Littoral Combat Ship and Coastal Patrol Craft

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For the past several years, the US Navy has been discussing the Littoral Combat Ship or LCS. The Littoral Combat Ship (LCS) is intended to assure sea based access for joint operations by satisfying capability gaps in littoral Mine Countermeasures (MCM), littoral Surface Warfare (SUW) and littoral Anti-Submarine Warfare (ASW), while the in-service Fleet of multi-mission surface combatants continues to dominate in deep water and power projection operations. In addition to these three separate missions, the core capabilities of the ship will be mobility; special operations force; intelligence, surveillance, reconnaissance; maritime interdiction operations; homeland defense; and anti-terrorism force protection. The importance of the LCS to today's Navy cannot be overstated, as it is the center piece of our "313 Ship Navy" that we hope to get to. However, the LCS has been plagued with construction problems and cost over-runs. With the cost of the Navy's current littoral combat ship skyrocketing and its funding in peril of repercussions from Congress, some say the sea service ought to give serious consideration to acquiring cheaper boats that could complement a reduced fleet of larger surface combatants. As a result of the need to fill the Navy's capability gap in non-traditional roles, especially required in the littoral regions, it is the intent of this project to do a complete, from the ground up, design of a Littoral Combat Ship that will be cheaper than the current LCS, as well as design a smaller patrol type vessel based off the baseline LCS that is developed.

This study employed a very unique design methodology. The new LCS was designed around the current LCS Initial Capabilities Document (ICD) with a few modifications. It followed a very traditional design methodology. However, the Coastal Patrol Craft (CPC) was designed without an ICD. It utilized certain modules (main machinery module, auxiliary machinery module, etc.) from the LCS. The hypothesis was that this could lead to significant benefits in engineering, production, and maintenance costs. The downside is that the second ship is somewhat fixed based on the optimization of the LCS. The principle characteristics of each ship are shown in the table below.

The costs associated with this project were calculated in two separate ways. The first way was to use the MIT Cost Model for each ship independently, as if each ship was to be a separate class by itself. The second way was to modify the MIT Cost Model in a manner that would capture the unique design methodology that was employed in for this project. These two different costs were then compared so that the actual savings could be determined. The analysis performed shows that there will exist a 10% procurement cost savings for LCS and that the CPC will cost approximately 15% less than if its design had not leveraged the LCS design. It is envisioned that there will also be savings associated with the lifecycle costs. By having two ship classes that have common types of mechanical equipment, there is likely huge savings in the supply chain, training arena, and shore support. These areas are not easily quantified in our cost model, but they nevertheless will provide a net savings in terms of the lifecycle costs of these two classes of ship.

	Littoral Combat Ship	Coastal Patrol Craft
Displacement	2776 LT	1162 LT
Arrangeable Area	34334 ft^2	16998 ft^2
LBP	350 ft	225 ft
Beam	41 ft	34 ft
Draft	12.3 ft	10 ft