System of Systems Engineering Collaborators Information Exchange (SoSECIE)

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Mission Threads: Linking Mission and Systems Engineering

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Abstract

As program managers and engineers, the task is to both "build it right "and "build the right thing." Mission engineering enables "build the right thing" by providing an approach to understanding the mission(s) associated with a system of interest (SOI), the capabilities the SOI must provide in support of the assigned mission(s), and how the SOI fits into the system of systems (SoS). Systems engineering enables "build it right" by providing a framework for the specification, realization, and test of the SOI. Integration of both efforts into a seamless flow will better ensure that the system created will meet the warfighter's needs.

The identification and elaboration of mission threads is a powerful tool in the systems engineer's arsenal, supporting both the mission engineering effort and systems engineering effort and linking them together.

This presentation introduces a multiple-step approach to using mission threads to capture the mission context, trace how a system supports a mission as the SOI matures, and evaluate how operational contingencies affecting a mission have an impact on the SOI.

Biography

Dr. Greg Butler is a systems engineer with Engility. His current interests are systems engineering processes, communications analysis, and embedded systems. His past research included lean manufacturing and the human side of information technology implementations and deployments. Greg has served as a U.S. Air Force officer and DoD civilian, with 18 years of acquisition experience working as a program manager and engineer. He has held roles as an ISSM and ISSE. He is a CISSP-ISSEP and holds a B.S. in Electrical Engineering from the University of Wyoming, an M.S. in Management from Lesley University, and a Ph.D. in Information Systems from Utah State University.

Dr. Carol C. Woody is the technical manager of the CERT Cybersecurity Engineering team in the Software Engineering Institute at Carnegie Mellon University. Her research focuses on building capabilities for measuring, managing, and sustaining cybersecurity for highly complex networked systems and SoS. She is coauthor of the book *Cyber Security Engineering: A Practical Approach for Systems and Software Assurance*, published November 2016 as part of the SEI Series in Software Engineering.

In prior experience, Dr. Woody addressed system and software consulting, strategic planning, and project management successfully implementing technology solutions for such diverse domains as banking, mining, clothing manufacturing, land records management, financial management, human resources management, and social welfare administration. She holds a B.S. in Mathematics from the College of William and Mary, an M.B.A. with distinction from Wake Forest University, and a Ph.D. in Information Systems from NOVA Southeastern University (NSU).