



OFFICE OF THE DEPUTY ASSISTANT SECRETARY OF DEFENSE SYSTEMS ENGINEERING

System of Systems Engineering Collaborators Information Exchange (SoSECIE)

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Multi-Resolution Analysis (MRA): Applying Capability-Driven SoSE on the ISR Portfolio

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Abstract

The Department of Defense continues to seek ways to improve the acquisition of military capability to equip the warfighter for success in an ever increasingly complex operational environment to include the increased threat conditions that will be faced. The Air Force is committed to improve their requirements development and acquisition processes to accelerate fielding and sustainment of warfighting capability through organizational improvements and standardization of life cycle management processes resulting in delivery as promised. The goals of this effort are to deliver the right solutions, using the right life cycle strategies, and the right life cycle support by modifying our processes to accommodate diminishing personnel and financial resources.

The Air Force has struggled to date in delivering Systems of System (SoS) capabilities where a set or an arrangement of independent systems need to be integrated into a larger system to execute an operational effect and meet Air Force capability gaps. The problems are: no process exists to transform Mission-Specific gaps into System of System (SoS) capability requirements that can be allocated down to individual system level platforms, sensors, weapons, networks, etc...; lack of an integrated modeling, simulation and analysis capability that provides traceability from requirements to capability and that conducts operationally relevant trade-space analysis; and deficient organizational structure for life cycle management at the capability level.

This presentation will describe our strategy and process to assess operational effectiveness and life cycle cost early in the life cycle. It will mainly focus on our ISR Multi-Resolution Analysis (MRA) Pilot. MRA is a SoS analytic framework that enables holistic examination of detection, data fusion, and networks using five interactive analytic elements: engineering (physics based models), architecting, mission utility, programmatic, and decision analyses for traceable insights on capability. The process will address capability requirements development and allocation down to individual systems.

Biography

Mr. Mitchel Miller is the Chief Architect for the Air Force Materiel Command Engineering Division, Wright-Patterson Air Force Base, OH. As Chief Architect, he leads the Air Force's engineering process and policy improvement efforts for SoS Engineering and the allocation of MS&A resources for AFMC. Mr. Miller entered the Air Force in 1987 as an electrical engineer assigned to the Standard INS program where he performed specification development and integration into fighter and bomber aircraft. Following this, Mr Miller was assigned to the B-2 System Program Office as the lead engineer for navigation and communication system development and integration. From 2001 to 2010, Mr. Miller was the Chief Avionics Engineer on the C-5 AMP and RERP programs, the Chief Avionics Engineer for the



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Mobility Systems Wing, and the Chief Engineer for B-52 development programs. In 2010, he became the Chief Architect for the Air Force Lifecycle Management Center. Mr. Miller holds a BSSE from Wright State University and an MS in Engineering Management from the University of Dayton.

Mr. Douglas Owens is a senior analyst with TASC Inc. and leads an operations research team in Colorado Springs, CO. As the team lead and study director, he leads the development and application of analytic methods, tools, and processes in support of a variety of DoD and Intelligence Community organizations. He spearheads TASC's multi-resolution analysis process that integrates the practices of engineering, network, process, mission, and decision analyses into a collaborative trade environment to assess total enterprise capabilities. He led the OASD(NII) study "DoD-wide Integrated Modeling and Simulation in a Net-Centric Environment." Prior to joining TASC, Doug served 26 years in the Air Force in ICBM operations, acquisition management, operations analysis, and long-range modernization planning. During four assignments to the Pentagon spanning 13 years, Doug led 12 critical studies for the Joint Staff, SECAF, and Air Staff, to include the SECDEF's annual National Security Space Program Assessment, the AF Directed Energy Master Plan, Joint Strike Operations Roles and Missions analysis, the Mobility Requirements Study, and the Bottom Up Review Theater Air Defense Study. Doug holds a BS in Physics, an MBA, an MS in Operations Research, and an MA in National Security and Strategic Studies.

Mr. Timothy Menke is the Technical Director within the Modeling and Simulation division in the Program Development and Integration Directorate located in the Air Force Life Cycle Management Center at Wright Patterson AFB. The Modeling and Simulation division supports the requirement analysis within the Directorate, operates the Simulation and Analysis Facility (SIMAF), and executes analysis and assessments studies using Operator in the Loop, geographically distributed resources across AF and DOD facilities and ranges. SIMAF has a long history supporting network enabled warfare studies utilizing various network features and topologies to assess integrated capabilities. Mr. Menke has operated within and as part of numerous AF programs over his 28 year career. Mr. Menke has a BS in Aeronautical Engineering from the University of Kansas, an MS from the Air Force Institute of Technology, and a Juris Doctorate in Law from Capital Law School.