



## OFFICE OF THE DEPUTY ASSISTANT SECRETARY OF DEFENSE SYSTEMS ENGINEERING

### System of Systems Engineering Collaborators Information Exchange (SoSECIE)

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### SoS Considerations in the Engineering of Systems

*Dr. Judith Dahmann, The MITRE Corporation*

#### **Abstract**

This presentation presents the results of work undertaken by the Systems of Systems (SoS) Workstream of The Technical Cooperation Program (TTCP) Technical Panel on Systems Engineering for Defense Modernization. The Workstream has produced a paper, "Recommended Practices: Systems of Systems Considerations in the Engineering of Systems," based on the collective experience of the US, UK, Canada and Australia. Most defense acquisition in these nations is focused on the development and engineering of individual systems. National defense organizations as a rule allocate resources to individual systems and focus engineering attention on achieving system level objectives. However many systems require the ability to work as part of one or more system of systems. To be optimally effective, platforms, command and control networks, surveillance sensors, and other systems need to be developed with the operational context and their relationships with other systems considered. Consequently, the Workstream has focused attention on developing recommended practices for addressing SoS considerations throughout the development life cycle of defense systems. Unless the impact of the SoS context is considered early and throughout acquisition, there may be significant risk to the success of the system in meeting user needs. Based on collective experiences across the four Nations, a set of recommended practices has been developed to address this increasingly important area. The set of Recommended Practices provides a tool for systems engineers and acquisition programs to ensure that, from the outset, systems will be able to operate effectively in the SoS environment where they will be employed, and provide the required user capabilities while avoiding unnecessary rework and cost.

#### **Biography**

Dr. Judith Dahmann is a senior principal systems engineer in the MITRE Corporation Systems Engineering Technical Center. Dr. Dahmann is currently technical director in the Office of the Deputy Assistant Secretary of Defense for Systems Engineering in the US DoD Office of the Under Secretary of Defense for Acquisition, Technology and Logistics. In this capacity, she is part of a team working to develop approaches to the acquisition, development and systems engineering of integrated user capabilities with a focus on early systems engineering, advanced systems engineering applications and systems of systems, where she is the technical lead for the office. She led the development of the US DoD guide for systems engineering of systems of systems (SoS) and ongoing SoS engineering guidance, oversight and research. Prior to this, Dr. Dahmann was the Chief Scientist for the Defense Modeling and Simulation Office for the US Director of Defense Research and Engineering (1995-2000) where she led the development of the High Level Architecture, a general-purpose distributed software architecture for simulations, now an IEEE Standard (IEEE 1516). Dr. Dahmann holds a Bachelor's Degree from Chatham College in Pittsburgh, PA, spent a year as a special student at Dartmouth College, a Master's Degree from The University of Chicago, and a Doctorate from Johns Hopkins University.