

DDG-51 FLT IIIA ADC VARIANT

What will assume ADC responsibility when CGs decommission?

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The Ticonderoga Class Cruiser fulfills the Air Defense Commander mission for the Carrier Strike Group. In the 2030s the CG and first of the Arleigh Burke-Class destroyers will be decommissioned resulting in the loss of a dedicated ADC platform along with a reduction in surface Vertical Launch System capacity. The Navy originally planned on a CG(X) ship to assume ADC responsibility but the program was cancelled in 2011. With no active program currently existing to provide this capability this study explored converting a DDG-51 FLT III into a dedicated ADC platform.

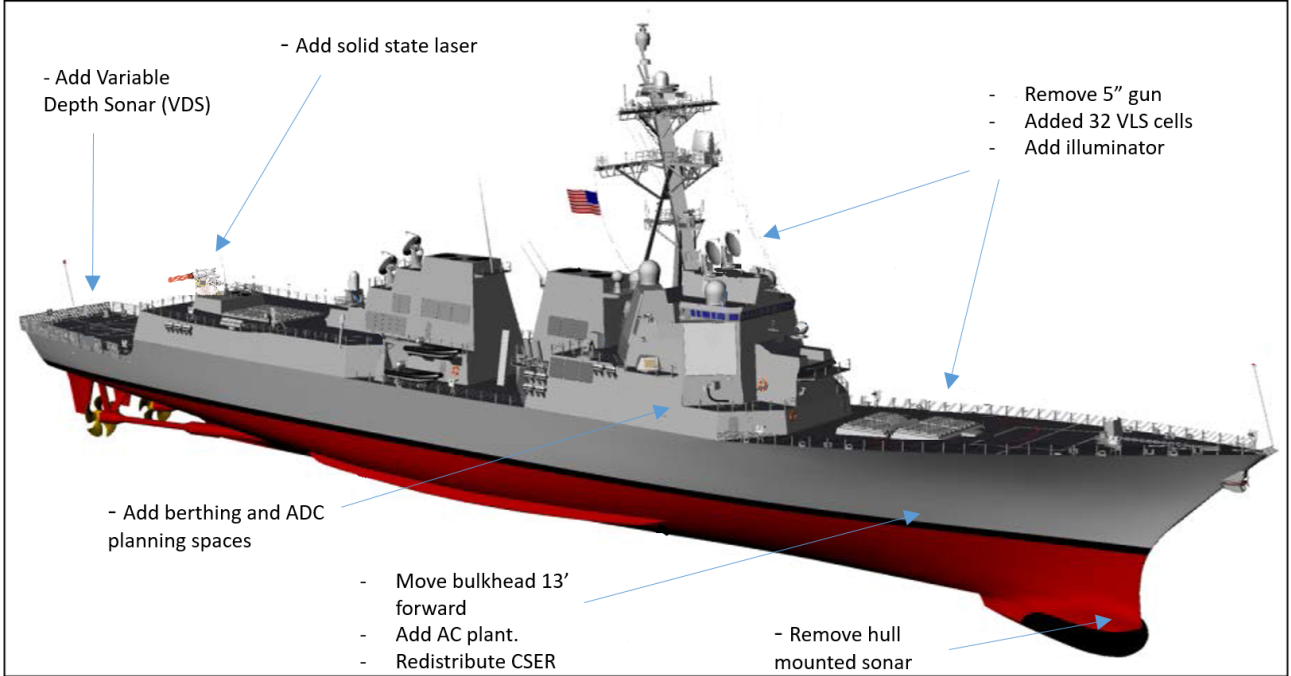
DDG-51 is capable of assuming the ADC role for short periods of time. DDG-51 requires specifically trained personnel, an O-6 CO for Command and Control, and dedicated planning/debriefing spaces in Combat Information Center.

NAVSEA 05D conducted the Destroyer Payload Module study in 2016 to evaluate the feasibility of adding ADC, VLS cells, and Space Weight Power and Cooling (SWaP-C) margin for future systems. The DPM study provided thorough and robust options for adding capabilities with a 53' plug. Adding the plug impacts survivability in a negative way, specifically the floodable length.

This study differs from the DPM report in configurations explored. We analyzed feasibility of adding ADC capability with either zero modifications to the hull or a 13' plug, resulting in decreased Non-Recurring Engineering and construction costs. To accomplish adding ADC capability, two systems and spaces were examined to be repurposed, the MK45 5" gun and the AN/SQS-53C hull mounted sonar. The loss of these capabilities could be offset with a low cost medium range strike missile, which was called out as a required future asset in the 'Distributed Lethality' article, along with a towed Variable Depth Sonar.

Our "Preferred Variant" consisted of the DDG-51 FLT III hullform with 5" gun and hull mounted sonar removed. A manning analysis was performed to determine the impact to configuration on manning, resulting in an overall increase of five personnel. Extensive modifications occurred in the forward 1/3 part of the ship to accommodate ADC planning spaces, berthing, and an additional AC plant. The only structural change required was moving a bulkhead forward 13' to allow for a 64 cell VLS module instead of the installed 32 cell module.

Our "Preferred Variant" provided ADC capability, 128 VLS cells, 20% > service life allowance margin for electric and cooling, 10% > service life allowance for displacement, and 0.55' KG margin. This study assumed a 14' AMDR array. It is feasible to convert a DDG-51 to handle ADC capability, however, an analysis of whether a larger AMDR array is required and what impacts are made to NSFS and ASW missions is recommended.



Modified from: GAO (analysis); Navy (image and data). | GAO-16-613