



OFFICE OF THE DEPUTY ASSISTANT SECRETARY OF DEFENSE SYSTEMS ENGINEERING

System of Systems Engineering Collaborators Information Exchange (SoSECIE)

September 1, 2015
11:00 a.m. to Noon Eastern Time

Approach to Capability-Based System-of-Systems Framework in Support of Naval Ship Design

*Dr. Santiago Balestrini-Robinson and Dr. Simon Briceño, Georgia Institute of Technology
Cdr Jacques P. Olivier, Department of National Defence, Canada*

Abstract

This presentation will cover a paper previously presented at the 8th annual IEEE International Systems Conference held in Ottawa, ON, Canada, on 2nd April 2014. This paper represented the latest instantiation of a series of evolving work attempting to improve the methods and techniques used for designing and supporting the acquisition of complex military systems, with an immediate application to naval surface combatants. Ship design provides an ideal proof-of-concept as it is a large and potentially complex endeavor to test the methodology presented.

The postulation is that modern naval ship design should consider the systems of interest as components subsumed by a holistic environment encompassing assets and capabilities inorganic to a naval platform. This position paper propose a starting point approach intended to provide a more defined means of establishing and improving the ship design process as part of a multi-layered maritime domain warfare enterprise. The paper will first explore the applications of SoS theories in the naval context and offer foundational definitions to better explain what is meant by capability-based framework.

The proposed methodology provides a structured and cohesive approach for identifying and assessing ship capability portfolio with traceable and better known impacts on mission effectiveness, affordability and risk, in the early stages of ship design within the scope of a naval system-of-systems.

Disclaimer: This paper is an unclassified position paper containing public domain facts and opinions, which the authors alone considered appropriate and correct for the subject. It does not necessarily reflect the policy or the opinion of any agency, including the Government of Canada, the Canadian Department of National Defence, or the Georgia Institute of Technology.

Biographies

Dr Santiago Balestrini-Robinson is a Senior Research Engineer at the Georgia Tech Research Institute, part of the Georgia Institute of Technology. Dr Balestrini-Robinson specializes in analysis of complex defense systems, particularly military effectiveness modeling and simulation, and human decision support methods and techniques. He is currently supporting the development of collaborative model-based systems engineering tools to support the DoD acquisition process.

Dr Simon Briceño is the Chief of the Advanced Concepts Division at the Aerospace Systems Design Laboratory of the Georgia Institute of Technology. He oversees ASDL's research in rotary and fixed wing systems design, advanced manufacturing methods, unmanned air-systems and robotics, and safety and certification. His research is focused on developing methods and tools for complex systems for virtual prototyping and verification. He received a B.S. in Mechanical Engineering from Syracuse University and a M.S. and PhD in Aerospace Engineering from Georgia Tech.



OFFICE OF THE DEPUTY ASSISTANT SECRETARY OF DEFENSE SYSTEMS ENGINEERING

Cdr Jacques P Olivier is a serving Royal Canadian Navy officer with over twenty years of experience in naval systems engineering and integration. A graduate from the Royal Military College of Canada, Cdr Olivier holds several international post-graduate degrees including an MSc in Naval Architecture and Marine Engineering from the Massachusetts Institute of Technology. As a Section Head in the Maritime Equipment Program Management division of the RCN, he supports the compliance to the materiel acquisition and support policies and guidelines for the life cycle support of all naval platforms, systems and equipment.