Model-Based Systems Engineering

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Model-Based Engineering Summit
National Institute of Standards and Technology
Gaithersburg, MD | December 18, 2013
DAG Ch 4: Various Applications of Modeling and Simulation

Modeling and Simulation in the DoD Acquisition Life Cycle
“Weapon System Development”

Analysis of Alternatives
- Concept of Operations (CONOPS) modeling
- Cost / schedule / performance trades
- System interoperability discoveries
- Portfolio coverage analysis

Analysis of Alternatives
- Assess materiel solutions
- Estimate life cycle costs
- Model CONOPS and mission context
- Interoperability and warfighter integration analysis
- Industrial / manufacturing capability analysis
- Supportability and sustainment modeling

Technology Maturation and Risk Reduction
- Trade studies
- System threat integration
- Model environment and demonstrate technology
- Interoperability and supportability analysis
- Operational suitability and affordability
- Industrial / manufacturing capability and readiness assessment
- Estimate manpower / cost
- Model system to performance specifications
- T&E planning
- Human interface prototyping

Develop Affordable and Executable Manufacturing Process
- Ensure operational supportability
- Reduce logistics footprint
- Survivability analysis
- Human Systems integration (HSI)
- Design for producibility
- Demonstrate system safety
- Verify functionality and performance to specifications / needs
- Manpower estimates

Manufacturing Development
- Industrial / manufacturing readiness assessment
- Environment, Safety, and Occupational Health (ESOH) models
- Military equipment valuation
- Corrosion prevention and control
- Refine LCSP
- Production qualification testing
- Verify and validate production configuration
- Economic analysis

Post-Production Support
- Supply chain management
- Monitor performance and adjust product support
- Training
- Supportability assessments
- Disposal planning
- Validate failures and determine root causes
- Determine system risk / hazard severity
- ECP impact analysis
Who Are the Stakeholders?

- Systems Engineering
- Analysis
- Sustaining
- Training
- Decision Making
- Program Management
- Business Management
- Senior Leadership
- Life Cycle Logistics
- Production
- Design
- Documenting
- Test and Evaluation
- Source Selection
- Systems Architecting
- Program Protection
- Affordability
- Human Systems Integration

Need to identify the value propositions to/from stakeholders and others that contribute to system model

- Participants need tangible benefits for making contribution – carrot not stick