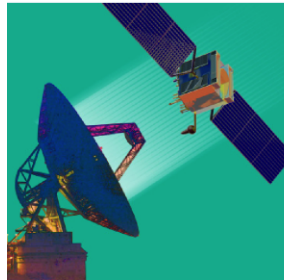


Working Group Outbrief

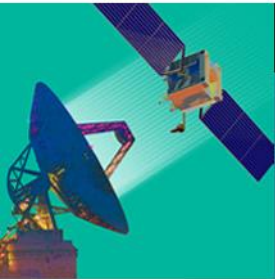
Ground System Architectures Workshop



Session 11A

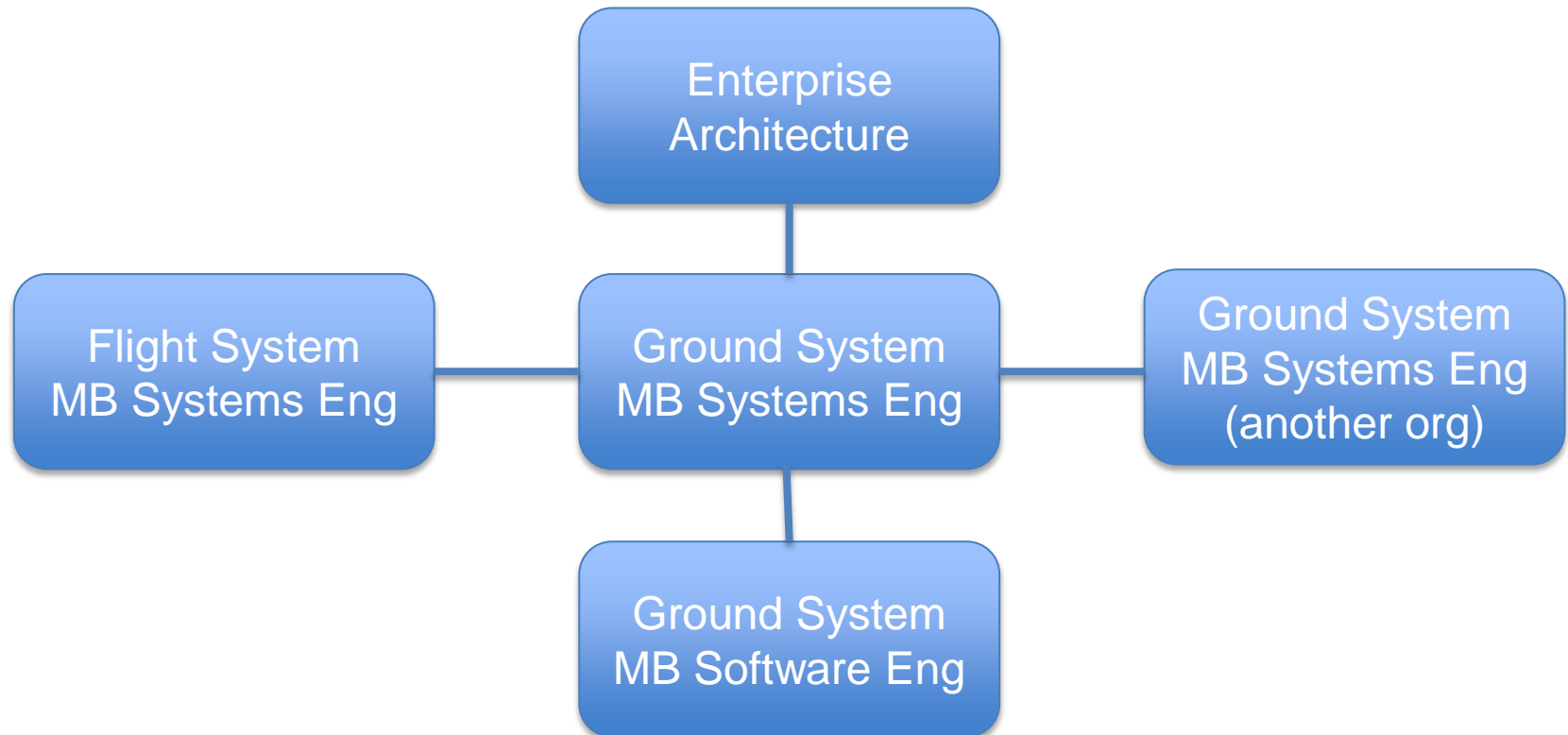
Model-Based Systems Engineering (MBSE)
Approaches for Complex System Acquisition

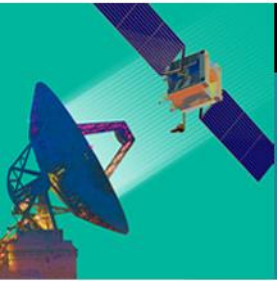
Ryan Noguchi, Robert Pettit IV, The Aerospace Corporation



Session Goals

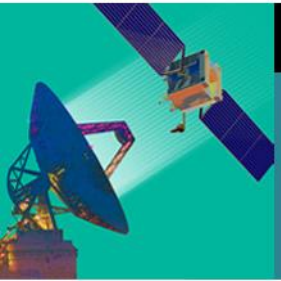
- Open discussion on application of model-based engineering (MBE)





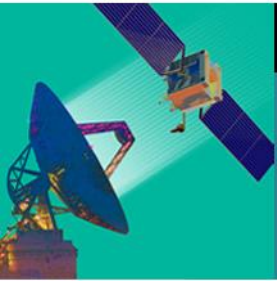
Key Points - Benefits

- MBSE shows great promise for ground systems
 - Helps to manage complexity (both product and process)
 - Enables early V&V
 - Improves analytical insight
 - Early discovery of requirement or architecture problems
 - Greater consistency
 - Better communication
 - Model is a single source of analyzable truth
 - Improves management of cross-cutting concerns
 - Facilitates decision-making with better enterprise context



Key Points - Challenges

- Acquisition policy and practice needs to evolve to incorporate models as primary artifact
 - Requirement Specification and CDRLs integrated with MBSE
 - Formats, standards, content, views, scripts, policy, contracts
 - Transition from textual requirements to models as requirements
- Human issues
 - Models can hide or emphasize factors based on human biases
 - MBSE not a “silver bullet” that can fix all bad SE practices
- Integrating enterprise, system, and software models not trivial
- A wide range of tools are being used for system modeling
 - But model interchange between tools is still poor
 - ESA studying non-UML-based approaches



Conclusions

- Tools have come a long way, but interoperability challenges remain
- Integration between levels is needed for best results
 - Enterprise \Leftrightarrow System \Leftrightarrow Software
- More effort needed to address acquirer-to-builder interface gap
- How do we incentivize programs to incorporate MBSE to improve the likelihood of successful outcomes?
 - Success stories needed to help close business case
 - Look for the “small wins” and copy them
 - Bring MBSE success stories to GSAW
- Can we take advantage of crowdsourcing opportunities to seek innovative approaches to addressing MBSE challenges?