Aegis Ashore Afloat (AAA)

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The U.S. Navy currently has two active Ballistic Missile Defense (BMD) platforms, the Aegis Destroyer (DDG-51) and Aegis Cruiser (CG-47). The upcoming Destroyer variant, DDG-51 Flight III, will be the first ship to incorporate a new 14-foot Air and Missile Defense Radar (AMDR), which is approximately 30 times more sensitive than the SPY-1D radar found onboard DDG-51 Flight IIA. While a significant improvement, the 14-foot AMDR does not solely achieve the Navy's objective performance characteristics due to limitations with the DDG-51 design. A 22-foot AMDR array, planned for the now-canceled CG(X) class, was originally sought to improve BMD capability and address the evolving ballistic missile environment. Therefore, a potential capability gap exists in the area of BMD radar coverage. This study sought to provide a timely, cost-effective solution to enhance the radar capability of our current platforms by exploring the feasibility of installing the existing Aegis Ashore system, excluding interceptors, onboard a commercial containership.

The mission profile for Aegis Ashore Afloat (AAA), as the concept is called, involves AAA working in close partnership with other Aegis platforms to provide additional look capability in support of BMD. AAA would pass targeting data to missile platforms, extending their coverage range. AAA could also provide final illumination when necessary, effectively increasing the number of missiles a platform is able to launch.

All systems needed to support both Aegis Ashore and the additional crew are supplied independently from the host-ship via standard containerized modules. These modules include everything from electrical power generation, damage control gear, and reverse osmosis units to recreation rooms, barber facilities, and garbage processing stations. The modular concept comes, in part, from DARPA's Tactical Expandable Maritime Platform (TEMP) program. The design ensures that all containers are structurally stable and accessible underway while meeting or exceeding all Navy crew habitability requirements.

The baseline ship for the feasibility study was a 1,040 twenty-foot equivalent unit (TEU) size containership. Designed to ensure the host-ship would continue to satisfy commercial strength, stability, and watertight integrity requirements, the only containerized systems installed below-deck were fuel tanks, "dirty water" tanks, and watertight TEUs provided for additional reserve buoyancy. After modeling and analysis, this study concludes that installing an Aegis radar system on a relatively small containership is feasible. The use of larger containerships would only improve the AAA concept through the addition of capability.

The preferred configuration for AAA has the Aegis Ashore deckhouse located at the bow of the containership, with only the pilot house limiting radar coverage in the aft sector. The additional support systems, including crew habitability, are located between the Aegis Ashore deckhouse and the flight deck, with some select systems located on the container bays just forward of the containership pilothouse. By design, the installation package is modular and nearly independent of all host-ship systems, which allows AAA to be installed on a range of commercially available containerships.

