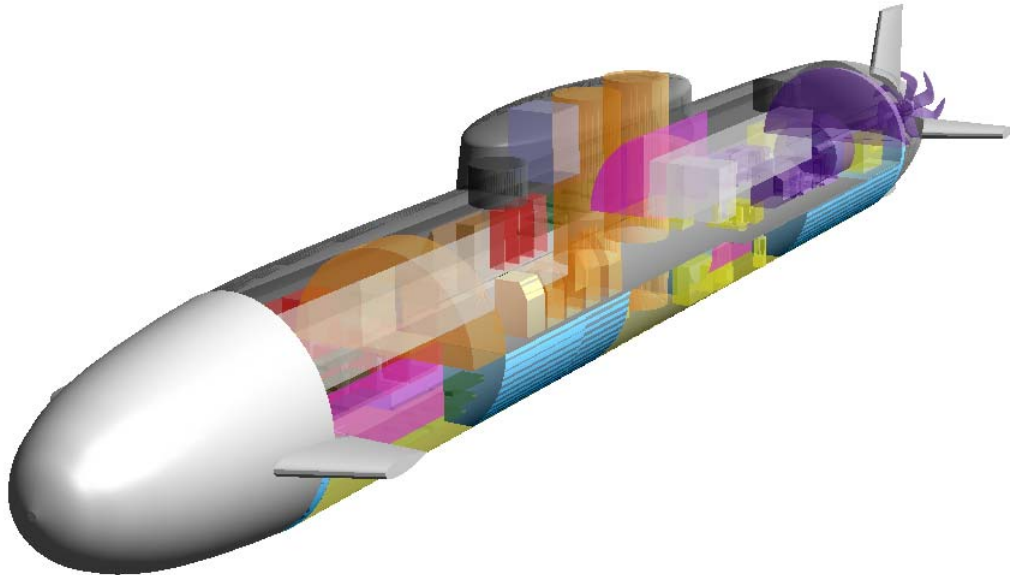


Conventional Littoral Strike Submarine

Through Paramarine™ -aided Design

**LTJG Kyriakos Avgouleas, HN, LCDR(s) Richard Jones, USN,
LCDR Ethan Proper, USN**



Future submarine operations will require a submarine with strike capability beyond that of the submarines in the current inventory. The Littoral Strike Submarine (SSL) will fill the gap between the Virginia class submarines, which are limited in the strike role to carrying Tomahawk cruise missiles and the deep draft SSGNs. The SSL will operate primarily in littoral waters providing rapid strike capabilities to forces on shore. The SSL will also provide NATO allies with strike capabilities as well as enhanced covert troop delivery.

Design Goals and Thresholds

Design Parameter	Threshold	Goal
Operating Depth	200m	300m
Speed	12 kts	21 kts
Range (@ 10 kts)	3000 nm	5000 nm
Endurance	10 days	14 days
Crew (Off/Enl)	6 / 24	6 / 31

The top level architecture was determined by a Pugh analysis. The key parameters for the SSL were large diameter, vertical payload tubes located centrally in the submarine, and a body of revolution hull form with parallel mid-body. Paramarine™ was chosen as the design tool for this project and was used to perform the design and analysis of the submarine.

Final Design Summary

Design Parameter	Final Value
LOA	57.4 m (188.2 ft)
Beam	6.72 m (22 ft)
Submerged Displacement	1894 LT
Surface Displacement	1684 LT
Max. Submerged Speed	22.1 knots
Operating Depth	200m
Crew Size	6 officers / 25 enlisted
Endurance	12 days without snorkeling
Cost	\$471.7 Million

The SSL incorporates design features which are unconventional in traditional designs. The first of these is a removable composite sail which allows the sail to be removed during extended maintenance availabilities, greatly improving access to equipment in the sail and for preservation of the area within the sail. Another was the high level of automation incorporated in the operating systems to allow a reduction in the crew size while enhancing mission capability. Lastly, large diameter payload tubes are included in a non-nuclear submarine allowing a wide variety of payloads to be carried.

The analysis conducted on the SSL indicates that the SSL will meet all design thresholds and satisfies the requirements of the Initial Capabilities Document.