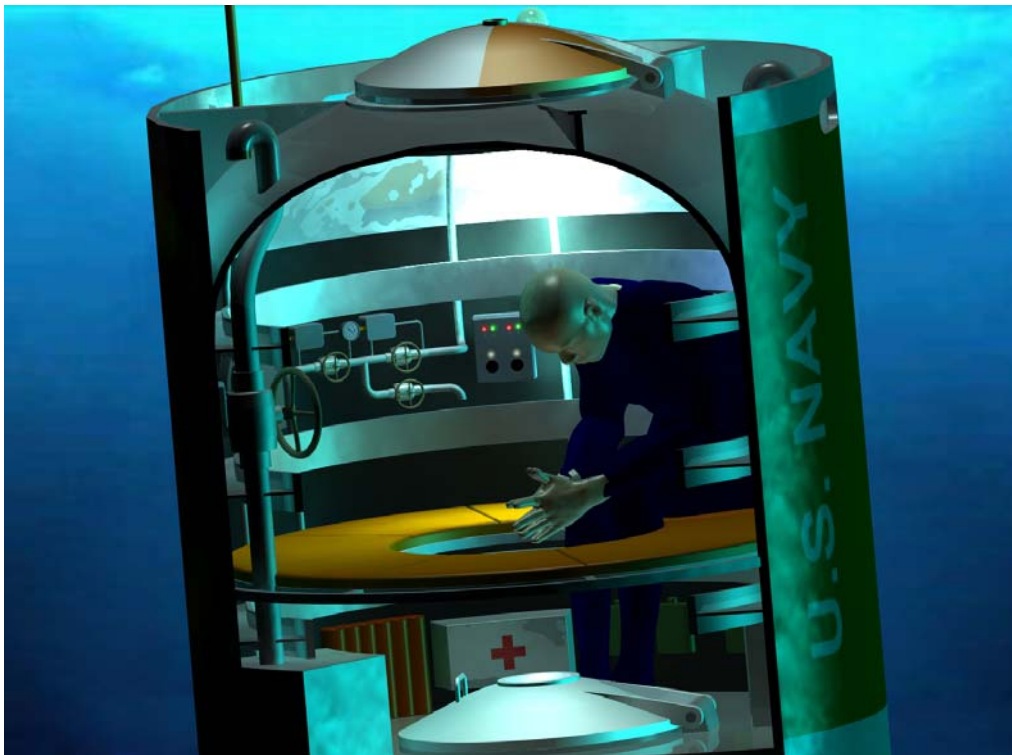


Surfacing Rescue Container Concept Design for Trident Submarines

LCDR Joshua Jonathan LaPenna, USN

Prof Tomasz Wierzbicki
Thesis Supervisor

In the wake of the KURSK tragedy, world navies have brought their full attention to the submarine rescue problem. While many rescue systems exist, none have been able to sufficiently address the gamut of scenarios that place submariners in peril. One rescue strategy utilizes a submarine escape capsule commonly referred to a Surfacing Rescue Container (SRC). Although SRCs have been employed in several submarine designs over the last four decades, the United States has never adopted the underlying strategy. This paper recognizes the SRC concept as the most reliable means of rescue, and proposes a modular SRC concept design (LSRC) which utilizes a modified Trident D-5 missile tube as its host. The design is intended for use on the U.S. Navy's next generation ballistic missile submarine (SSBN) but may be back-fitted on current U.S. Navy Ohio class and U.K. Royal Navy Vanguard Class submarines with significant alteration. Technical analyses include a minimum weight design approach for internally stiffened right circular cylinders exposed to external hydrostatic pressure, an analytical and numerical structural analysis of imperfect ring stiffened cylinders, and a seakeeping analysis for cylindrical spar buoys.



Naval Engineer and Master of Science in Mechanical Engineering