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Establish M&S-related Guidelines for Solicitations, Source Selections, and Contracting

Acquisition Business Plan

Action 1-5

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Tasking

Establish M&S-related guidelines for solicitations, source selections, and contracting.

RATIONALE: There are insufficient guidelines regarding contracting for M&S and the data it needs or produces. Acquisition programs often leave M&S planning, use, and ownership to prime contractors. Government organizations are often unaware of contractor attributes that are indicators of M&S capability maturity and are, therefore, useful criteria in evaluating proposals. Rarely is early consideration and contractual direction specifically intended to provide access to, or reuse of, models and data across the life-cycle.

DISCUSSION: The recommended RFP language and contract provisions should address M&S strategy; representation requirements; M&S tool sources; ownership and maintenance; data sources and rights; VV&A; user support; access control; and metrics and documentation requirements, all across the system life-cycle. The source selection criteria guidance should address those contractor attributes that have a direct relationship to successful M&S use.

LEAD: USD(AT&L)/DS

SUPPORT: USD(AT&L)/ Defense Procurement and Acquisition Policy (DPAP), DOT&E and Components

PRODUCTS: Sample language and suggested criteria in DAG. Updates to Federal Acquisition Regulations (FAR) as appropriate. Contract Data Requirements List (CDRL) or a family of CDRLs listing the M&S requirements for an RFP.

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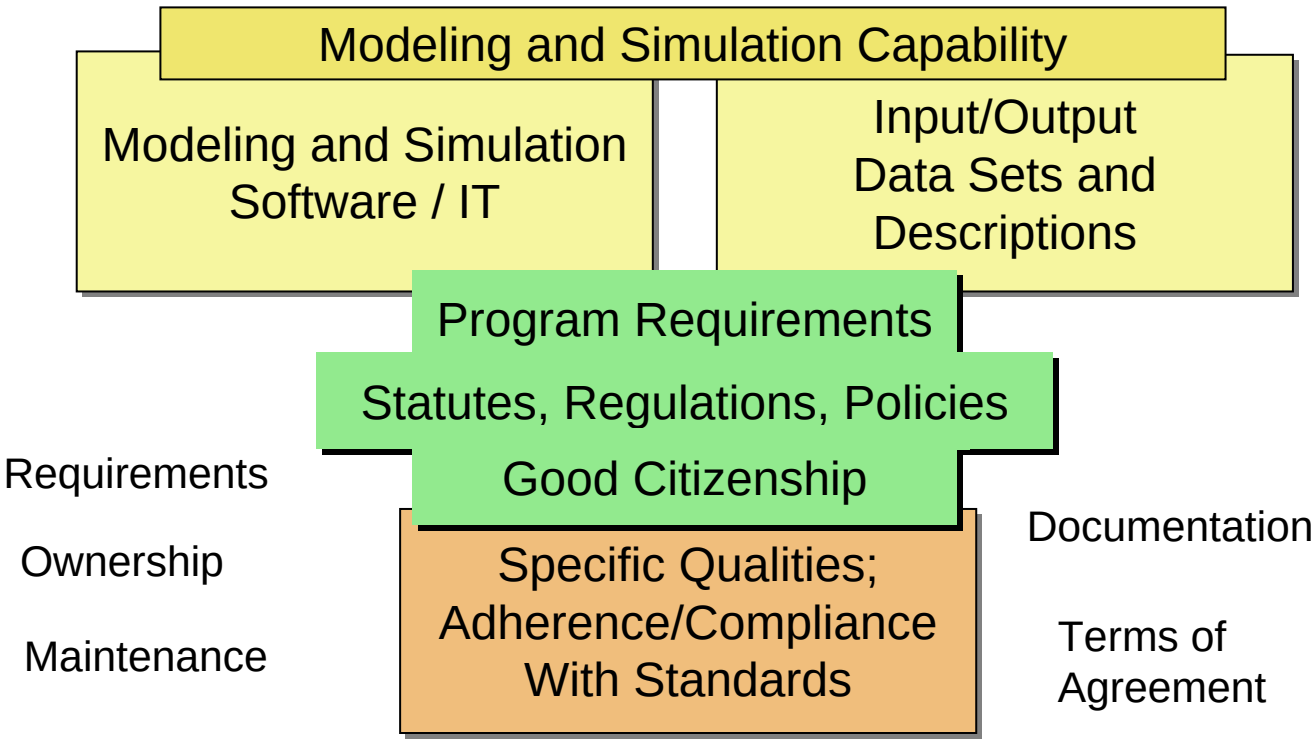
Decomposing the Problem

