"Haggie Hints"

by George Delorme

Issue 6. 2004

Haggie North America - Meeting your hoisting needs!

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The Effects of a Kink

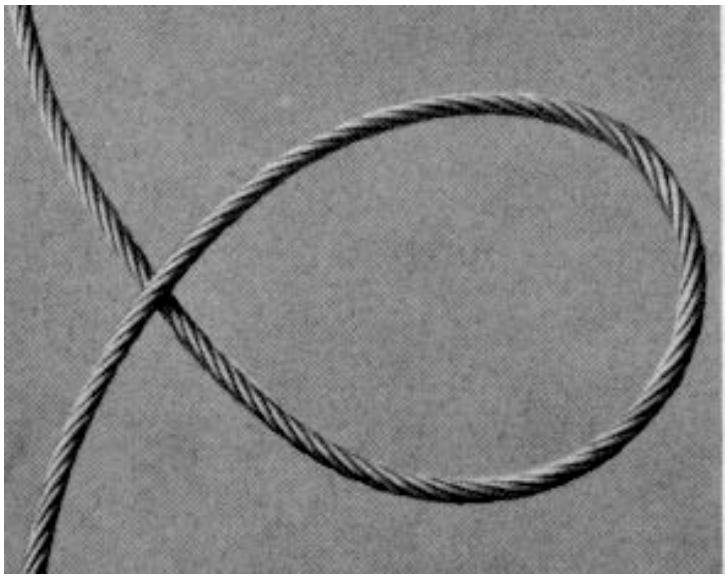
As was discussed in issue 5, most drum winders around the world use Flattened Triangular Stand (FTS), langs lay hoist ropes and torque is one of the characteristics that must be managed.

PROBLEM:

The torque in a 6 stranded hoist rope is ever present and if the load is released anywhere along the length, the rope will form a "pig tail" and if re-tensioned without manual intervention to control the loop, a "kink" will result. Tests have shown that as much as 50% of the strength can be lost at the kink.

CAUSE:

It is imperative the rope always has some tension to prevent a loop from forming. Once a loop is formed, the torque will cause the rope to "Pig tail". See photo below



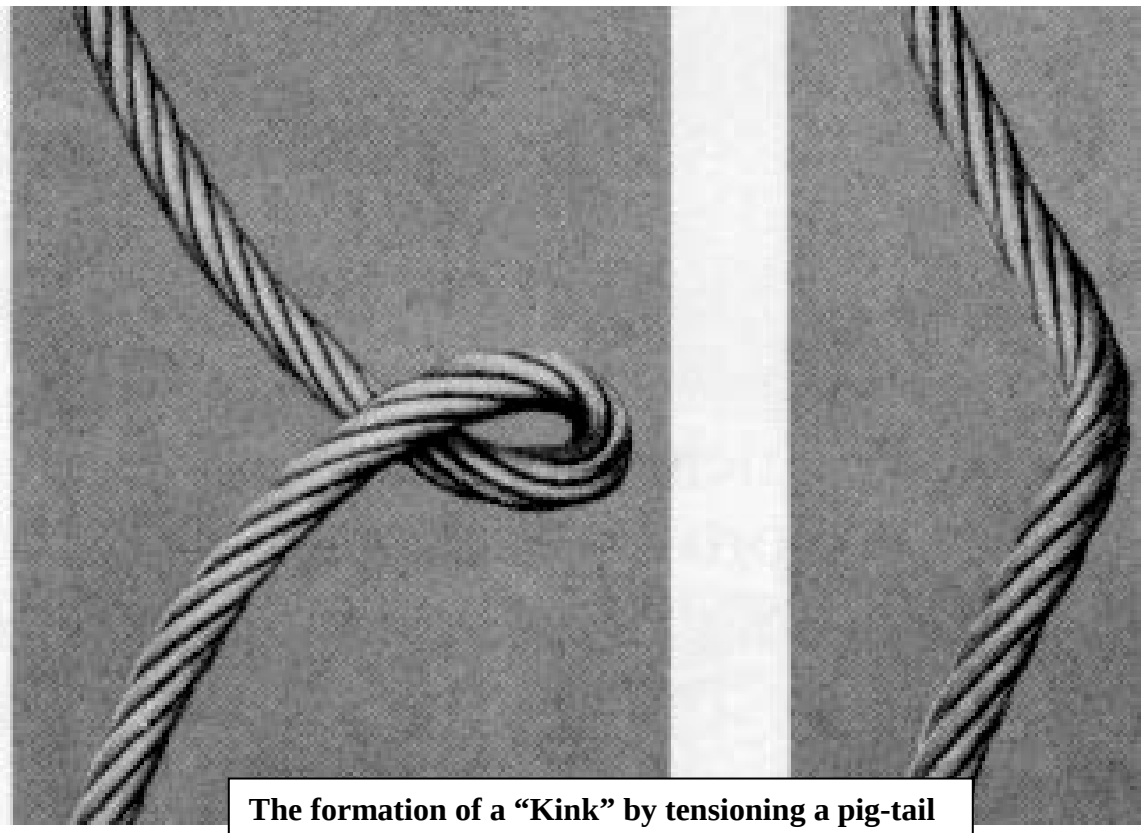
A single "Pig-tail"

