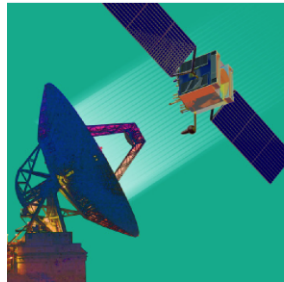


Working Group Outbrief

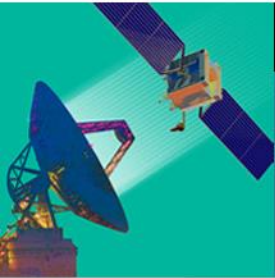
Ground System Architectures Workshop



Session 11A

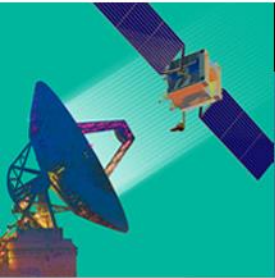
Evolving Model-Based Engineering Practices and Integrating Model-Based Engineering Across Enterprise, System, and Software Levels

Ryan Noguchi and Robert Pettit IV, The Aerospace Corporation



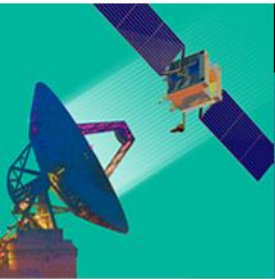
Session Goals

- This working group is intended to foster a mutually beneficial discussion of the community's lessons learned from the research, demonstration, and early adopters of MBSE approaches
- This will be a free and open discussion on needs and challenges for model-based engineering, particularly how they could improve the acquisition and development of systems and services for satellite ground systems
- Discussion will be driven by interests expressed by participants



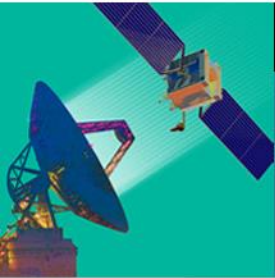
Presenters/Panelists

- NONE



Key Points

- **Model-based techniques needed to deal with growing complexity**
- **Rigor of modeling ferrets out inconsistencies and defects early and often**
 - Evolutionary improvement to systems and software engineering
- **Use cases and mission threads to guide verification process**
- **Large views vs. small views vs. COTS tools for visualization**
- **Integrating system models with cost models**
 - Challenge for one-off systems and large-scale system evolution
- **Training and education across workforce, cultural challenges**
- **Benefits of MBSE, metrics and success stories, sharing positive anecdotes**
- **Barriers to adoption of MBSE**
- **Auto-code-generation**
- **How to facilitate collaboration and sharing of best practices**
- **Challenges to sharing of models due to proprietary and IA concerns**
- **Tool interoperability, standards, style guidelines**



Conclusions

- **MBSE critical for handling the complexity of modern systems**
 - Gives you the best chance for success
- **Modeling exposes the holes in the collective knowledge**
- **MBSE effort is more front-loaded than traditional SE**
 - Benefit on the back end in reducing late discovery of defects
 - But benefits can be seen early in accelerating trade studies and impact analysis
- **More training and education needed to familiarize people with the benefits of using the model vs. traditional methods**
 - Importance of ambassadors to bridge cultural gap between core modelers and SMEs/stakeholders
- **Modeling should be focused on the key questions to be answered**
- **The model is the authoritative reference of the collective knowledge**
 - The views provide the mechanism for communication