"The PM shall plan for M&S throughout the acquisition life cycle. The PM shall identify and fund required M&S resources early in the life cycle" – DoDI 5000.2 E5.1.10



"The SOW should specify in clear, understandable terms the work to be done in developing or producing the goods to be delivered or services to be performed by a contractor. Preparation of an effective SOW requires both an understanding of the goods or services that are needed to satisfy a particular requirement and an ability to define what is required in specific, performance-based, quantitative terms." – MIL-HDBK-245D

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Action Deliverables

- Objective: Help the Program Manager plan for, request and get what they need
  - Raise questions for consideration
  - Advise on appropriateness of request and completeness and quality of response
  - Provide boilerplate and “fill in the blank” RFP and contract language
  - Recommend ways to apply guidance and language to align THEIR acquisition/procurement documentation with a program Life-cycle and DoD Enterprise view

- Forms
  - M&S Acquisition Guide. 8-10 pages providing questions, measures, langauge and application principles for their consideration
    - Managed AT&L publication?
  - Influence. DoD and component acquisition and procurement regulations, policies and guidance.
    - FAR; DFARS; DoDD 5000.1; DoDI 5000.2; DoD component policy and guidance
    - *Defense Acquisition Guidebook*
    - *Guide for Integrating Systems Engineering into DoD Acquisition Contracts*
  - Continuous Improvement. Establish a process to collect lessons learned, update M&S Acquisition Guide and target reviews and updates of DoD regs, policies and guidance

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Modeling and Simulation

MODEL: The knowledge and understanding that the scientist has about the world is often represented in the form of models. … *A model is a representation containing the essential structure of some object or event in the real world.* – From Introductory Statistics: Concepts, Models, and Applications by David W. Stockburger

predict

understand

evaluate

SIMULATION: The process of designing a model of a real system and conducting experiments with this model for the purpose either of understanding the behavior of the system or of evaluating various strategies (within the limits imposed by a criterion or set of criteria) for the operation of the system." from Introduction to the Art and Science of Simulation; 1998 Winter Simulation Conference 1998. R.E. Shannon.

executable Knowledge

MODEL: A representation of a system that allows for investigation of the properties of the system and, in some cases, prediction of future outcomes. Models are often used in quantitative analysis and technical analysis, and sometimes also used in fundamental analysis. – From "InvestorWords"

