Editorial

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Biographical notes: Thomas P. Conrad is the Enterprise Manager for Innovative Research at Rite Solutions, and the Chief Engineer on a project to define the 'Combat System of the Future' for the US Submarine Force. Prior to that, he held increasingly significant roles in a 44-year career at the US Naval Undersea Warfare Center in Newport, Rhode Island, culminating in positions as the manager of the Architecture and Information Technology Division and as Director of the Center for Advanced System Technology. He has been a frequent conference speaker on various software and system engineering topics, notably open architecture and interoperability. He has led numerous technology and risk assessments of major defence system acquisition programs for the Departments of the Navy and Defense. He has an MSE and Certificate in Advanced Graduate Studies in Computer and Information Sciences from the University of Pennsylvania's Moore School of Electrical Engineering.

Adrian Gheorghe has held the Batten Endowed Chair of Systems Engineering at Old Dominion University since 2006. Prior to this, he was involved in educational activities as a Professor of Industrial/Energy Policy and Organisational Management, Bucharest Polytechnic University, Romania, Department of Physics, University of Bucharest, and Professor for Industrial Risks and Decision Analysis, Faculty of Chemical Engineering, University Politehnica Bucharest, Romania. He was a Civil Servant (1990 to 1993) with the International Atomic Energy Agency, Vienna, Austria working in the field of comparative risk assessment of various energy systems, and regional risk assessment of nuclear and industrial systems. During 1993 to 2006, he was the Director with the Centre of Excellence on Risk and Safety Sciences, and a Senior Scientist, with the Swiss Federal Institute of Technology, Zurich, Switzerland and Visiting Professor of Operations Research and Decision Analysis. He received his PhD in Systems Science/Systems Engineering, from City University, London

This special issue focuses on a methodology for system of systems engineering (SoSE) and its application to a specific system of systems (SoS) problem being faced by the US Navy. The Navy SoS problem is radio frequency information exchange in an aircraft carrier strike group, a principal power projection and peacekeeping instrument for the USA and her allies. The SoSE methodology presented in this issue is one developed at the National Centers for System of Systems Engineering (NCSOSE), a research centre in the Batten College of Engineering and Technology at Old Dominion University in Norfolk, Virginia, USA.

As the special editors for this issue of the journal, we are pleased to present these papers for your review. The papers represent one view of SoS engineering. This school of thought is being developed in the USA by NCSOSE. The SoSE methodology is the first instantiation of a group of methods and techniques for approaching a SoSE problem holistically. The application of multiple perspectives and grounding in systems principles provides a systemic framework for approaching complex SoS problems in the real-world. The application of the SoSE methodology to the Navy radio frequency information exchange problem being faced by the carrier strike group (SoS) is, to our knowledge, the first large-scale, formal SoSE analyses conducted using a holistic and systemic approach.

The articles in this special issue have been purposefully assembled. The articles present a series of topics arranged in a linear fashion, each one preparing the reader for the following article.

The first article by Adams and Meyers introduces the reader to a US Navy carrier strike group and defines it as a SoS. The second article by Tribble and Adams proposes using a SoSE approach as an aid in improving the conduct of readiness evaluations for carrier strike groups.

The third article by Adams and Keating provides an overview of the SoSE methodology and its use in conducting a SoSE analysis. The fourth article by Adams exposes the reader to the systems principles that provide the foundation for the SoSE methodology. The fifth article, by Shauger, focuses on how the foundation systems principles were used during the SoSE analysis of the radio frequency information exchange problem being faced by US Navy carrier strike groups.

The sixth article, by Adams and Meyers present the methodological elements of the SoSE Methodology involved in developing an initial framing for a SoSE analysis. This is followed by a paper by Walters that focuses on how the framing perspective was applied during the SoSE analysis of the radio frequency information exchange problem. The eighth paper, by Keating presents the methodological elements of the SoSE methodology that designs the unique methodology to be used in a SoSE analysis. The ninth paper, by Walters and Shauger summarises the lessons learned while using the SoSE methodology during the SoSE analysis of the carrier strike group.

The final paper, by Keating and Katina is a summary of the SoSE field and presents the prospects and challenges being faced by the emerging field.