Wire Rope Inspection

Wire ropes are subject to deterioration during their lifetime and need inspection throughout their service life for safety of personnel and operations, economic and safe extension of rope life, and satisfying regulatory requirements.

A variety of plant equipment contains suspension ropes; crane hoist ropes, conveyor GTU ropes, drive cables, luff cables and many more. Deterioration of these ropes may occur for various reasons, some include; external and internal corrosion and abrasion, static and dynamic mechanical stress. Deterioration results in the loss of metallic cross-sectional area (LMA) and local faults (LF), such as broken individual wires and strands. Accurate information concerning the condition of a wire rope allows timely remedial actions that can increase rope life and ensure reliability of assets. The most effective method for determining the condition of wire ropes is via magnetic flux leakage (MFL) wire rope inspection.

ALS wire rope scanner utilises the MFL principle.

The magnetic head is mounted on a rope, with a diameter between 24 to 64mm, and travels along its length during the inspection. The magnetic field saturates the rope section in a longitudinal direction. Irregularities in the rope such as LMA and LF cause redistribution of the magnetic flux surrounding the rope. LF discontinuity in the rope, such as broken wire or corrosion pit, creates radial magnetic flux leakage and the LF sensor detects it as the rope passes through the sensor. The LMA sensor provides information about loss of steel due to missing wire, continuous corrosion or abrasion. This information is recorded by the scanner and analysed by our specialised operator to determine the condition of the wire rope.

Our software permits inspection information to be downloaded from the data logger allowing detailed analysis of charts including zoom, filtering and cut-off options, chart comparisons, modification of scanner settings and calibration. As a part of our service, ALS will provide a detailed test report including LMA and LF charts.
Specialist knowledge

Effective non-destructive inspection of wire ropes requires specialist knowledge and skills due to the variety of applications and conditions in which they are found. ALS Industrial has the ability to provide this expertise, in conjunction with the latest scanning technology, anywhere in Australia.

ALS Industrial also offers a variety of non-destructive testing, condition monitoring, reliability and integrity engineering, mechanical testing, metallurgy and inspection services.

Advantages

Some advantages of MFL analysis of wire ropes over the conventional visual inspection include:

> Ability to detect surface as well as sub-surface defects.
> Quantifiable and definitive results allowing trends to be identified.
> Capacity to test the entire length of rope from a single access point due to the pass through ability of the scanner.
> Provides real time data and further in depth analysis can be carried out in an office environment.
> Allows condition based change outs of wire rope rather than unnecessary time based change outs.
> Assists in minimising loss of production by removing the need to change wire ropes prematurely and aiding in the reduction of catastrophic failure.

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