~~28~~ 27 Steps to Success:
The DoD Acquisition M&S Master Plan
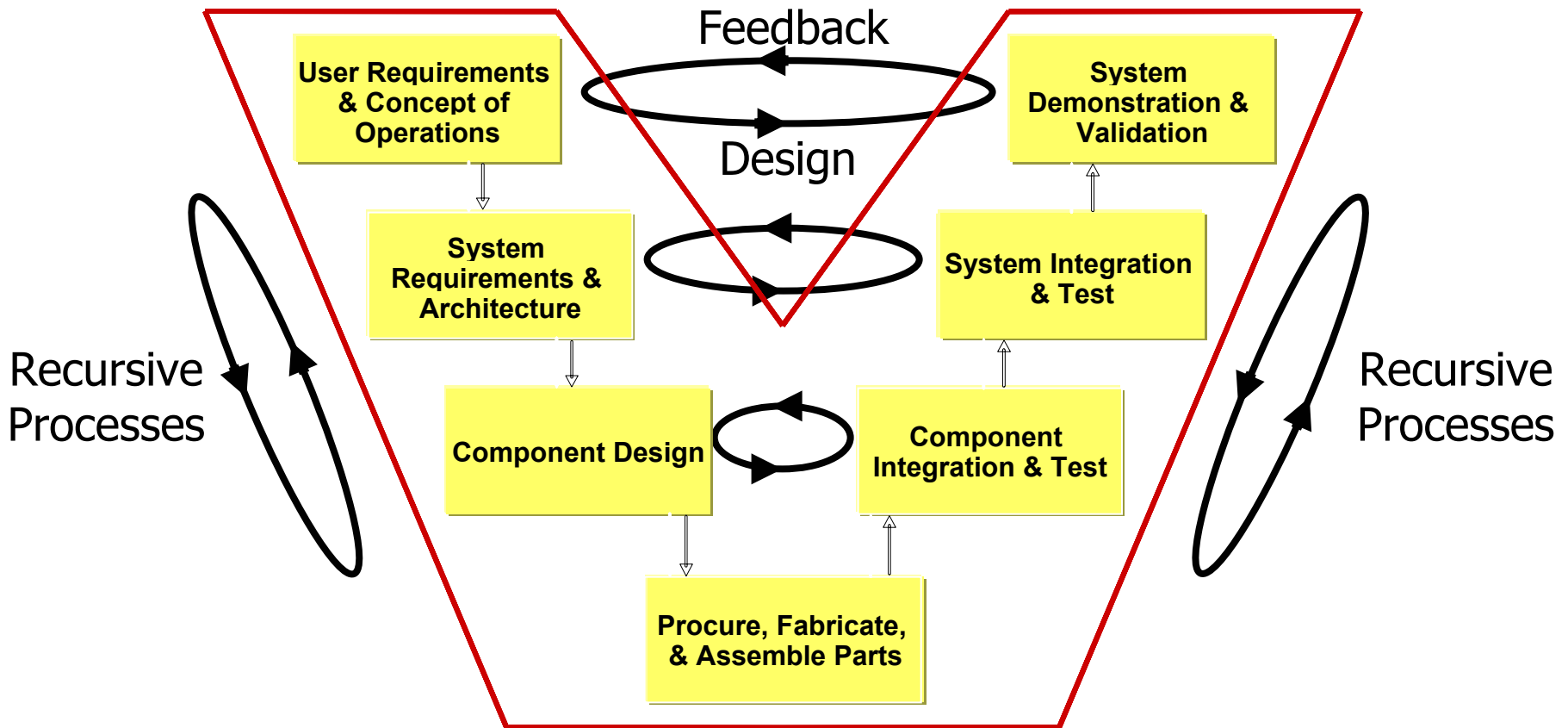
22nd Annual National Test & Evaluation Conference

Fred Myers, OUSD (AT&L) DS/SE
Chair, Acquisition M&S Working Group

March 9, 2006

M&S is a Necessary Part of Acquisition

M&S is broadly useful to enable systems engineering throughout a system or S-o-S life cycle

