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System of Systems Engineering Collaborators Information Exchange (SoSECIE)

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Mission Engineering for Warfighting Integration of Net-Centric Systems

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Abstract

The individual branches of the US military are becoming increasingly integrated and interdependent upon each other for successful mission completion. The current systems engineering process typically takes mission completion into account during the requirements process. Once the requirements for the specific system have been allocated, unless systems are tightly coupled, most system development is completed without revisiting the mission context. This process can work well when systems do not exchange information or otherwise rely on each other for mission accomplishment; however, when systems become network-centric and interdependent, they must be developed, tested and deployed within the mission context throughout the acquisition life cycle. The US Air Force is developing the Air Force Integrated Collaborative Environment (AF-ICE), a distributed modeling and simulation environment that allows for mission-oriented capabilities analysis of concepts of operations, requirements, solution trades, prototyping, human systems integration, development testing, and operational testing. This presentation will discuss the mission-oriented processes used to plan and conduct AF-ICE events, provide some examples of those events, and discuss some of the challenges associated with the verification, validation, and accreditation of distributed simulation environments that impact data analysis of net-centric systems. Consistent with conference goals, emphasis will be made on defining and using a consistent simulation environment throughout the life cycle to reduce risk, improve traceability to system requirements, and evaluate net-centric systems within the required mission context.

Biography

Eileen A. Bjorkman, a Senior Level executive, is Technical Adviser, Air Force Flight Test Center, Edwards Air Force Base, CA. She provides leadership and final review of the technical aspects of the center's overall program as well as consultant advice and technical guidance to agencies within and outside the center. In collaboration with the center commander, Ms. Bjorkman establishes test and evaluation technical policy and procedures, and provides technical expertise and direction to the AFFTC work force. Ms. Bjorkman chairs the AFFTC Center Systems Engineering Council and is the AFFTC Science and Engineering Center Functional Manager. Ms. Bjorkman served nearly 30 years as an Air Force officer, retiring as a colonel. During her military career she served as a flight test engineer, instructor and test squadron commander. She was a senior non-rated aircrew member and flew more than 700 hours as a flight test engineer in over 25 different aircraft, primarily the F-4, F-16, C-130 and C-141. She also held multiple staff and director positions involving modeling, simulation, analysis and joint testing, retiring from active duty as the Chief of the Modeling and Simulation Policy Division, Warfighter Systems Integration and Deployment. She has a bachelor's degree in Computer Science and bachelor's and master's degrees in aeronautical engineering. Her professional affiliations include ITEA, INCOSE, MORS, and SFTE.

Timothy Menke graduated from the University of Kansas with a BSAE in 1985, attended Officer Training School, and was assigned to the Aeronautical System Centers at WPAFB. In 1990, he joined the federal civilian service working in the Air Force Research Laboratories and completed his MSAE from the Air Force Institute of Technology in 1992. Mr. Menke completed his Juris Doctorate in Law from Capital Law School in 1998. His current assignment, within Aeronautical System Center, is the technical director in the Modeling and Simulation Division within the Capabilities Integration Directorate located at Wright Patterson AFB, OH. The modeling and simulation division supports the development of a number of Air Force and Joint programs and capabilities utilizing high fidelity, often emulative, virtual and constructive simulation. Linked with live test resources, the environment provides a mission effectiveness based assessment capability to provide insight to acquisition and test decisions.