

CASE STUDY

Submarine Tactical Integrated Digital System (TIDS)



SUMMARY:

Submarine Torpedo Network Secured by Shock-Isolated Racks

A submarine combat-system upgrade demanded an enclosure solution as stealthy and resilient as the vessel itself. The program centered on integrating the latest Mk 48 Mod 6 Advanced Technology heavyweight torpedoes into a submarine's Tactical Integrated Digital System (TIDS). TIDS is the onboard network that distributes sensor and combat data to key control stations throughout the sub congress.gov.

CHALLENGE:

The electronics racks had to absorb undersea shock (from torpedo launches or nearby explosions) and operate silently and reliably in the tight confines of a submarine. Additionally, they needed to meet strict naval EMI limits to avoid interference with sonar and navigation systems.

SOLUTION:

Optima Stantron delivered MB-Series shock-isolated cabinets tailored for the submarine environment. Each cabinet was outfitted with a custom shock isolation system – a set of elastomeric mounts tuned to submarine shock spectra – effectively creating a “floating” rack within the hull. This design protects mission-critical processors and data links from the jarring forces of undersea explosions or sudden maneuvers. The enclosures were built to MIL-S-901D Grade A shock standards (for vital ship equipment) and tested on shock platforms to verify that even heavyweight torpedo firings won't disrupt the electronics. To address space and cooling constraints, the racks featured optimized airflow paths and were bolted into existing foundations with minimal modification.

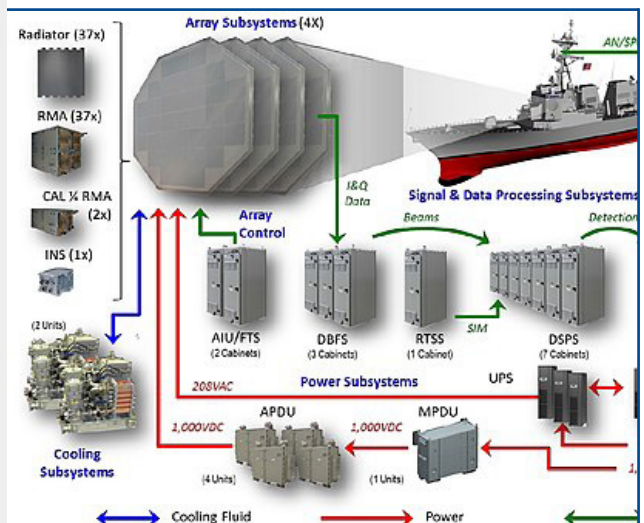
- **High-impact shock protection:** Shock isolator mounts decouple the equipment from the sub's hull, ensuring survival of electronics during depth charge shocks or weapon launch transients.
- **Rugged modular build:** Bolt-together aluminum panels withstand pressure and vibration; each cabinet meets MIL-S-901D naval shock and submarine-specific durability requirements.
- **EMI/EMC compliance:** The design includes RF gasketing and filtering to pass MIL-STD-461 tests, preventing electromagnetic noise in the submarine's sensitive acoustic environment.
- **Compact and maintainable:** The cabinet dimensions and access panels were customized for submarine spaces, allowing easy maintenance in cramped quarters without sacrificing strength.



Figure 1 Rugged and Shock Isolated TIDS Cabinet

Outcome:

The shock-isolated TIDS cabinets have significantly hardened the submarine's combat system. Even during extreme events undersea, the networked sensors and fire-control electronics remain stable and operational, which is crucial for the safety and effectiveness of torpedo engagements. This success story highlights how Optima Stantron's engineering ensured submarine fleet readiness: by combining space-conscious design with robust shock isolation, the new enclosures enhanced the Navy's undersea warfare capabilities while upholding all requirements for stealth, durability, and mission continuity.



Elma Electronic

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Contact Info

510.656.3400
sales@elma.com
44350 S. Grimmer Blvd.,
Fremont, CA 94538

www.elma.com