Feedback

Design

User Requirements & Concept of Operations

System Requirements & Architecture

Component Design

Procure, Fabricate, & Assemble Parts

System Demonstration & Validation

System Integration & Test

Component Integration & Test

Recursive Processes

Recursive Processes

"Help drive good systems engineering practices back into the way we do business."
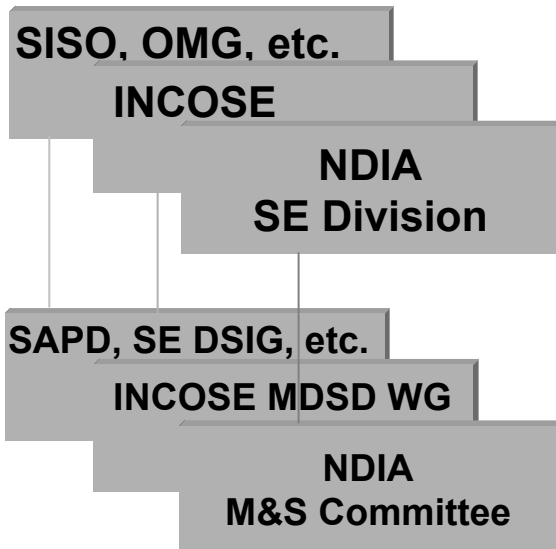*Under Secretary of Defense for Acquisition, Technology and Logistics*
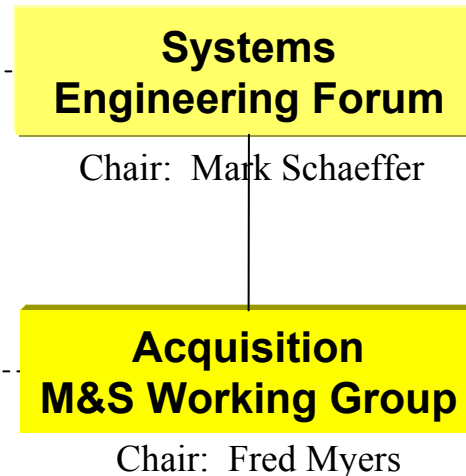
Acquisition M&S Working Group
Established by SE Forum Feb 2005, to define a plan to solve the problems

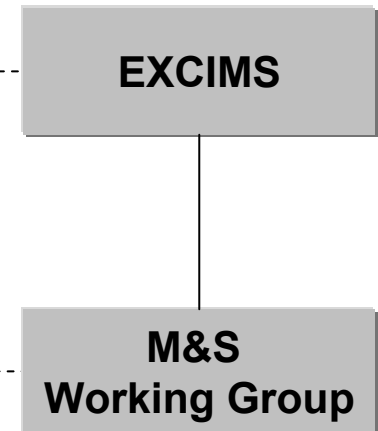## …anchored in acquisition community, linked to industry and M&S

Industry / Academia	DoD SE	DoD M&S
SISO, OMG, etc.		
INCOSE		
NDIA SE Division	Systems Engineering Forum	EXCIMS
	Chair: Mark Schaeffer	
SAPD, SE DSIG, etc.		
INCOSE MDSD WG		
NDIA M&S Committee	Acquisition M&S Working Group	M&S Working Group
	Chair: Fred Myers	

Products	Product	Product
Reports (e.g., "M&S Support to the New DoD Acq. Process"), standards, papers, etc.	***Acquisition M&S Master Plan***	*DoDI to Implement DoDD 5134.01*

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A Sampling of DoD's M&S Problems

❑ Minimal reuse of M&S & data; hard to discover reusable resources; insufficient info to evaluate reuse candidates; no incentives to re-use

❑ No contractual guidelines for M&S and data needs

❑ No DoD requirement for formal M&S planning to support acquisition

❑ Lack of agreed standards for interchanging information

❑ No conceptual framework for data interchange

❑ Many M&S tool gaps and deficiencies

❑ M&S developers - not M&S users - tend to drive M&S development

❑ No readily-available L-V-C distributed environment

❑ VV&A often weak or non-existent; documentation inconsistent

❑ No business model for developing, using, maintaining M&S capabilities

❑ Acquisition community managers (and staffs) are mostly uninformed about M&S capabilities and limitations

❑ Body of knowledge for M&S support to acquisition is deficient, not managed

Acquisition M&S Master Plan Development Process

❑ Bottoms Up:
- ➢ Assessed recommendations from prior studies on M&S in Acquisition
- ➢ Assessed current issues and needs (today's SoS efforts)

❑ Top Down (Desired Acquisition Environment):
- ➢ DoDD 5000.1
- ➢ CJCSI 3170.01

❑ Identified gaps to better enable Acquisition M&S

❑ Identified actions to address the gaps for Acquisition M&S

❑ Identified actions of others (e.g., DMSO, NII, Services)

❑ Documented actions, lead organizations, and completion dates in the draft Acquisition M&S Master Plan

27 Steps to Success

❑ 27 Needed Actions

❑ Each Action
  ➢ Rationale (Why is it needed?)
  ➢ Discussion (What is the specific action?)
  ➢ Lead & Supporting Organizations (Who is involved?)
  ➢ Products (What is the product?)
  ➢ Completion Goal [year] (When will the action be completed?)

