



CUSTOMER:  
**BAE Systems**

INDUSTRY:  
**Defense Electronics (Marine)**

PROJECT NAME:  
**COBLU Rack-Assembly  
 Structural Analysis**

CUSTOMER LOCATION:  
**Nashua, New Hampshire**

**OVERVIEW**

The Cooperative OUTBOARD Logistics Update (COBLU) system is an upgrade of OUTBOARD countermeasures detection and analysis system currently deployed on U.S. and British Royal Navy ships. OUTBOARD is a shipboard radio signal detection, acquisition, data management, and direction-finding system that provides early warning and targeting of surface ships. The enhanced COBLU system features advanced methods of detecting, sorting, and tracking hostile emitters to provide intelligence indication and warning.

BAE Systems supplies a shipboard-mounted rack assembly as part of the COBLU system. This assembly consists of a rack with several commercial off-the-shelf (COTS) and custom units slide mounted into the rack. The rack assemblies are mounted on isolators in shipboard installations. BAE Systems was interested in understanding the performance of rack corner welds due to static, shock, and vibration loading. BAE Systems asked ATA Engineering, Inc., (ATA) to perform a structural analysis of a shipboard-mounted rack assembly to determine how the corner welds affected the structural integrity of the rack.

**ATA SUPPORT INCLUDED:**

- ▷ Created detailed finite element models (FEMs) of welded and unwelded configurations of the assembly.
- ▷ Applied transient test excitation data to the rack FEMs.
- ▷ Predicted displacement and stress response to these transient excitations for both configurations.
- ▷ Compared displacement results to test data to determine if model generated similar responses as the test article, and modified interface spring stiffness to match data.
- ▷ Performed bolt analysis of all major fastener interfaces for both configurations.
- ▷ Identified structural design margins and potential design upgrades.

