

An Industrial Strength Solution | Enidine Wire Rope Isolator Application

By: Luis Rodriguez

Situation Overview

A leading manufacturer of operator cabs was looking for a better solution to isolate the units from harmful vibration. These cabs are installed in hydroelectric, petrochemical, marine and other industries with varying environmental conditions. The cabs needed to be designed to operate efficiently in any of these environments.

The manufacturer was in the process of designing the cabs with natural rubber elastomeric isolation mounts, but was looking for a more robust solution. In the past, they had used elastomeric isolators to mount the seat to the floor of the cab, but have now decided to isolate the entire cab from the factory floor. This new approach would protect not just the operator, but all sensitive electronic equipment and the structure itself from harmful vibration. But the environment outside the cab included chemicals, contaminants, and temperature extremes that made it more challenging than the original seat mount application.

The manufacturer searched the Internet for alternative solutions and found the ITT Enidine Inc. website. They reviewed the vibration isolation applications section on the site and compared their cabs to the examples of computers and electronics using wire rope isolators. They contacted ITT Enidine Inc. for advice and a solution to their problem.

Application Opportunity

The manufacturer's main objective was to eliminate vibration transmitted through the control cab from the plant equipment and various other environmental conditions. Vibration from the plant equipment ranged from 30 Hz to 40 Hz. This vibration created stress and fatigue problems for the cab and hampered the productivity of the operator. The weight of the cab with the operator averaged 5,600 lbs and was usually hard mounted to the floor.

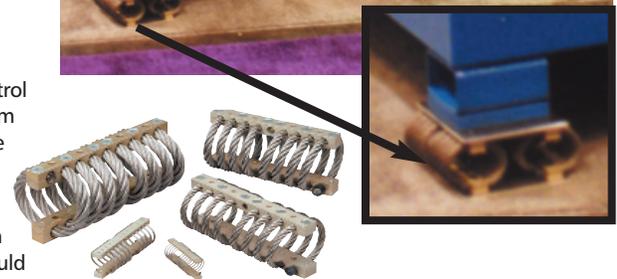
Originally, the redesigned cab included elastomers, but their life expectancy under harsh environmental conditions was a concern. In hydroelectric environments the elastomer would have to withstand outdoor conditions such as ozone, acid rain, and temperature changes. Under petrochemical conditions, non-compatible chemicals and oil/gasoline can degrade the elastomeric material. Marine applications would require ozone and salt water resistance. The elastomers provided excellent vibration isolation performance inside the cab, but varying conditions outside the cab would negatively effect their performance.

Each of these conditions would cause the elastomeric mounts to decay, resulting in costly replacement. The customer required a simple solution that would offer long, maintenance free, consistent performance under extreme temperature conditions.

Project Solution

The ITT Enidine Inc. solution for this application was the use of eight WR20-200-08S wire rope isolators per cab, with two isolators located at each corner of the cab. The wire ropes were used in a compression-mounting configuration and significantly reduced the vibration frequency to the operator. This resulted in increased efficiency, productivity and the amount of time the operator could comfortably spend in the cab.

When compared to elastomeric mounts, wire rope isolators can support a static load over a longer period of time while retaining their isolation properties. This feature enabled the wire rope isolators to be mounted under the cab, providing consistent vibration isolation performance over extended periods of time.



Project Results

The customer was impressed with the resiliency of the wire rope isolators under extreme conditions. The wire rope isolators provide maintenance free, long life operation. They are less susceptible to damage and fatigue than the traditional elastomeric mounts used inside the cab. The wire rope isolators provide a fail-safe system, which was not considered in the initial design. The manufacturer has not standardized the ITT Enidine Inc. wire rope isolators on all new cabs manufactured and is planning to retrofit existing cabs in the field.

A simple design remedied the vibration and environmental concerns. Wire rope isolators addressed the specific requirements and met the manufacturer's objective successfully. ITT Enidine Inc. provided a solution to the problem with an industrial strength product and superior technical support.