❑ Execution Management

5 Acquisition M&S Objectives; 27 Actions

Objective 1
Provide necessary policy and guidance

Actions

1. M&S management
2. Model-based systems engineering & collaborative environments
3. M&S in testing
4. M&S planning documentation
5. RFP & contract language
6. Security certification

Objective 2
Enhance the technical framework for M&S

Actions

7. Product development metamodel
8. Commercial SE standards
9. Distributed simulation standards
10. DoDAF utility
    - DoDAF 2.0 Acqn Overlay
    - Standards for depiction & interchange
11. Metadata template for reusable resources

Objective 3
Improve model and simulation capabilities

Actions

12. Acquisition inputs to DoD M&S priorities
13. Best practices for model/sim development
14. Distributed LVC environments
    - Standards
    - Sim/lab/range compliance
    - Event services
15. Central funding of high-priority, broadly-needed models & sims
    - Prioritized needs
    - Pilot projects
    - Expansion as warranted

Objective 4
Improve model and simulation use

Actions

16. Help defining M&S strategy
17. M&S planning & employment best practices
18. Foster reuse
    - Business model
    - Responsibilities
    - Resource discovery
19. Info availability
    - Scenarios
    - Systems
    - Threats
    - Environment
20. VV&A
    - Documentation
    - Risk-based
    - Examination
21. COTS SE tools
22. M&S metrics

Objective 5
Shape the workforce

Actions

23. Definition of required M&S competencies
24. Harvesting of commercial M&S lessons
25. Assemble Body of Knowledge for Acqn M&S
26. M&S education & training
    - DAU, DAG & on-line CLMs
    - Conferences, workshops & assist visits
27. MSIAC utility

5 Acquisition M&S Objectives; 27 Actions
(14 actions broader than acquisition)

Objective 1	Objective 2	Objective 3	Objective 4	Objective 5
Provide necessary policy and guidance	**Enhance the technical framework for M&S**	**Improve model and simulation capabilities**	**Improve model and simulation use**	**Shape the workforce**

Objective 1 — Actions

1. **M&S management**
2. Model-based systems engineering & collaborative environments
3. M&S in testing
4. M&S planning documentation
5. RFP & contract language
6. **Security certification**

Objective 2 — Actions

7. Product development metamodel
8. Commercial SE standards
9. **Distributed simulation standards**
10. DoDAF utility
 - DoDAF 2.0 Acqn Overlay
 - Standards for depiction & interchange
11. **Metadata template for reusable resources**

Objective 3 — Actions

12. **Acquisition inputs to DoD M&S priorities**
13. **Best practices for model/sim development**
14. Distributed LVC environments
 - **Standards**
 - **Sim/lab/range compliance**
 - **Event services**
15. Central funding of high-priority, broadly-needed models & sims
 - **Prioritized needs**
 - **Pilot projects**
 - **Expansion as warranted**

Objective 4 — Actions

16. Help defining M&S strategy
17. M&S planning & employment best practices
18. **Foster reuse**
 - **Business model**
 - **Responsibilities**
 - **Resource discovery**
19. **Info availability**
 - **Scenarios**
 - **Systems**
 - **Threats**
 - **Environment**
20. **VV&A**
 - **Documentation**
 - **Risk-based**
 - **Examination**
21. COTS SE tools
22. **M&S metrics**

Objective 5 — Actions

23. Definition of required M&S competencies
24. Harvesting of commercial M&S lessons
25. **Assemble Body of Knowledge for Acqn M&S**
26. M&S education & training
 - DAU, DAG & on-line CLMs
 - Conferences, workshops & assist visits
27. **MSIAC utility**

Key

Broader than Acquisition

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5 Acquisition M&S Objectives; 27 Actions
(10 actions applicable to T&E)

