Conventional Submarine Converted to Carry Unmanned Undersea Vehicles (SSKU)

by

LCdr J. Ben Thomson, RCN
LT Matthew E. DiVittore, USN
LT Benjamin W. Parker, USN

Massachusetts Institute of Technology
Department of Mechanical Engineering

ABSTRACT
Given recent improvements in submarine technology, such as air-independent propulsion , improved energy storage technologies, and Unmanned Undersea Vehicle (UUV) capabilities, it is worth considering augmenting the current fleet of nuclear-powered submarines with modified conventional attack submarines (SSK) which can act as specialty ships for intelligence, surveillance, and reconnaissance, covert deploying and retrieval of UUVs, and special operations forces support.

This study shows that modifying a modern European-built SSK to incorporate UUV deployment and recovery is feasible and provides considerable advantages. Additionally, that the modifications can be achieved with little change to trim and overall stability of the submarine. These findings are expected to apply to other SSKs as long as the weight ratio of torpedoes displaced to Large UUVs (LUUV) embarked is equivalent. We have shown the feasibility through the modification of a VICTORIA Class submarine currently in use by the Royal Canadian Navy (RCN). The VICTORIA Class was selected as it has already been adapted for USN weapons and sensors, and technical data is readily available. It must be understood that this project is meant to show the feasibility, through engineering analysis, of converting a modern European-built submarine such as the platforms considered for the recent COLLINS Class Replacement Project and to be implemented as a design change prior to construction. Implementation specifically on the VICTORIA Class was used only to validate the design.

Project Supervisor: CAPT Joe Harbour

Title: Professor of Naval Architecture and Marine Engineering