

## **INCOSE Webinar 79 – From Dual VEE to Dual Use – Introducing the SoS-VEE™ Model to Improve the Acquisition, Interoperability and Performance of large System-of-Systems (SoS) Programs**

**Presenter: Oliver Hoehne**

**Wednesday 22 July 2015, 11:00am EDT**

# **You're Invited.**

### **Abstract:**

**Problem Statement:** According to the Standish Group, very few large projects perform well to the project management triple constraints of cost, time, and scope. In contrast to small projects, which have more than a 70% chance of success, a large project has virtually no chance of coming in on time, on budget, and within scope. It is critical to break down large projects into a sequence of smaller ones ... and install stable, full-time, cross-functional teams that execute these projects following a disciplined approach.

However, this breakdown results in another set of challenges to the acquisition, interoperability and performance of larger programs. According to Northrop Grumman Chief Engineer John Clark (ret) the SoSE management processes (e.g. acquisition) are inadequate and pose the following challenges: there is no god (no overall program manager) of a SoS (Dr Larry Pulman), acquisitions are stovepipes (single systems, not SoS), systems are directed to "integrate" with other systems, often after fielding, suppliers don't cooperate with each other (they believe it's not in their best interest), acquirers don't cooperate with each other for the same reason, SoS costs more up-front to develop (but saves much more later), and interoperability is hampered by lack of SoSE.

**Offered Solution:** The author is making the case that large programs are in fact System of Systems whereby the individual projects represent the element systems of the overarching System of Systems. The INCOSE Systems Engineering Handbook describes seven typical challenges that influence the development of SoS projects, such as independent operation, different life-cycles, ambiguous requirements, complexity, and more. Focus is placed on controlling the interfaces between system elements and external interfaces, also verification and validation plays a critical role in replacing an older component system. The Dual VEE model has been introduced in the past to help better understand System of Systems Engineering (SoSE). Due to its complexity, however, SoSE continues to be one of the least well-understood Systems Engineering disciplines. An SoS-VEE™ model is proposed that is based on the concept of system hierarchy and the SE process as per MIL-STD 499B and EIA/IS-632. The SoS-VEE™ model is highly modular, scalable, and can be applied to both Family and System of Systems (FoS, SoS)

**Planned Presentation Content, Approach & Benefits:** The webinar will provide an overview of the challenges of System of Systems Engineering, derive the SoS-VEE™ model, provide a comparison to the Dual VEE model, illustrates how it can improve the acquisition, interoperability and performance of large System-of-Systems (SoS) programs while addressing the challenges and influences of SoSE. The SoS-VEE™ model will be able to serve as a powerful graphical representation of an otherwise complex engineering process, similar to the existing standard VEE model.!

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