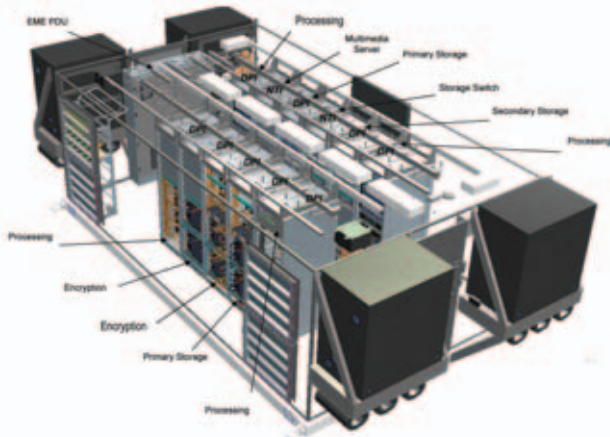


Electronic Modular Enclosure (EME) Zumwalt Class Destroyer Program



Innovative enclosures dramatically reduce the time and cost to build and deploy Zumwalt combat systems.

Benefits

- Readies sensitive COTS- and GOTS-based systems for combat conditions
- Creates an optimal environment for equipment while insulating combat systems from shock, noise and EMI
- Improves combat system reliability — and enhances ship survivability
- Shields noise and electronic signatures generated by combat system equipment, reducing chance of detection by the enemy
- Streamlines installation by enabling equipment to be configured, tested and installed in the factory

A Modular Approach to Combat Systems

To meet DDG 1000 Zumwalt Class Destroyer program requirements for cost-effectiveness, stealth and ship survivability, Raytheon has transformed the way combat systems are deployed. Electronic Modular Enclosures (EMEs) encapsulate equipment in standardized shelters designed to withstand the most rigorous battle conditions. An innovative concept for ship-based combat system implementation, EMEs not only make it possible for commercial-off-the-shelf (COTS) and government-off-the-shelf (GOTS) equipment to be used instead of more costly custom systems, but also streamline combat system installation, integration and testing.

Ready for Combat Conditions

An EME is a protective enclosure of up to 11.8 x 35 feet

that contains a set of specific electronic combat system components. Shock isolation mounts, which can be customized to meet the requirements of the equipment inside each EME, shield the equipment from damage or disruption caused by typical ship vibration and from the extreme shock events encountered during combat. Similarly, acoustic dampeners minimize the noise generated by the racks of electronic components that comprise the combat system, helping to prevent ship detection by an enemy. An EME also protects combat systems against extreme cases of electromagnetic interference (EMI) and ordinary EMI caused by other ship equipment.

An EME further safeguards mission-critical combat systems by providing a self-contained environment with its own controls, eliminating

the need for separate cooling systems or other special environmental control equipment. The built-in air-cooling system monitors temperature and humidity, and is designed with extra capacity to accommodate future system expansion.

In addition to managing its internal environment, an EME also controls its power needs through its own power distribution unit. Each enclosure requires no more than two external power inputs to connect the EME to the ship's power system.

Flexible Interior Configuration

EMEs provide combat system designers with essential flexibility. While EMEs leverage standard cabinets for placement of equipment, cabinet layout within the enclosures can be tailored in infinite ways to meet specific combat system requirements.

Electronic Modular Enclosure (EME)

Multi-site Deployment

Available in five standard sizes/configurations, EMEs ease the process of deploying redundant systems and components, reducing the risk of a single point of vulnerability. The Zumwalt contains 16 EMEs located throughout the ship, which minimizes the impact of ship damage on the combat system and enables the crew to continue its mission in a battle situation.

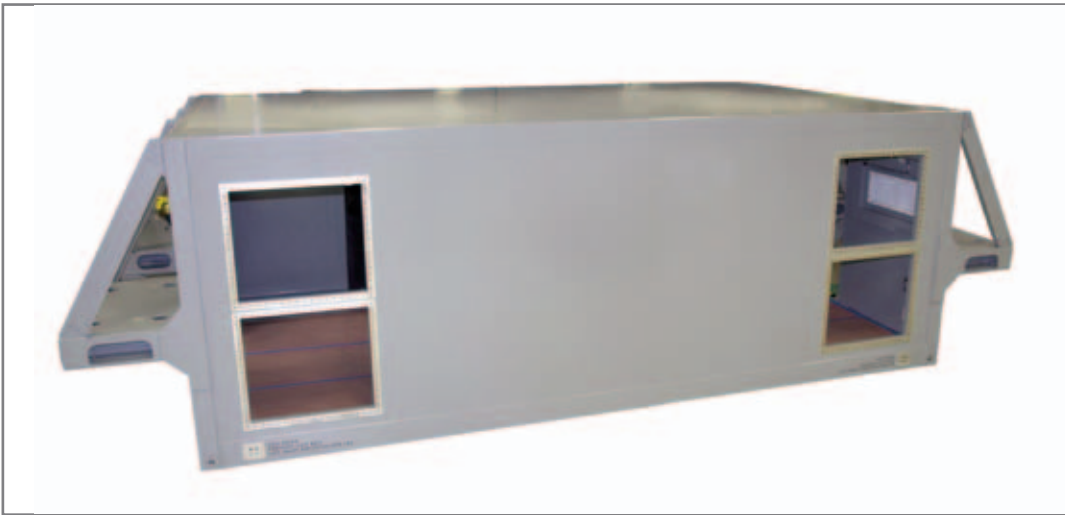
Enabling Factory-based Integration and Testing

The innovative EME approach allows ship-based combat systems to be more cost-effectively deployed and ensures much less time is needed to outfit a new ship with a state-of-the-art combat system.

Traditionally, combat systems have been assembled at the shipyard and tested after installation on the ship, adding to

the time needed to build a combat-ready ship. Because each EME contains all the components of one or more specific combat systems, EMEs make it possible for combat system designers to install, configure and test all components and systems at the factory. As a result, EMEs and their contents can be packaged and shipped as integrated units.

This approach also limits the need for shipbuilders to have detailed knowledge of combat systems. Shipyard personnel need only to install the EME unit on its designated foundation within the ship and connect the EME to the ship's power. Designers can even pre-configure and test a ship's entire combat system in a set of enclosures and then store the EMEs for rapid deployment at the proper point in the shipbuilding process.



Electronic Modular Enclosure Highlights (Each EME)

- **Shock isolation mounts** to protect sensitive equipment from typical ship vibration as well as combat-based shock
- **Dampening systems** to reduce the noise generated by combat system equipment and protect against EMI
- **Built-in cooling system** for heat removal and air circulation, with extra capacity to allow for system expansion
- **Physical barriers and electronic security features** that limit access to authorized individuals
- **Power distribution units** with simplified external power interface — up to two power inputs per enclosure
- **Standard electronics cabinets** that are both modular and configurable

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