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Wayne E. Meyer Institute of Systems Engineering

Meyer Institute Logbook

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2003-11

# The Logbook, A Publication of the Wayne E. Meyer Institute of Systems Engineering / November 2003

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Wayne E. Meyer Institute of Systems Engineering



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# THE LOGBOOK

A Publication of the  
**Wayne E. Meyer Institute of Systems Engineering**  
[www.nps.navy.mil/meyerinstitute](http://www.nps.navy.mil/meyerinstitute)

Volume 4  
November 1, 2003

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## SEA BASED FORCE PROTECTION



In early 2002, NPS students participating in the Meyer Institute's

integrated project were tasked by the Deputy CNO for Warfare Requirements and Programs (OPNAV N7) to conduct an Expeditionary Warfare study. These students completed the first year of this two-year project. They used a "system of systems" approach to design an architecture with an overarching set of system requirements to conduct expeditionary operations in littoral regions, explore interfaces and system interactions, and compare current, proposed, and conceptual sea-based platforms against these requirements.

Based on input from OPNAV and advisor recommendations, the second year of the project is focused on Force Protection of the Sea Base. This year's team includes students in the Systems Engineering and Analysis (SEA) program, the Total Ship Systems Engineering (TSSE) program, the Physics Department, the Operations Research Department, the C4I curriculum, and others. The team will continue with the Sea Base project by using a "system of systems" approach to develop an architecture to provide force protection for the conceptual Sea Base conducting expeditionary operations in littoral regions. Force Protection is defined actions taken to prevent or mitigate hostile action against the Sea Base to include resources, facilities, and critical information. These actions conserve the force's fighting potential so it can be applied at a decisive time and place and incorporate the coordinated and synchronized offensive and defensive measures to enable the effective

employment of joint forces while degrading opportunities for the enemy. Force protection does not include actions to defeat the enemy or protect against accidents, weather, or disease.

Why Force Protection? The Navy and Marine Corps have been conducting expeditionary operations since their inception. Few of these operations have been unopposed. Future adversaries will probe perceived weaknesses and work to deny U.S. forces access to their regions by various means. They will do this using conventional and asymmetric strategies to conduct attacks on the Sea Base, landing craft, and aircraft components of our expeditionary warfare force. The NPS team has recently completed an assessment of the various threats to the Sea Base as the last step in defining the problem. This assessment was briefed to the MI faculty overseeing this year's project and approved as the basis from which to move forward in the design of a conceptual "system of systems" to provide Force Protection for the Sea Base. Current work includes Joint Campaign Analysis studies, Modeling and Simulation efforts, and continued research of sensor and weapon capabilities needed. Graduation is approaching in December, and the team is working hard to complete a meaningful, comprehensive study that will help provide the Navy with innovative ideas needed to adequately protect our forces in the future.

The NPS students will present a project brief at NPS on 4 December from 0830-1530. The Meyer Institute welcomes those who wish to attend. Please contact MeyerInst@nps.navy.mil for additional information.



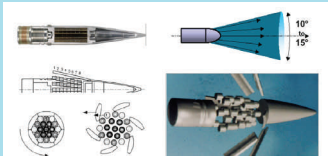
Take a look at the new Meyer Institute web site!

[www.nps.navy.mil/meyerinstitute](http://www.nps.navy.mil/meyerinstitute)

## MSSE Capstone Projects

The Master of Science in Systems Engineering (MSSE) program is designed to help Department of Defense engineering organizations become more responsive to the changing nature of engineering tasking in support of research, development, and acquisition. Meyer Institute distance learning students enrolled in the MSSE program participate in a capstone design project.

The purpose of the Capstone Project is to integrate the course material within the framework of a three-quarter project that is relevant to the students and their sponsoring organization. For example, June 2003 graduates from NSWC-Port Hueneme developed concepts for an AAW self defense system for the Littoral Combat Ship (LCS). In the first quarter of the project, the class was divided into five teams. Each team developed a high level concept for the system. During the following two quarters, the class merged into an integrated product team structure under the leadership of a student technical director. The merged team performed an analysis of alternatives on the five concepts and developed a final design concept using new DoD acquisition guidelines. At the end of each quarter, the students went through design reviews with both faculty and their sponsoring management. The final review was presented at both NSWC-Port Hueneme and NPS, to both faculty and students in other programs. Fall 2003 saw the beginning of the second MSSE capstone project. Students initially worked with NPS resident students on the LCS in the Force Protection role. They will soon divide into concept teams and will present results on 15 December in Port Hueneme. In the follow-on quarters, they will continue the pattern and present a final design concept in June 2004. Please contact [wowen@nps.navy.mil](mailto:wowen@nps.navy.mil) for more information.



Pre-fragmented Air Burst Munitions Diagram from MSSE Cohort 1 Project

Upcoming Logbook Issues: Temasek Student Theses Integration with MI Integrated Study, MI Integrated Project 2004, Northrop Grumman Industry Chair Highlights, MPA Search Techniques Against Diesels