

EXECUTIVE SUMMARY

The final LOS ANGELES Class Fast Attack submarine will be decommissioned in fiscal year (FY) 2030, and the US Fast Attack Submarine Fleet will consist entirely of VIRGINIA Class Submarines. The OHIO Class SSGN's will have been decommissioned over the previous five fiscal years by current plans; and given current attitudes about those ships and their utility, the perceived and real loss of capability to the fleet will be significant. Initially projected as a class of 30 submarines, the VIRGINIA will have been in production for just over 30 years, and by 2032 (FY), the last of the final block of originally projected VIRGINIA's will have been delivered. Without a change in the number of VIRGINIA's built, design and construction of a replacement class of submarines for the VIRGINIA should begin around FY 2018 to allow adequate time for design and a smooth transition from construction of VIRGINIA to the replacement class.

The SLISR concept design process explored innovative ideas as well as current techniques including external weapons, sail-less design, IPS systems, modular construction, and double-hull design. A modified version of the MIT submarine MATHCAD model was developed to accommodate a non-body-of-revolution submarine concept in this clean sheet design project. This MATHCAD model was used in conjunction with Rhinoceros 3D to develop the necessary balanced volumes and weights in an iterative fashion. Additionally, the model was imported into Paramarine to conduct seakeeping and stability analyses. Finally, a simplified cost model was used within MATHCAD to estimate the acquisition cost of the SLISR submarine.

The study produced a highly capable and innovative submarine that is stable, meets all customer design requirements, and is cost effective as a replacement to the VIRGINIA Class Submarine.