In general, the most likely locations where a Pig-tail will be formed are above the conveyance when it is intentionally or unintentionally chaired and under the drum when the conveyance is chaired at the collar. During any installation or tensioning procedures, a person with communication capabilities should be positioned so that he can see under the drum.

As Issue #5 discussed, there will be more torque in the rope at the conveyance end when it is at the bottom of the shaft so particular attention should be paid to this area when chairing occurs in this position.

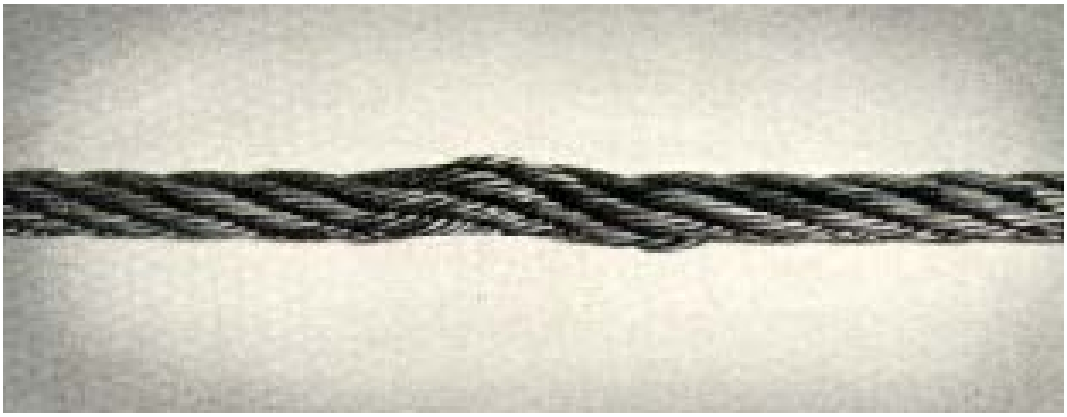
In itself, the formation of a pig-tail is not critical provided that the rope is not brought back into tension without manual intervention. Very often, the torque will cause the pig-tail to turn on itself several times but by using timbers, come-alongs and human muscle power, the pig-tail can be walked (untwisted) out as the tension is slowly re-applied.

The next photos show what happens if the tension is simply re-applied.



