

NAVAL SCIENCE AND TECHNOLOGY

ENGR 3109: Navy STEM Professional Development Seminar

UConn / URI STEM Program Fall Seminar Series

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5:00 pm to 6:00 pm

PRESENTER:

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TITLE OF PRESENTATION: Evolution of Submarine Design and Construction at Electric Boat in the Nuclear Submarine Era

ABSTRACT: The history of nuclear submarine design and construction at Electric Boat is summarized beginning with the USS Nautilus (SSN 571) authorization in 1952, through three generations of submarine development to the present that includes the Navy's latest submarine class, the Columbia SSBN, which will start construction in the Fall of 2020. The construction of each submarine is a daunting challenge. A Virginia Class SSN requires over 2,700 tons of structural steel, 31 miles of pipe, 142 miles of cable, 20,000 major components and more than 300,000 welds. This brief will include a discussion of the role of engineering from three perspectives: the operator, the ship design agent and lastly the shipbuilder. It will provide a perspective of how naval science and technology have supported the Navy's vision of undersea dominance through the continuous improvement of each class of submarine. The most recent submarine program, the Virginia Class Submarine Program began construction in 1998 and has been frequently heralded by the US Navy as a model DOD acquisition program. Noted for its on-time deliveries and for its construction span reduction from 84 to 66 months the first 17 ships of the Class have been delivered with 11 more in the construction backlog. Electric Boat is the prime contractor for and works closely with Newport News Shipbuilding in a unique co-production arrangement on the construction and deliveries of these submarines. Electric Boat has been a pioneer in developing innovative nuclear submarine designs and their associated construction processes. The benefits of modular design and construction advancement are reviewed which includes shorter cycle times, resource optimization, improved learning and risk reduction. Modular construction allows for efficient parallel construction that reduces touch labor and support costs, increases scheduling efficiencies, reduce change cost and reduce rework.

BIOGRAPHY: Tom is the Director of Strategic Planning at Electric Boat Corporation in Groton, CT. He is responsible for the development of the company's annual strategic plan and maintaining a comprehensive analysis of the business environment, focusing on the Navy, the Department of Defense

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and the defense industrial base. Plante, 59, graduated from Rensselaer Polytechnic Institute in Troy New York in 1980 and holds a Bachelor of Science degree in Mechanical Engineering. He served in the US Navy as a junior officer aboard USS Boston (SSN703) from 1981-1984 where his duties included Electrical Officer, Reactor Controls Assistant, Sonar Officer and Weapons Officer. He joined Electric Boat in September 1984 and has served in a variety of positions with increasing responsibility including: Systems Engineer for the TRIDENT Training Facilities in Bangor WA and Kings Bay GA; Project Manager for new business initiatives; and Principal Engineer for the VIRGINIA Class Submarine Program. Tom received a Master's of Science degree in Computer Science from Rensselaer Polytechnic Institute, Hartford Graduate Center in 1990. In 2001 he was promoted to Program Manager for Virginia Class Technology Insertion where he led the development of a number of technology insertion initiatives that included the Advanced Sail, Large Aperture Bow Sonar Array, Conformal Arrays and the Multi Mission Module design. More recently, Tom is responsible for developing an Integrated Enterprise Plan (IEP) which is a 20-year master plan to build 41 additional submarines starting in 2019 which will include 29 Virginia Class Submarines with a major upgrade known as the Virginia Payload Modules and 12 Columbia Class Ballistic Missile submarines.