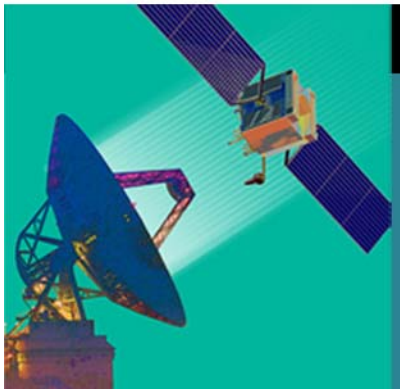
Working Group Outbrief

Ground System Architectures Workshop



Session 11F

Model-Based Systems Engineering (MBSE) Approaches for Complex System Acquisition

Ryan Noguchi, Rob Pettit, The Aerospace Corporation

Session Goals

- Address growing trends of applying model-based engineering (MBE) in complex systems
- Open discussion on the needs and challenges for model-based engineering
  - Lessons learned for successes and challenges
  - Tool support and capabilities
  - Large-scale integration of MBE
  - Process issues with incorporating MBE
  - Model verification and validation
  - Modeling standards / practices
  - Experiences with automated code generation
  - Effects on cost and schedule

Presenters/Panelists

- Open discussion led by co-chairs
- 22 attendees
  - Mix of Aerospace, government, contractors

Key Points

- Many facets of MBE
  - Software, systems, system of systems
- Must understand context of MBE adoption for each project
- New cost/schedule estimation techniques needed
  - Function points vs. SLOC count more appropriate for MBE
  - How do you estimate cost avoidance from rework that doesn't happen?
- Tool support
  - Compliance with modeling language standards (SysML, UPDM, DoDAF)
  - Round-trip engineering capabilities
  - Interoperability
- Cross-discipline integration
- Education / training
  - Developers and stakeholders
  - Grass-roots sharing of best practices

Conclusions

- MBE has promise for managing increased complexity
  - Model must be treated as the primary artifact (and a deliverable)
- Open issues include
  - System-wide adoption of MBE
  - Integration with multiple engineering disciplines
  - Maintaining code/model consistency over time
  - Cost/schedule estimation
  - Configuration management
  - Verification and validation of models
- Collaboration across professional community needed
  - Capture lessons learned and advance best practices