a way of thinking and reasoning about systems

The Essence of Intellectual Property

Essential structure

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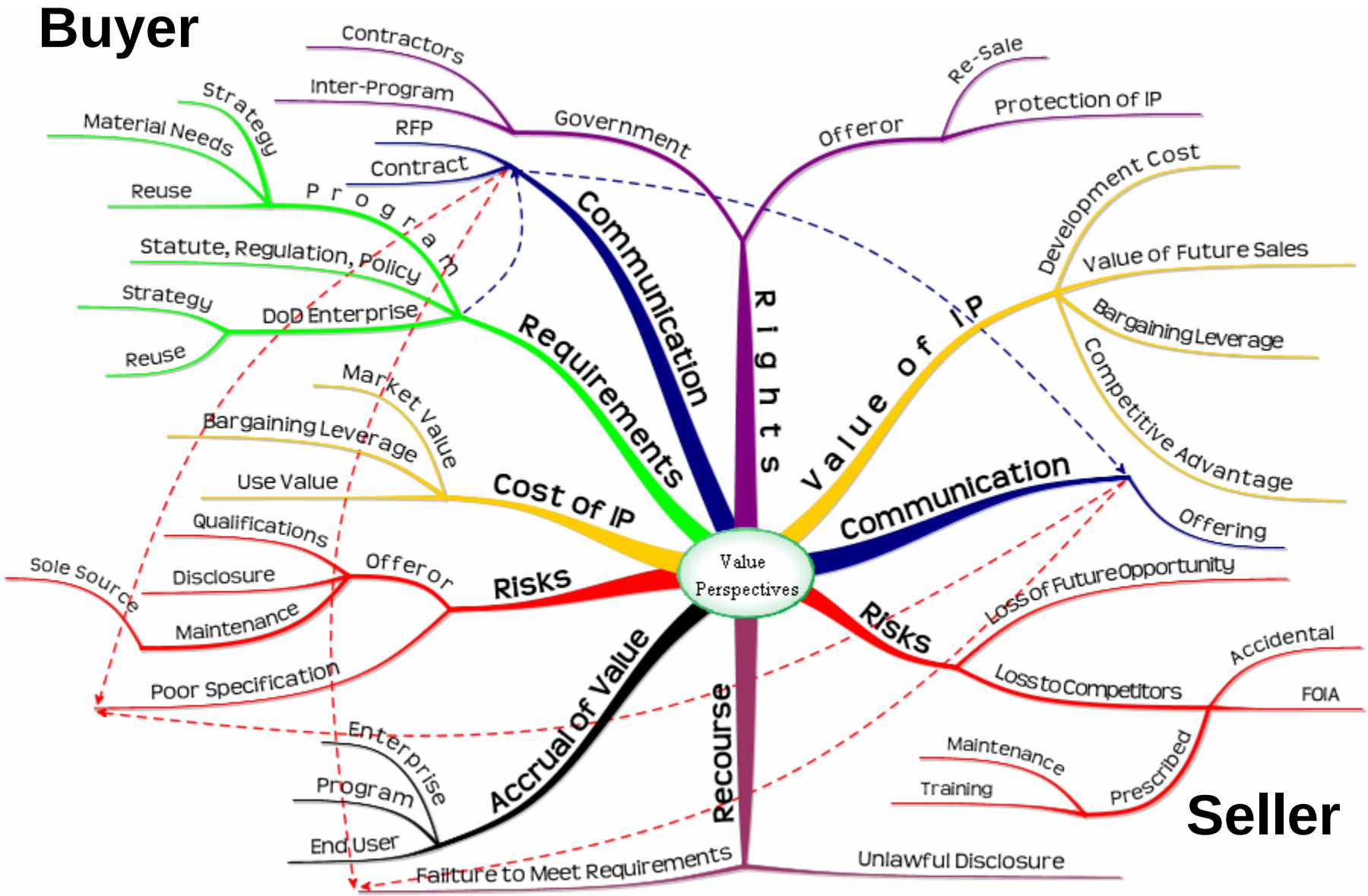
Value Perspectives



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Other Considerations for M&S Acquisition

- Have a Rigorous M&S Planning Process
- Have an DoD Enterprise/Life-cycle Perspective
  - Discovery, Access, Interoperability, Reuse
- Have a VV&A plan

- Seek to leverage the best use of M&S capabilities from industry and government
  - Avoid building new capability when existing assets can be used
  - Strongly consider COTS solutions; resist temptation to favor custom solutions
- Seek to maximize value for the government
  - Understand market value of proposed IP
  - Maximize bargaining leverage by identifying requirements in the competition phase.
  - Be explicit about minimizing risk of exposure of IP
- Understand time-dependence of need
- Consider DoD Enterprise and Life-cycle Issues
  - M&S Strategy / Vision
  - Reuse and interoperability standards.
  - Assure M&S and associated data are available for other users throughout the system's life-cycle.
- Protect proprietary and intellectual property rights of M&S developers.

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Statute, Regulation, Policy (e.g.)

- Title 5 U.S. Code Section 552; “Public information; agency rules, opinions, orders, records, and proceedings” -- FOIA
- Title 10 U.S. Code Chapter 137; “Procurement Generally”
- Title 10 U.S. Code Chapter 140; “Procurement of Commercial Items”
- Title 10 U.S. Code Chapter 141; “Miscellaneous Procurement Provisions”
- Title 18 U.S. Code; “Crimes and Criminal Procedures” – Trade Secrets Act, Economic Espionage Act
- Title 15 U.S. Code; “Commerce and Trade”
- Title 17 U.S. Code; “Copyrights”
- Title 35 U.S. Code; “Patents”
- Title 41 U.S. Code; “Public Contracts”
- Uniform Trade Secrets Act (compilation of State laws)

- Federal Acquisition Regulation (FAR)
- Defense Federal Acquisition Regulation Supplement (DFARS)
- International Traffic in Arms Regulations (ITAR)

- DoD Instruction 5000.2, “Operation of the Defense Acquisition System,” May 12, 2003.
- DoD Directive 8000.1, “Management of DoD Information Resources and Technology,” February 27, 2002.
- DoD Directive 8320.2, “"Data Sharing in a Net-Centric Department of Defense", December 2, 2004.
- DoD Instruction 5000.61, "DoD Modeling and Simulation (M&S) Verification, Validation, and Accreditation (VV&A)," May 13, 2003.
- SECNAV Instruction 5200.40, “Verification, Validation and Accreditation (VV&A) of Models and Simulations,” April 19, 1999.
- COMOPTEVFORINST 5000.1, “Use of Modeling and Simulation (M&S) in Operational Test (OT),” September 9, 2004.

