Presentation One **– Keynote: "Mission Systems Architecture—What the Customer Really Needs" –** *Mark R. Hall***,** Raytheon Missile Systems' Chief Systems Architect and the Manager of the Systems Architecture Department

Demands for enhanced mission capability have historically driven system development. Today's capability-based acquisition environment and the demand for seamless interoperability places increased emphasis on architecture as a means to develop systems. The presentation will focus on how to architect mission solutions in a capability-based environment.

Presentation Two **– "Systems Engineering: From a Life Cycle Perspective, Disciplined Application of the SE Processes at Each Product Life Cycle Phase and Associated Lessons Learned/Opportunities"** – *John Groenenboom*, The Boeing Company is the Mesa Chief Engineer and Director of Rotorcraft Systems Engineering

Systems engineering is a process that is followed within each stage of the program life cycle. From the analysis of alternatives to the support stage, an understanding of the Systems Engineering process is essential. This process is a skill that must reside in all program personnel, and supports the application of technologies in specific scenarios. It is essential in complex systems, systems of systems, that the disciplined Systems Engineering process be applied to create an integrated solution. This requires both knowledge of the process and knowledge of the technologies; integrated within the individual contributors.

Presentation Three **– "System of Systems Architecting: Can we design for emergent system behaviors?"** *– Dr. Cihan H Dagli,* Professor of Systems Engineering, Computer Engineering and Engineering Management at the University of Missouri-Rolla

The world is facing an increasing level of systems integration leading towards Systems of Systems (SoS) that adapt to changing environmental conditions. The number of connections between components, the diversity of the components and the way the components are organized can lead to different emergent system behavior. Therefore, the need to focus on overall system behavior is becoming an unavoidable issue. The problem is to develop methodologies appropriate for better understanding behavior of system of systems before the design and implementation phase. This talk focuses on Complexity Theory and the tools used for analysis of complex adaptive systems with the aim of identifying areas that need methodology customization for SoS analysis.

Presentation Four**– "Systems Architecture and Engineering"** *– Dr. K. Larry Head*, The University of Arizona, Systems and Industrial Engineering Department Head

The development of system architectures for large-scale complex systems requires both creative insight and analytical understanding of the domain. The art of systems architecting is similar to the art of creative writing where the architect utilizes knowledge and experience with legacy systems, new technological developments, and with customer and user preferences. Successful architectures depend on this creativity as well as detailed understanding of quantitative system measures of performance and resource utilization.

Presentation Five **– "Systems Architecting"** *– Dr. Stan Settles*, University of Southern California, Systems Architecting and Engineering Program Director and Epstein Department Associate Chair

This presentation looks at systems architecting as it originated with Dr. Eberhardt Rechtin at USC in 1987 and how it has advanced since then. The emphasis is on the design process as compared to the architectures that result from the design process. The author will use a project that he is currently architecting to illustrate many of the concepts.

Presentation Six **– "INCOSE (International Council of Systems Engineering): System Architecting Opportunities"** – *Carl Landrum*, INCOSE Corporate Advisory Board member for Honeywell and Engineering Leader for Maintenance Systems, On and Off Board for Honeywell Aerospace

An overview of INCOSE will be presented to include its purpose and organizational structure. A brief description of its Technical Matrix and alignment of the working groups will be presented followed by a more detailed look at the Architecture Working Group to include any initiatives, accomplishments and future plans. The presentation will close out with excerpts from INCOSE's vision 2020.

Presentation Seven **– "COSYSMO (Constructive Systems Engineering Cost Model) Overview"** – *Dr. Ricardo Valerdi*, Massachusetts Institute of Technology, Lean Aerospace Initiative Research Associate and Engineering Systems Division Lecturer

The Constructive Systems Engineering Cost Model (COSYSMO) is an industry-government-academia initiative to develop a systems engineering cost model that can help engineers and program managers make better economic decisions related to systems engineering. This presentation will provide an overview of the model and the associated inputs and outputs. Lessons learned from development and validation of COSYSMO will be shared in addition to a preview of the latest improvements of the model.

Presentation Eight **– "OMG SysML ™ (Object Management Group Systems Modeling Language) Overview" –** *Paula Obeid*, Embedded Plus, President

***Breakout Session A* – "COSYSMO Applied"** – *Dr. Ricardo Valerdi,* Massachusetts Institute of Technology, Lean Aerospace Initiative Research Associate and Engineering Systems Division Lecturer

Building on the first presentation, a more detailed discussion surrounding the limitations of the model will be provided as well as a description of research projects focused to address them. Further information will be provided on how to calibrate COSYSMO to your organization and how to use an associated adoption process to improve institutionalization success. The discussion will conclude with a demonstration of the COSYSMO tool.

***Breakout Session B* – "Master of Science in Engineering Education"**

***Breakout Session C* – "Model Driven Development with SysML to Support Effective Systems Engineering"** – Gavin Arthurs, Telelogic, Sr. Applications Engineer

Specifying requirements, system structure, interfaces and behavior are essential parts of systems architecting and systems engineering. With the introduction of SysML™ 1.0, combined with Telelogic's Rhapsody® -- the leading embedded and real-time SysML engineering solution, systems architects and engineers can now employ Model-Driven Development to easily capture, link and work with requirements and clearly and unambiguously describe systems. Join us in this presentation and live demonstration to see how you can leverage Rhapsody's key enabling technologies to support effective system architecting and engineering.