Objective 1	Objective 2	Objective 3	Objective 4	Objective 5
Provide necessary policy and guidance	**Enhance the technical framework for M&S**	**Improve model and simulation capabilities**	**Improve model and simulation use**	**Shape the workforce**

Actions

Objective 1

1. **M&S management**
2. **Model-based systems engineering & collaborative environments**
3. **M&S in testing**
4. **M&S planning documentation**
5. RFP & contract language
6. **Security certification**

Objective 2

7. Product development metamodel
8. Commercial SE standards
9. **Distributed simulation standards**
10. DoDAF utility
   - DoDAF 2.0 Acqn Overlay
   - Standards for depiction & interchange
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Objective 3

12. **Acquisition inputs to DoD M&S priorities**
13. **Best practices for model/sim development**
14. **Distributed LVC environments**
   - **Standards**
   - **Sim/lab/range compliance**
   - **Event services**
15. **Central funding of high-priority, broadly-needed models & sims**
   - **Prioritized needs**
   - **Pilot projects**
   - **Expansion as warranted**

Objective 4

16. Help defining M&S strategy
17. M&S planning & employment best practices
18. **Foster reuse**
   - **Business model**
   - **Responsibilities**
   - **Resource discovery**
19. **Info availability**
   - **Scenarios**
   - **Systems**
   - **Threats**
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   - **Documentation**
   - **Risk-based**
   - **Examination**
21. COTS SE tools
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Objective 5

23. Definition of required M&S competencies
24. Harvesting of commercial M&S lessons
25. **Assemble Body of Knowledge for Acqn M&S**
26. M&S education & training
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   - Conferences, workshops & assist visits
27. **MSIAC utility**

Key

Broader than Acquisition

T&E Special Interest

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Summary of Actions and Products of Interest to the T&E Community

❑ Establish policy and guidance:

➢ To require documented M&S planning as part of the:
- Systems Engineering Plan
- T&E Strategy and
- T&E Master Plan

➢ For security certification of M&S activities falling under multiple Designated Accreditation Authorities (DAA)

Products: Revised policy and guidance in DoDI 5000.2, 8500.2; DAG; & TEMP Planning Guidance

Summary of Actions and Products
of Interest to the T&E Community (cont.)

❑ Foster cost-effective VV&A
  ➢ Develop risk-based methodology and associated guidelines for VV&A expenditures
  ➢ Require DoD-wide standardized documentation of VV&A
  ➢ Examine a program's VV&A when M&S informs major acquisition decisions and unambiguously state the purpose, key assumptions and significant limitations of each model/simulation when results are presented.

  Products: Updated DoDI 5000.61; revised policy and guidance in DoDI 5000.2 & DAG; Guidance & training for oversight personnel

Summary of Actions and Products
of Interest to the T&E Community (cont.)

❑ Enable readily-available distributed live-virtual-constructive environments

➢ Examine opportunities to converge distributed simulation standards (HLA, DIS, TENA, …)

➢ Establish DoD-wide standards for distributed environments

➢ Foster compliance by candidate simulations, labs, and ranges

Products: A larger collection of simulations, labs, & ranges ready to be employed in distributed events

Summary of Actions and Products of Interest to the T&E Community (cont.)

❑ Educate and train the workforce to achieve required M&S competencies
  ➢ Provide M&S knowledge via an expanded set of DAU courses, the DAG, and on-line CLMs
  ➢ Provide VV&A training for oversight personnel

  Products:
  ➢ Expanded set of DAU courses
  ➢ Improved M&S guidance in the Defense Acquisition Guide
  ➢ On-line Continuous Learning Modules
    ▪ "M&S in SE"
    ▪ "M&S in T&E"

Current Status and Way Ahead

❑ Completed coordination of Draft Acquisition M&S Master Plan at both the working and senior levels

❑ Formal DoD coordination pending outcome of Department level M&S management deliberations

❑ Re-chartering the AMSWG with new responsibilities:
  ➢ Monitor and assist with AMSMP execution
  ➢ Define and implement a process to identify and prioritize M&S needs/projects that serve a broad set of acquisition users
  ➢ Advocate Acquisition M&S needs and recommendations at the DoD corporate level
  ➢ Assess the state of acquisition M&S, relevant new technology, and new M&S initiatives
  ➢ Interface with Industry to align DoD and Industry approaches for M&S

Questions / Discussion ?