- MIL-HDBK-245D, “DoD Handbook for Preparation of Statement of Work,” April 3, 1996.
- MIL-HDBK-61A(SE), “Configuration Management Guidance,” February 7, 2001.
- DoD VV&A Recommended Practices Guide, 2004.
- DoD 5000.59-M, “DoD Modeling and Simulation Glossary”, Jan 1998.

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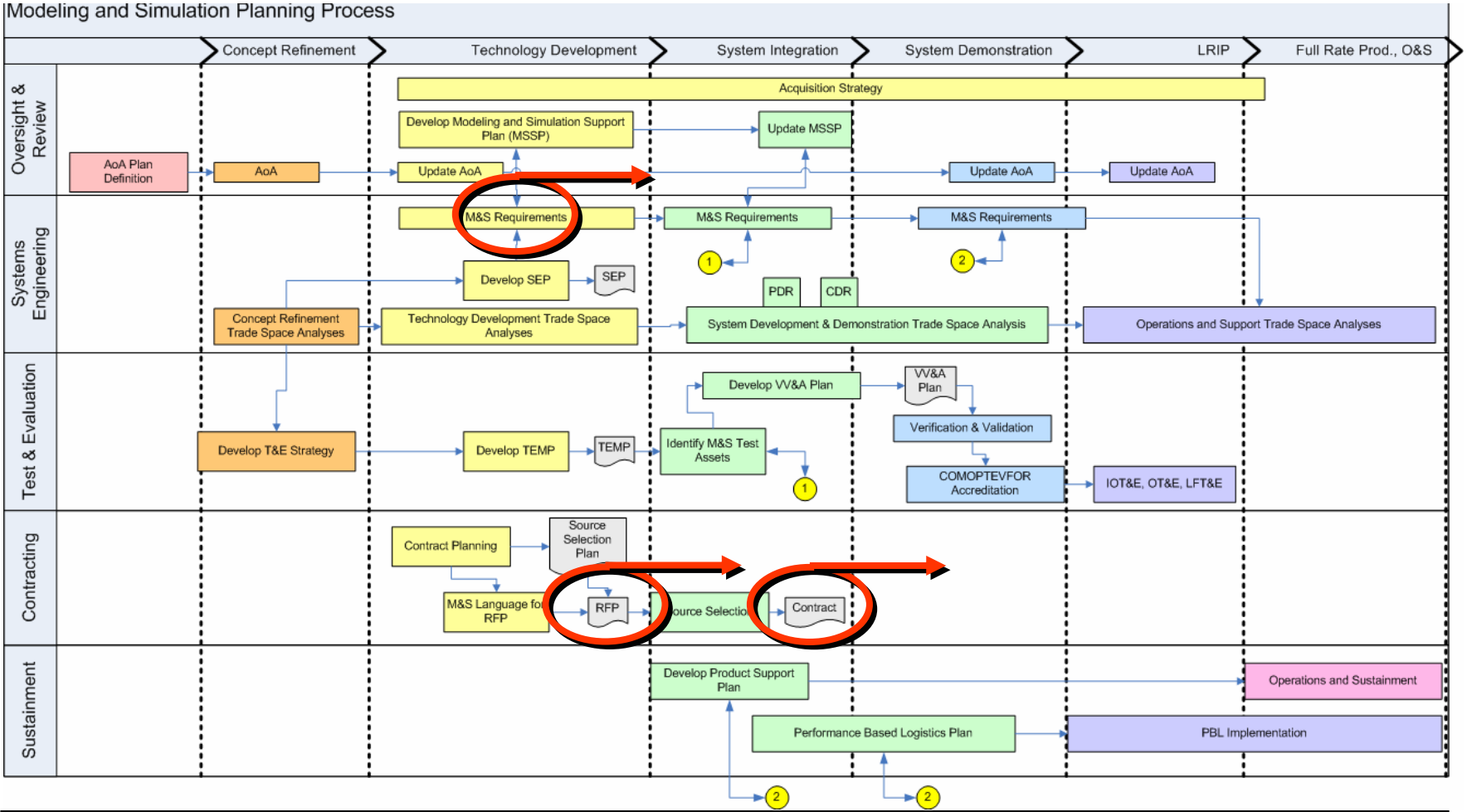
A Planned, DoD Enterprise/Life-cycle Commitment



