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Wayne E. Meyer Institute of Systems Engineering

Meyer Institute Logbook (Newsletter), 2003-2009

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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)

February 1, 2004  
Volume 7

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## DISTANCE LEARNING NEWS

Dr. Benjamin Roberts  
Director of Distributed Learning Programs

### Joint Executive Systems Engineering Management (SEM) degree program offered in partnership with MIT's "Educational Consortium for Product Development Leadership in the 21<sup>st</sup> Century" (PD21)

The SEM-PD21 program office is currently planning a spring industry trip for all students. Options include a trip to the Northeast with a visit to MIT and sessions with their faculty and students or a trip to Monterey-San Jose, California, with Rochester Institute of Technology students joining NPS students for the visits. Either way, the interaction between NPS and other PD21 consortium school students should be an added bonus to the overall experience. For more information about this joint executive program, visit the SEM-PD21 website at <http://ocl.nps.navy.mil/pd21>.

### Technical Systems Engineering (MSSE) Degree Program

On January 26, a Systems Engineering Integration certificate ceremony is being conducted at NSWC- Port Hueneme. The Systems Engineering Integration certificate is earned by students who successfully complete the first full six quarters of the eight quarter degree program.

This summer a new MSSE program will start, and it will be open to all organizations who can sponsor a minimum of five students. Students take two courses per quarter for a two-year period. A general announcement for this new start program will be sent out and posted to the website in early February. For more information, visit the MSSE website at <http://ocl.nps.navy.mil/msse>.

### A Distance Learning Note

A recent study of distance learning found that only 8 percent of undergraduate and 10 percent of graduate students in institutions of higher education have been exposed to distance learning methods. As a rapidly growing means of education, there is a growing body of knowledge describing success factors. For instance, in the case of asynchronous online learning, a recent report has identified three factors that significantly contribute to the success of online courses: consistency in course design; interaction with course instructors; and active discussion.

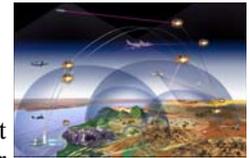
The authors suggest that the reason for these findings relates to the importance of building community in on-line courses. We are aware of factors such as these, and strive to incorporate lessons learned into our distance education programs. There are many excellent on-line learning sources potential and current distance students can use to help understand and take advantage of the distance learning process. For more details, please contact the Director of DL Programs at [broberts@nps.navy.mil](mailto:broberts@nps.navy.mil).

For more information:

SEM-PD21: <http://ocl.nps.navy.mil/pd21>

MSSE: <http://ocl.nps.navy.mil/msse>

## Maritime Dominance



Late in 2003, NPS students at the Meyer Institute (MI) for Systems Engineering began to focus on the evolving challenge of maritime regional threats. NPS students were tasked by the Deputy CNO for Warfare Requirements (OPNAV N7) to develop a System of Systems (SoS) concept to enable maritime dominance in the littorals. This tasking addresses key operational concerns for the Navy while affording the opportunity for students to further develop precedents identified during the NPS AY2002 Integrated Project Expeditionary Warfare (EW) study. The current AY2004 integrated project is a fresh look at the difficulties compromising complicated operations involving maritime power projection into the littoral realm, a region of conflict highlighted by asymmetrical threats.

Systems Engineering and Analysis Class 5 (SEA5) will lead the performance of the Project Concepts Exploration, heading an integrated project team with students from the TEMASEK Defense Systems Institute (TDSI) studying in the Communications, Information Assurance, Land Systems, Operations Research, and Physics Departments. The SoS conceptual solutions will include surface, subsurface, and air systems available from all armed services, focusing on unmanned systems requiring integrated concept exploration, and addressing current, proposed, and conceptual architectures. Conceptual solutions will be achieved by collaborating with individuals and teams inside and outside of the NPS community and must address potential Concepts of Operations (CONOPS) dealing with Assured Access within the 2020 timeframe. SEA5 assumes that current programs of record will mature concurrently with the force structure.

