Improving PC-1 Class Efficiency and Seakeeping Using Bow Lifting Body Technology

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Abstract

Patrol Coastal (PC-1) class ships operate as forward deployed units out of Manama, Bahrain providing Theatre Security Cooperation, Maritime Interdiction Operations, and Intelligence, Surveillance, and Reconnaissance capabilities to Combatant Commanders in the very shallow water littorals. These small ships, only 180 feet long, displacing 390 tons, and with a complement of 39 officers and enlisted, have relatively limited endurance and a restrictive operational envelope and would better fulfill their missions with improved fuel efficiency and seakeeping. This presentation demonstrates, through a feasibility design study employing advanced computational methods and optimization techniques, that Navatek’s patented Bow Lifting Body (BLB®) technology applied to PC-1 class ships results in vessels that are more fuel-efficient and that have significantly better seakeeping characteristics. This increase in efficiency and reduction in seaway motions will lead to higher top speeds, a larger mission envelope, lower fuel usage, and lower overall emissions. The planned PC Service Life Extension Program could provide an opportunity to backfit BLB technology to achieve these benefits. The results are a proven reduction in fuel for speeds greater than 15 knots, increase in range, reduction in emissions, improved seakeeping over the entire speed range, and increased top speed.

PC-1 Class Ship

Figure 1: PC-1 and BLB65