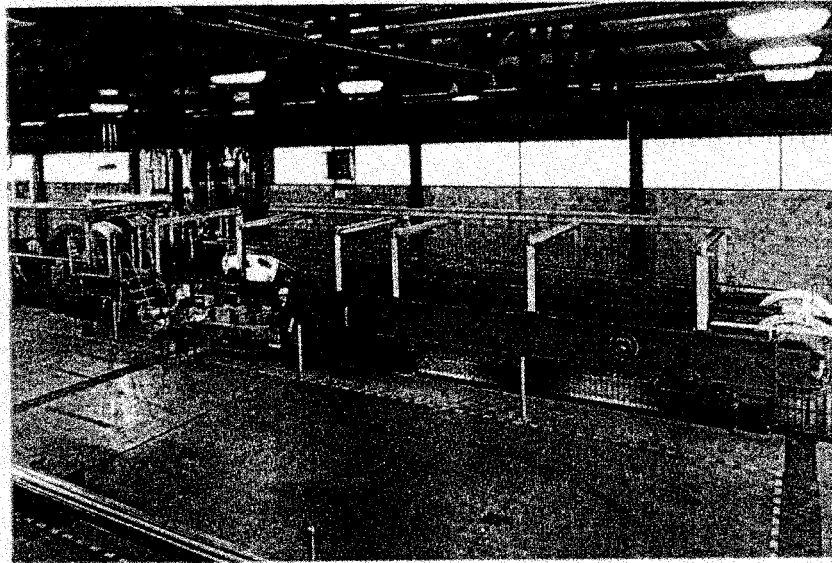


Wire Rope Retirement Criteria

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❏ Bending fatigue machine

Several of the current criteria for retirement of wire hoist ropes were developed by a U.S. Bureau of Mines committee in 1915. These criteria were based on the two main rope constructions in use then, but today, more constructions are in use and great improvements in steels and production methods have evolved. Bureau work to date has shown that the criteria involving rope diameter loss and outer wire diameter loss are not consistent for any one rope construction, and in fact, vary widely among constructions.

Another criterion that needs revision is that ropes should be retired when loss of strength exceeds ten percent as determined by non-destructive testing. Electromagnetic NDT is the most common method used today, and while it can measure loss of metallic area and can detect broken wires if there is separation of the ends, it cannot measure loss of strength. Loss of metallic area which can be measured by NDT devices does not correlate with the diameter and wire measurements. The Pittsburgh Research Center is working on developing the relationship among these parameters.

A new set of retirement criteria must be established. These criteria will have to be consistent among themselves for a single rope construction. It is highly likely that there must be a different set of retirement criteria for each rope construction of each group of rope construction. Modernization of the criteria would improve the safety of a great many people in addition to the U.S. mining industry, because retirement criteria in Canada, the U.S. Army and Navy, and others are largely based on the 1915 criteria.

The above is just a brief summary of a longer paper submitted by the author complete with calculations, tables and diagrams. If you are interested in the details please ask us for a copy of the complete text (21 pages, in English).