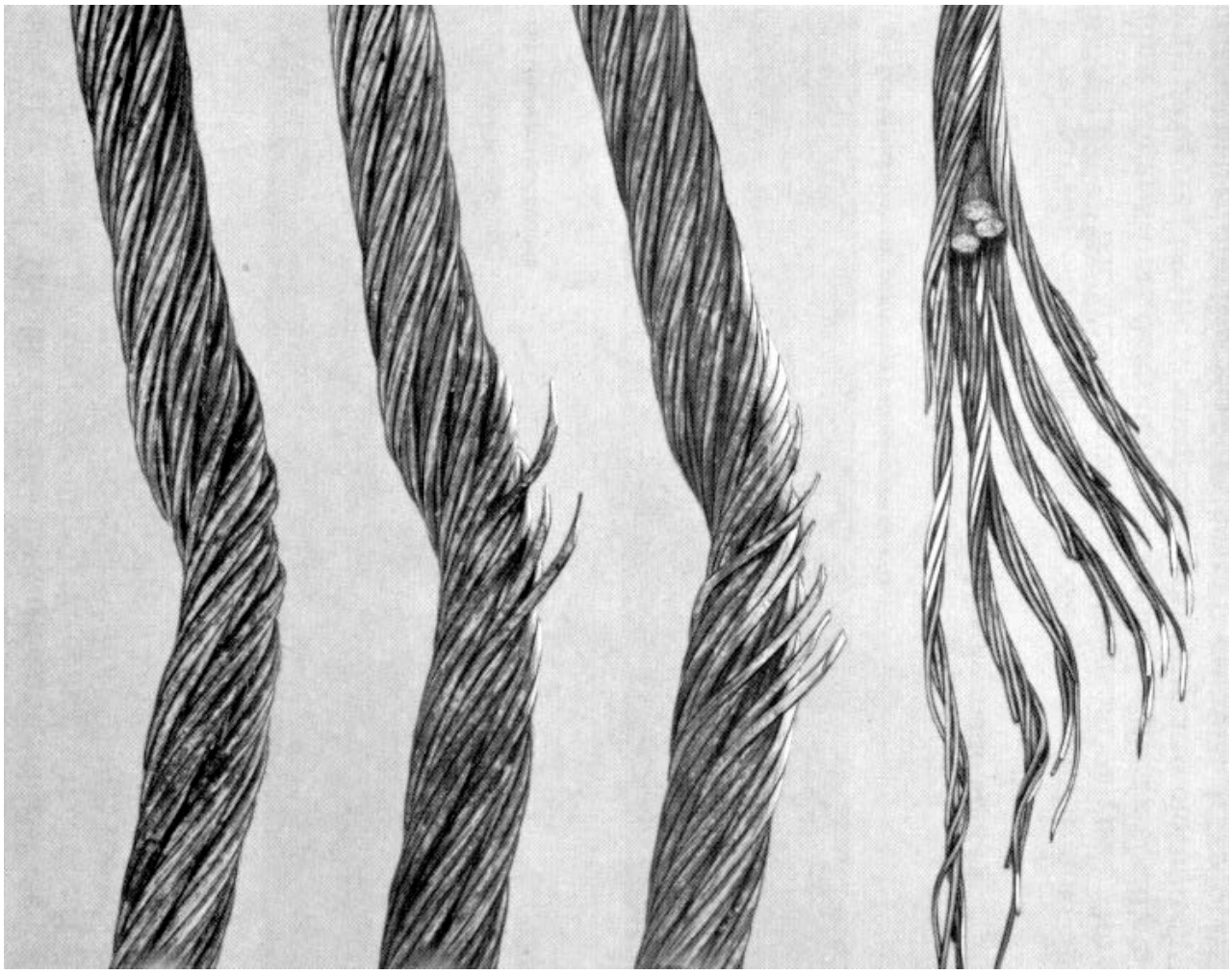
The formation of a "Kink" by tensioning a pig-tail

As can be seen, a kink not only shows a bend, but has a change in strand position i.e. the lay on three strands is shorter while the other three is slightly longer. The repositioning of the strands tells the difference between a kink and a sharp bend in the rope. The following photo shows a kink under some load. Note strand distortion.



Many years ago, in an attempt to classify the degree of kinks, an experiment was carried out in a testing lab. From the same rope, lengths of eight feet were cut and a variety of kinks formed in the samples. The idea was to photograph the kinks, ranking them from mild to severe, and then showing the resultant loss in strength. Unfortunately, the exercise failed because there was no consistency or pattern. However, there was one powerful lesson – **any kink can cause the rope to lose 50% of its strength immediately.**

The following photos show how the rope breaks at a kink.



REMEDY:

Any time a rope comes out of tension, an inspection should be carried out to insure that no pig-tails have formed. If they have, they must be manually untwisted so that the tension can be re-applied without tightening the pig-tail. If the tension is simply re-applied, a kink will result!

CONCLUSION:

The section of rope containing the kink must be removed from service. No kink is acceptable!