Hazard Alert

Wire Rope Drum Capacity

Hazard Summary

Recently, a crew member on a fishing vessel had his lower arm and hand amputated by a new wire rope. The rope was installed at dock side and, while traveling, the doors were run out and hauled back to tighten the rope onto the drum. During the run out, loops passed over the side of the drum. The rope was secured, slack given to the rope to return the loops to the drum. The tie backs broke, the loops returned to their position outside and the workers hand was amputated. The primary cause of this accident was replacing an old rope with the same length of a larger diameter rope, resulting in too much rope on the drum.

Recommended Precautions

All drums have a maximum capacity to ensure the wire rope stays within the flanges of the drum or reel. To determine approximate drum capacity there is a common formula used that can be found in most metal trades handbooks.

Formula:

1. Add diameter of the drum to the depth of the flange (this gives total diameter)
2. Multiply this sum by the depth of the flange
3. Multiply the result by the distance between the drum flanges
4. Multiply this result by the drum reel capacity factor (found in metal trades handbooks)

E.g. The diameter of the drum is 16 inches, depth of the flange is 2 inches, and the distance between the flanges is 24 inches.

The drum capacity for 1” rope is: (16 + 2) 2 x 24 x 0.262 = 226 feet

Other considerations to ensure the drum capacity and installation are within design specifications:

1. At least three full wraps of rope remain on the drum in all service conditions.
2. The drum end of the rope should be anchored by a clamp supplied by the manufacturer.
3. The flange on a grooved drum should project two inches beyond the last layer of rope.
4. The flange on a flat drum should project three inches beyond the last layer of rope.

If unsure of drum capacity, have qualified person determine the capacity.