



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

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

**May 20, 2014  
11:00 a.m. to Noon Eastern Time**

**A Decision Framework for Systems of Systems Based on Operational Effectiveness**

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**Abstract**

The ultimate goal of creating a system of systems (SoS) is to enable emergent behavior that enhances operational effectiveness. This emergent behavior can be characterized as SoS-level behavior (or force-level behavior in the case of a battle force SoS (BF SoS)) and is considered “emergent” based on its being greater (or providing more effectiveness) than the sum of its parts (the additive effectiveness of the constituent systems if they were each operating independently). Thus, the measurement of the SoS’ overall effectiveness is not merely the sum of the measures of effectiveness of each participating system. The SoS’ measure of effectiveness is based on a more complicated calculation that is dependent on the operational situation and the levels of effectiveness of particular attributes of the SoS’s constituent systems. The importance of determining and understanding SoS measures of effectiveness is that this knowledge is key to the decision framework for engineering successful systems of systems.

**Biography**

Ms. Bonnie Young is a professor of systems engineering at the Naval Postgraduate School. Her areas of research interest include systems of systems, complex systems engineering, automated decision aids for command and control, distributed sensor management, and data fusion. She has worked for Northrop Grumman and SAIC and supported the Missile Defense Agency, the Single Integrated Air Picture program, and Navy command and control programs. She has a bachelors degree in physics from Virginia Tech, a masters degree in systems engineering from Johns Hopkins, and is currently working on a PhD at the Naval Postgraduate School.