Nondestructive evaluation (NDE) of steel ropes/cables is a challenging problem due to their long length (up to 400 ft) and the presence of multiple geometry features such as clamps and spacers. Southwest Research Institute® (SwRI®) has developed and field-deployed a magnetostrictive sensor (MsS®) guided wave system to examine steel ropes with diameters up to 6 inches.

Low-frequency L-mode guided waves are used to generate a pulse of compressional vibration in the rope in frequency range 5-30 kHz. The probe system utilizes either the electromagnetic acoustic transducer (EMAT) principle with large biasing magnets attached to the rope or low-profile flexible transducers (MsT) with iron-cobalt (FeCo) strip. This advanced test procedure allows signal calibration and identification of broken strands located close to the socket.

Advantages of MsS Guided Wave Testing

- Rope condition can be ranked good / medium / bad based on supported frequency, velocity of guided waves, and amplitude of indications near the sockets.
- The number of fractured wires in the rope can be estimated based on the amplitude of indications in reference to known reflectors such as clamps or socket end reflectors.
- The general condition of suspenders can be determined from MsS test data.
- MsS test results can be used to grade the condition of ropes and identify those requiring immediate action.
- Periodic MsS test results can be used to track condition changes with time.
We welcome your inquiries. For more information, please contact:

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