

EXECUTIVE SUMMARY

The US Navy is currently engaged in several low-level conflicts around the globe. These missions include anti-piracy, counter-narco terrorism, ocean platform defense, humanitarian assistance, and maritime dominance. Although they are minor compared to national conflicts, they are vital to maintaining the sea lanes of communication and restricting the flow of money to violent non-state actors. The vessels tasked with this duty, the FFG 7, the DDG 51 and occasionally the CG 47, while adequate, are not ideal for countering the threat. The presence of a dedicated Maritime Interdiction Combatant (MIC) would supplement the fleet's aging FFG 7 fleet and the two classes of Aegis ships that are in high demand for Theater Ballistic Missile Defense and other large, regional threats. The MIC provides an extended endurance platform well suited for conducting persistent surface surveillance and swift maritime interdiction.

The purpose of this project was to develop a modified-repeat of the Arleigh Burke Guided Missile Destroyer (DDG 51) Flight IIA, reconfiguring the vessel as a Maritime Interdiction Combatant. The overarching goals were to reduce acquisition and life-cycle costs and enhance the vessel's organic maritime interdiction and surveillance capabilities while maintaining an adequate level of the Flight IIA's air defense and anti-submarine warfare capabilities. This was accomplished through the replacement of the SPY-1D(V) radar and SQS-53C SONAR with similar, though less capable systems currently employed by the US and NATO Navies. The MIC hosts larger, more capable rigid hull inflatable boats, automated small arms, fully integrated vertical takeoff and landing unmanned autonomous vehicles. Internally, the vessel has increased medical, berthing and stores facilities to accommodate aviation detachments, boarding teams, medical personnel and potential detainees. An alteration of the current DDG 51 IIA engineering plant to a more efficient configuration increased endurance, vital for long loitering times in the Area of Responsibility. The study revolved around current DDG 51 IIA data, arrangements, structure, weights, and drawings. In the Analysis of Alternatives, the merits of several variants were compared and a final design concept was selected. Modifications to the parent DDG 51 IIA vessel were made as necessary to develop the MIC concept into a final design. To ensure the feasibility of the new vessel, structural, stability, and seakeeping analyses were carried out with the help of several software packages.

The results of this study show that the DDG 51 IIA is well suited for a modified-repeat to the Maritime Interdiction Combatant and presents an estimated acquisition cost savings of \$0.3 billion and an estimated life cycle cost savings of \$0.8 billion. The results show that the highly capable MIC would perform well against such low level threats as pirates and drug traffickers while still maintaining a moderate level of the DDG 51 IIA's air defense and anti-submarine capabilities.