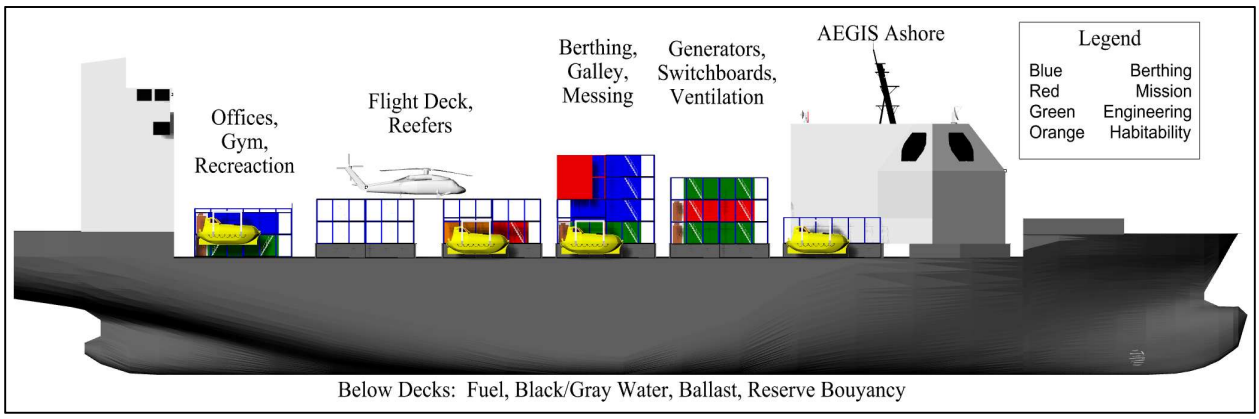

Figure 1: Final AAA Arrangement

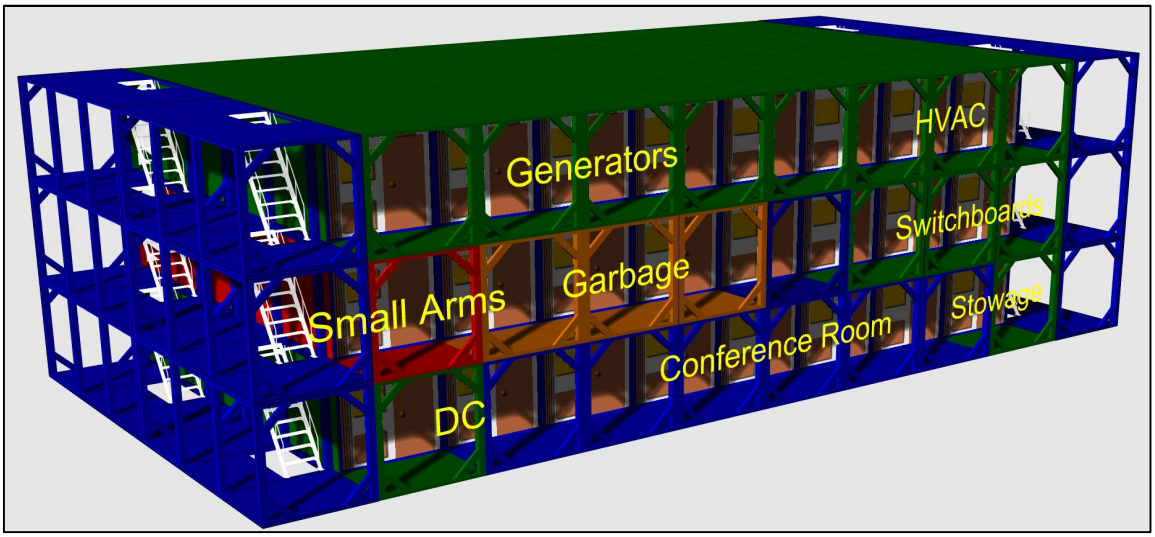

Figure 2: Example of one 40-foot modular support section

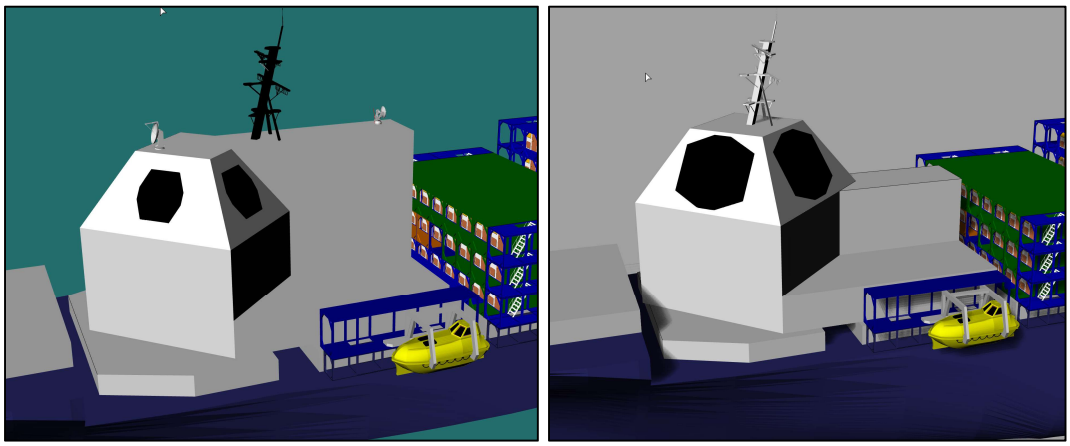

Figure 3: A concept comparison of the 9-foot (current Aegis Ashore) and 22-foot (CG-X) arrays