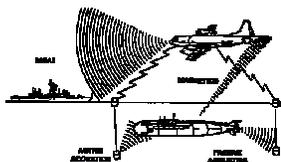
The SEA5 project team will present and deliver a final paper detailing the SoS conceptual solutions to the problem of providing maritime dominance in the littoral environment in June. The presentation and paper will outline all stages of the project focusing on the technical analysis and configuration of the conceptual solutions. Other deliverables will include progress reports as required by the project advisors and a requirements letter for supporting technical teams. In June 2004 the SEA5 project team will deliver a technical report. This report will summarize all project work. It will outline all stages of the project focusing on the technical analysis and configuration of the developed conceptual solutions.



Diesel Submarine



P-3



ASW Illustration

## Diesel Submarines Still a Threat

Commander Patrol Reconnaissance Force Pacific (CPRFP) has enlisted NPS' assistance to research tactics in an area of continuing importance for the Navy – that is, non-acoustic detection of diesel submarines by Maritime Patrol Aircraft (MPA). In a collaborative effort led by the Operations Research and Systems Engineering Departments and coordinated through the Meyer Institute, lead investigators Dr. Jeff Crowson (OR) and Matt Boensel (SE) will provide supporting data for the effectiveness of random radar diesel submarine search tactics as currently employed (as defined in NTTP 3-22.5-P3 NAVAIR 01-75PAA-1T (P3 Tactical Manual)). Further, working with Fleet analysts and interested NPS faculty and students, the study will develop a parametric sensitivity analysis to help the MPA community better understand predicted probabilities of detection given various targets and environmental conditions. While radar techniques are a specified focus of the research, it is anticipated that visual, Infrared (IR), and electronic emission intercept will be significant sensor technologies as well. The study will be conducted throughout 2004 and has as its goal a Tactical Memorandum (TACMEMO) for Fleet use.

Dr. Crowson recently returned from San Diego where he served as the NPS Research representative to the Commander Third Fleet. As part of his Third Fleet duties, he was able to locate and review a significant number of tactical publications and documents pertaining to the non-acoustic detection of diesel submarines. While visiting commands throughout the San Diego area, he was able to interview numerous ASW subject matter experts (SME). The background information provided by these SMEs has thus far proven invaluable in attempting to determine the current level of performance with diesel submarine ASW tactics in the fleet.

### A Word From the Northrop Grumman Ship System (NGSS) Chair....

When I was consulted regarding the establishment of an NGSS Chair at NPS, my initial reaction was very positive. The basic purpose of the Chair is to bring an industrial perspective to the systems engineering curriculum at NPS and the Wayne E. Meyer Institute.

My work experience has as its foundation the application of systems engineering to ship design. The LHA Tarawa Class and DD963 Spruance Class were bid and designed in the 1960s using systems engineering tenets and were the first major combatants designed by industry based on operational requirements developed by the Navy. Both of these ship classes were technically successful, introducing innovations such as gas turbine propulsion, and each Class has derivatives including the current LHD and the CG47 Ticonderoga Class, and I was proud to be involved in their design.

Although some of the semantics have changed, the fundamental principles of the systems engineering approach used to define and design complex military systems remain the same as those initially developed during the 50s and 60s. This industrial experience which spans over 40 years of aerospace design as well as ship design and construction is what I hope to bring to my work at NPS.

These first six months at NPS have been very exciting and challenging. Along with Professor Chuck Calvano, I am implementing the terms of the Cooperative Research and

Development Agreement (CRADA) signed between NGSS and NPS. In November the Total Ship Systems Engineering (TSSE) Class was able to visit NGSS New Orleans Operations. The students attended presentations on current R&D projects as well as the state of the art 3D Ship Modeling and Design System used to design and build the LPD 13 Class Amphibious Assault Ship. They in turn gave a presentation on their TSSE project. The discussion included comparisons to current LCS designs.

In addition to providing systems engineering advice to individual students and class teams, I am responsible for SI 4000, Systems Engineering Seminars. On a weekly basis this class brings invited speakers from industry, government, and academia to discuss all the varied aspects of Systems Engineering. The seminars ranging from one titled "Ethics in the Middle" to "Systems Engineering on the DDX Class Design" invoke student discussion and provide insight to current industrial applications of systems engineering.

I believe industrial participation rounds out the student experience and provides a perspective not normally found in academia. I look forward to the next few years and hope to provide an adequate foundation for those who follow.

Bill Solitario, Visiting Professor  
Northrop Grumman Ship  
System Chair

