as a failed piece of rigging equipment could cause serious injury to him/herself, fellow workers as well as members of the general public. Prior to use, the rigger is required to perform a visual inspection. This implies that prior to each lift, the rigger examines slings, hooks, lifting points, etc., to ensure that there is no significant damage or wear, and that the working load limits (WLL) tag or markings are fitted and legible. At this point, if any defects are noted, the equipment should be removed from service.

As presented in OSHA's Crane and Derrick standard (29 CFR 1926.Subpart CC, specifically section 1926.1413 – *Wire Rope Inspection*), there are a host of physical defects and/or imperfections that a rigger needs to be aware before using wire ropes for rigging. These include:

- Significant distortion of the wire rope structure such as kinking, crushing, un-stranding (unraveling), *bird caging* (a distinctive condition where the cable strands unwind, causing a portion of the cable to open, creating a hollow space), as well as other signs of core failure or steel core protrusion between the outer strands.
- Significant corrosion needs to be recognized. However, the word “significant” is not further defined by OSHA, thus it is the judgement of the rigger to determine acceptability.
- Visible broken wires, such as noting six randomly distributed broken wires in one rope lay (a complete “revolution” around the ropes’ twisted helix design) or three broken wires in one strand in one rope lay, where a rope lay is the length along the rope. Or in rotation resistant ropes: Two randomly distributed broken wires in six rope diameters or four randomly distributed broken wires in 30 rope diameters.
- In pendants or standing wire ropes: More than two broken wires in one rope lay located in the rope beyond end connections and/or more than one broken wire in a rope lay located at an end connection.
- A diameter reduction of more than 5% from nominal diameter.

The responsibilities of a rigger are as numerous as there are scenarios: of which all cases require the full attention of the rigger. And while there is no sanctioned or certified training course recognized by OSHA or other Federal agency, it is the responsibility of the rigger's employer to ensure that the person(s) assigned as a rigger, understand their role by demonstrating extensive knowledge to the employer.

Kindness is the language which the deaf can hear and the blind can see.

Mark Twain

