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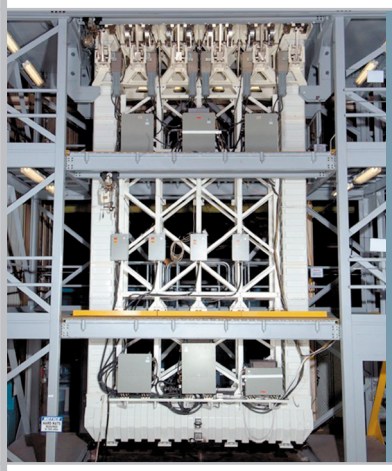
MK 57 Vertical Launching System

Zumwalt Class Destroyer Program



The MK 57 Vertical Launching System enables rapid integration of new and existing missile systems without complex and costly modifications to launcher hardware or software.

Benefits

- Open architecture for maximum flexibility and adaptability
- Separate launcher and weapon functionality allowing easier weapon upgrades
- Ample capacity for current and future missile size and weight
- Backward compatibility for existing encanistered missiles
- Reduced maintenance, needing fewer personnel
- Improved gas management system accommodating more powerful rocket motors
- Scaleable to multiple sea-based and shore-based platforms

The MK 57 Vertical Launching System (VLS) is a versatile, open architecture solution that delivers significant warfighting and lifecycle advantages, making this launcher an ideal candidate for use in a wide variety of maritime and shore-based installations. The first shipboard deployment of the MK 57 VLS is planned for Zumwalt, the U.S. Navy's next generation multimission destroyer.

Open Architecture Solution

Among the first applications to comply with the Navy's Open Architecture (OA) concepts, the MK 57 launcher exploits the common hardware and software architecture implemented in the Total Ship Computing Environment (TSCE), initially developed for Zumwalt. This delivers a significant opportunity to lower the costs of introducing new weapons.

For example, the combination of open architecture and extensive modularity of the MK 57 VLS enables integration of new and existing missile systems without requiring complex and costly modifications to the launcher control software or the launcher hardware. This approach dramatically reduces integration costs associated with new missile control and interface software in several ways:

- Reduces the effort required to add new weapons
- Eliminates the cost of removing weapon-specific technologies from the launcher
- Minimizes the need for regression testing associated with modifications

Increased Capacity to Support Larger and Heavier Missiles

The MK 57 VLS is designed not only to support existing

VLS encanistered missiles but also provides for growth in missile volume and weight.

The MK 57 VLS is designed to accommodate both current and future missile technologies without major launcher modifications. It is flexible enough to handle lighter missiles, such as the Evolved Seasparrow, as well as the larger, heavier missiles required for ballistic missile defense.

Extensive Electronic Modularity

The MK 57 VLS is comprised of an advanced weapon-centric architecture that separates weapon-specific functionality from launcher-specific functionality, contributing to easier, more cost-effective integration of current and future missile designs.

Canister Electronic Unit (CEU) — The CEU is the key to providing an "any missile, any cell" architecture required by the Navy for its launching systems. Similar to an adapter, the CEU interfaces with a specific encanistered missile, linking the missile to the ship's combat system. In this way, new missile-types can be inserted into inventory rapidly, without costly alterations to the launcher and only minor updates to the combat systems. When adding a new missile to the launcher, only the CEU and weapon-specific software must be changed; there is no need for physical modification to the launcher itself.

Module Controller Unit (MCU) — The MCU interfaces the MK 57 VLS to the TSCE. The MCU includes resources to manage the 4-cell launcher module and launcher equipment, to monitor missile and canister activity, as well as to detect and report faults.

Power Distribution Unit (PDU) — The PDU allows the efficient transfer and monitoring of ship's power to both the launcher and its missiles.

Hatch Control Assembly (HCA) — The HCA (Consisting of a Hatch Control Unit (HCU) and Hatch Drive Unit (HDU)) provides advanced motion control and servo drive technology required to actuate the launcher's missile and exhaust hatches.

Innovative Gas Management System

The robust MK 57 VLS gas management system can accommodate new missile designs having up to 45 percent greater rocket motor mass flow rate than current-generation rocket motors. The unique symmetric geometry of the u-shaped gas management system facilitates the egress of gases, while minimizing flow into witness cells and reversed flow into the active cell. Elimination of a missile deluge system significantly reduces maintenance and personnel requirements, and protects against accidental missile wet-down.

Specifications

MK 57 VLS Physical Dimensions (4-cell Module)	
Height:	26′
Length:	14.2′
Width:	7.25′
Weight:	33,600 lb
Canister Width:	28″
Canister Length:	283″
Max. Encanistered Weight:	9,020 lb

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