Success Story: Aegis Combat System Fire-Control Hardware Cabinet

Shock-Proof Cabinets Modernize Aegis Combat System

When the U.S. Navy sought to **modernize its Aegis combat system's fire-control hardware**, it faced the challenge of replacing legacy equipment racks with new digital cabinets that could fit existing spaces and survive the harsh naval environment. The Aegis MK 99 fire-control system uses Data Converter Cabinets as the critical interface between the ship's radar and its missile launchers janes.com. These cabinets had to be **shock-proof** for shipboard use and shielded against the high-power radar's electromagnetic emissions. The technical hurdle was to design an updated enclosure that maintained or improved performance without compromising on ruggedness.

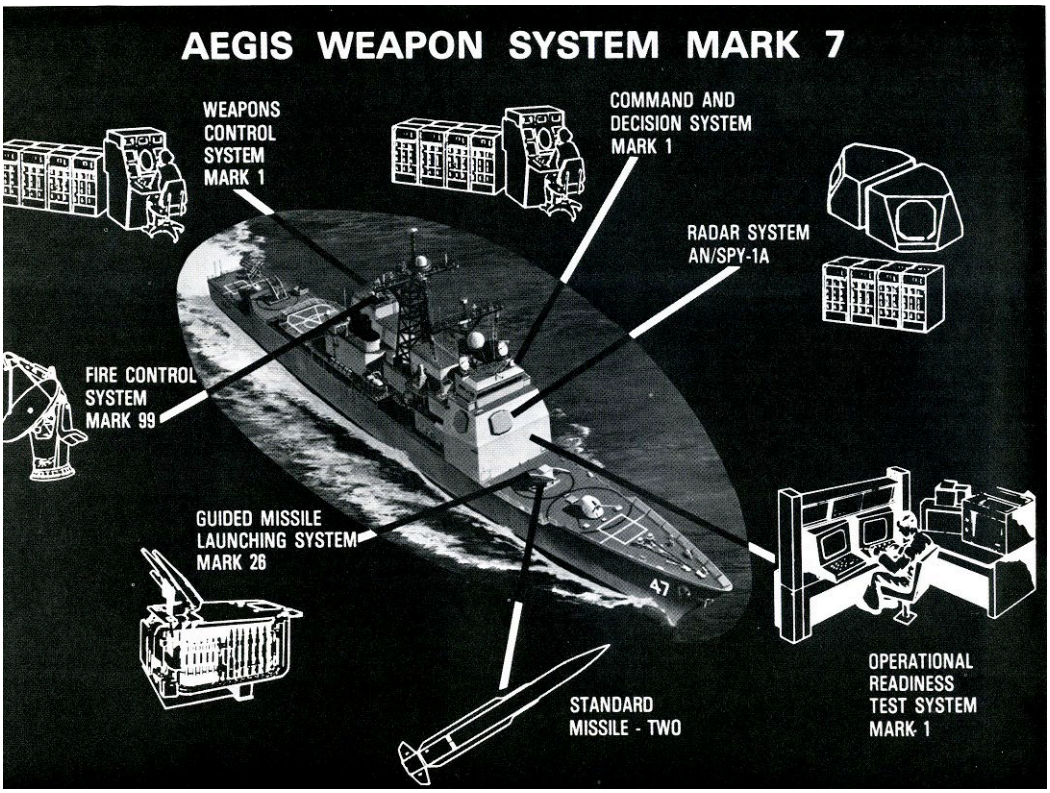

Figure 1 Aegis Overall System Diagram

Solution: Optima Stantron provided a **modern MB-Series bolt-together cabinet** engineered as a drop-in replacement for the older units. This enclosure is a **hard-mount design** (no floating isolators) built with reinforced framing to directly withstand ship shock. Using a **weld-free aluminum structure** with internal bracing, the cabinet can handle heavy shock and vibration loads. It was qualified to **MIL-S-901D** ship shock standards through analysis and testing, ensuring it would survive the same blasts as the original equipment. The enclosure also features conductive gasketing and filtering to meet **MIL-STD-461** for EMI, given the close proximity to high-energy radar and missile systems.

- **Compact footprint:** Dimensioned to fit the existing Aegis equipment bays, easing integration into guided missile destroyers.
- **Structural rigidity:** Hard-mounted frame with **reinforced joints** survives direct shock without deformation. (No welds means fewer failure points under stress.)
- **Shock and vibe tested:** Certified to **withstand high-impact shock (MIL-S-901D)** and continuous engine-room vibration, protecting the fire-control electronics.
- **EMI shielding:** Conductive seals and cable filtering ensure compliance with **MIL-STD-461**, preventing radar and radio interference.

Figure 2 Optima MB Ultra-rugged bolt together cabinet

Outcome: By deploying these **shock-proof cabinets**, the Navy extended the Aegis system's service life with state-of-the-art digital hardware in a rugged package. The upgraded Data Converter Cabinets now reliably link the Aegis radar and missile control systems even under

battle shock conditions. This modernization improved system performance and **maintained full combat survivability**, all while avoiding a costly redesign of ship infrastructure. Optima Stantron's solution delivered an elegant balance of new technology and proven toughness—**optimizing performance, mechanical design and versatility to meet the fleet's requirements**.