RFP and Contracting Guidance has Little Value Without an M&S Plan

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Proposed Considerations for RFP

- What New Modeling and Simulation Capabilities are Required?
  - How will the capabilities be used?
- Can the details of the requirement be clearly articulated in the RFP?
- Are there existing assets, currently available to the government, that can be applied to all or part of the requirement?
  - Appropriate pedigree
  - Appropriate for use
- What are the applicable model parameters, standards, interfaces, interoperability, and output requirements?
  - Alignment with Program and DoD Enterprise Goals
- What level of rights to the input/output data be required?
  - Access, Publish and Modify
  - Consider fixed-price options to purchase data rights downstream

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Proposed Source Selection Considerations

- Technical
  - Feasibility of Proposed Solution
  - Availability of Required Data
- Value
  - Cost v. Benefit
  - Risk
- Spirit and Letter of the RFP
  - Meets Requirements
  - Meet Demands of Program and DoD Enterprise Strategy
  - Fitness for Use
  - Pedigree
  - Adherence to standards or provide reasonable argument for exemption
- Life-cycle Implications
  - Use Costs
    - Operations
    - Maintenance
    - License fees
  - Continued Support – Commitment to Sole Source?
- Offeror Qualifications
  - Documented systems-engineering process
  - Existing information sharing infrastructure
  - Successful experience using a wide of models and simulations
  - Successful application and demonstration of M&S interoperability and reuse standards
  - Documented VV&A process
  - Staff with documented M&S expertise
- Data Rights
  - Access to required input and output data.
  - Rights to use, publish and modify data as required
  - Are there fixed-price options for purchasing data rights later in the acquisition process?

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Example Contract Language / Standard Clauses

- Rights in non-Commercial Software and Documentation (from DFARS)
- Rights in Technical Data – Non-Commercial (from DFARS)
- Quality Assurance (from clauses to sub-contractors to Boeing working NASA ISS)
- Software Management (from FCS)
- Data Formats; Data Content; Data Procedures (from U.S. Army Corps of Engineers – CADD)
- Offeror Qualifications (from Space Based Radar Task Order)
- NAVSEA SEAPORT-e
  - **Modeling, Simulation, Stimulation, and Analysis Support**
  - This functional area consists of the application of a standardized, rigorous, structured methodology to create and validate a physical, mathematical, or otherwise logical representation of a system, entity, phenomenon, or process. The functional area involves the use of models, including emulators, prototypes, simulators, and stimulators, either statically or over time, to develop data as a basis for making managerial, technical, strategic, or tactical decisions.

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Summary

- Have a Rigorous M&S Planning Process and Documented Plan
  - VV&A Plan
  - Configuration Management Plan
  - Reference document in RFP and Contract
- Have an DoD Enterprise/Life-cycle Perspective
  - Discovery, Access, Interoperability, Reuse

- Next Steps
  - Continue to refine guidance/considerations
  - Review existing RFPs, Contracts, etc
  - Socialize and with Industry and Government Players
    - Technical Personnel
    - Contracts Personnel
    - Legal Personnel
  - Publish M&S Acquisition Guide
  - Develop plan to influence DoD and component regulations, policies and guidance
  - Establish Continuous Improvement Process

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Example Proposed Contracting Language Considerations

The Contractor Shall:

- Develop, update and maintain M&S capability in compliance to a documented configuration management process.
- Describe his use of M&S throughout the system's lifecycle as an integral part of the Systems Engineering Plan.
- Develop, implement, and update M&S planning describing the contractor's use of M&S in the development of the system as an integral part of the Systems Engineering Plan.
- Collaborate with the government to develop a system model using architectural modeling tools in order to achieve mutual understanding of the system under development.
- Perform VV&A of modeling and simulation capabilities consistent with risk and DoD M&S VV&A Instruction 5000.61.
- Develop, and make accessible to the government an virtual representation of its system in the form of a model or simulation.
- Include in its participation in the required program reviews, performance of the system under development using simulations demonstrations with M&S developed by the contractor.