Enidine by Design

Protecting Sensitive Electronics at Sea

Enidine Custom WR16 and WR20 Series Application

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Situation Overview

Whether cruising along in rough waters or under siege by enemy fire, US Navy ships and their sensitive combat electronics equipment must survive intense shock and vibration inputs. Non-isolated or improperly isolated equipment could put the crew and the vessel in extreme danger.

While designing a new ship-launched missile weapon system, a major US military contractor discovered a problem with their isolation system during qualification testing. Under simulated combat conditions, a competitor's off-the-shelf wire rope isolators failed to safeguard the equipment from high-input shock forces. Since the isolators were insufficient for this amount of force, the shock energy was transmitted directly to the electronics, causing severe damage. The customer asked Enidine to review the application and recommend wire rope isolators that would assure adequate isolation.

Application Data

The customer's equipment included a bay of five electronics cabinets. Each cabinet needed to be isolated against shock inputs (Mil-S-901) and vibration inputs (Mil-Std-167). The existing design envelope would need to be maintained. Special mounting techniques were needed to prevent the cabinet from breaking away from the ship's deck after the shock. Material stress analysis would need to be conducted to determine the strength of each isolator bar.

Other necessary design considerations:
- 14 Hz soft deck
- 35 G shock input
- Cabinet weights 800-1200 lbs

Product Solution

Using Enidine's engineering capabilities and previous experience in working with Navy shock and vibration problems, Enidine designed and manufactured special WR16 and WR20 Series wire rope isolators to meet the necessary requirements. Each cabinet was fitted with six wire rope isolators, four support units mounted under the cabinet in compression, and two stabilizing isolators mounted at the top-rear in the roll axis. Sturdy mounting hardware was used to secure the mounts to the deck and cabinet. To prevent deformation of the mounting bars under high loading conditions, special high-strength (7075-T6) aluminum bars were designed. The result was a powerful isolation system that met the Navy's severe shock requirements.

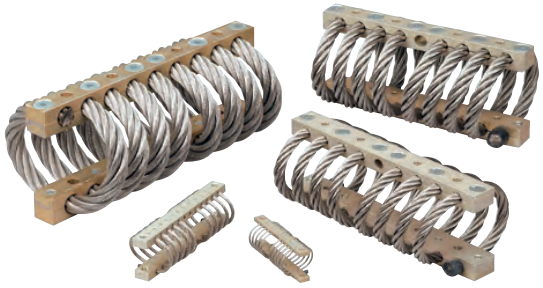

Photo courtesy of Gibbs & Cox, Inc.

Project Results

To meet the customer's tight testing schedule, Enidine designed, manufactured, and shipped a complete set of wire rope isolators to the customer in four weeks. The isolators were installed on the cabinets, and barge testing was successful, qualifying the weapon system for shipboard use. The units were able to withstand the high impact forces and protect the equipment from damage. By using wire rope isolators on Navy shipboard electronics equipment, Enidine assured continuous operation during severe shock and vibration inputs.

Although standard wire rope isolators are widely available, Enidine's staff of competent engineers can offer a complete engineered solution when the application demands it. Enidine has become the approved supplier of wire rope isolators for this major weapon system.

In addition to defense applications, wire rope isolators are effective in isolating shock and vibration in other areas, such as mobile electronics, where sensitive equipment must be protected.

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