

# **Interactive Fatigue in Wire Rope Application**

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Two technically challenging applications – deep mine hoisting and deepwater offshore mooring – are reviewed in terms of the mechanics of rope response driven by challenges of increasing depth of operation. In both cases, practical and economic solutions lead to a need to understand and quantify interactions between different modes of fatigue loading (simplistically: bending, tension and torsion) which are traditionally segregated in laboratory testing. It is shown that, to assure reliable operation, first a thorough understanding of the mechanics is essential, but also a quantitative measure of the interactions between different modes of imposed loading is required. Some results are presented showing the dramatic effect of such interactions, and an explanation of some these effects is also advanced with supporting experimental data.