Acquisition M&S Master Plan Progress Report
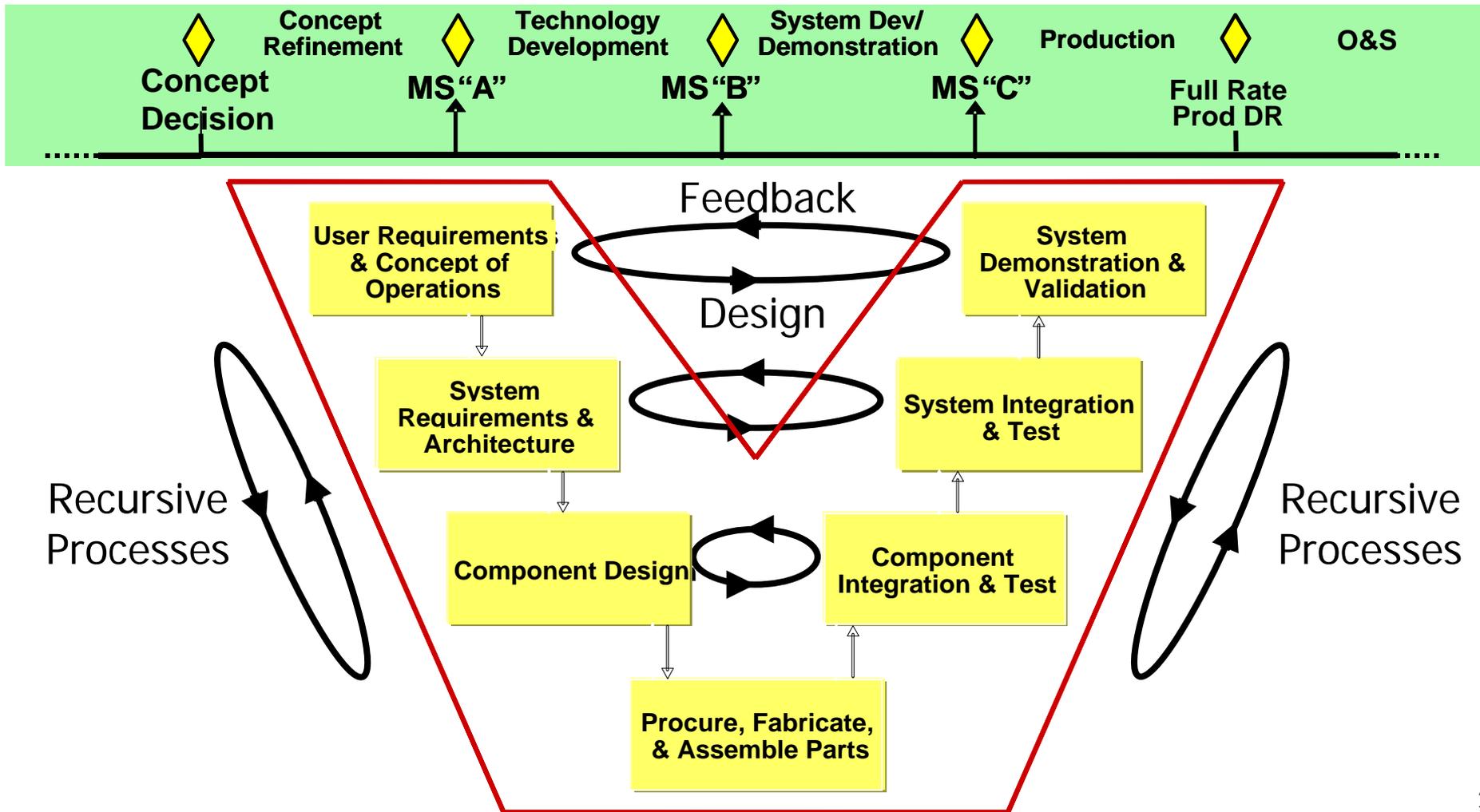
April 9, 2008

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Acquisition M&S

❑ Definition: M&S used to help define, develop, test, produce, operate, and sustain defense systems and systems-of-systems

❑ Scope: Across the acquisition life cycle

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Potential M&S Benefits

❑ M&S can improve design, integration, and evaluation

  ➢ Accurately track complex relationships, micro-level interactions

  ➢ Present macro-level measures of merit to decision makers

  ➢ Earlier, more accurate understanding of design, lowering risk

❑ If readily available, M&S can speed the design-evaluation cycle, saving time and cost

❑ Provides a more defendable analytical underpinning for decisions

❑ M&S surrogates for other systems and forces can cost-effectively flesh-out the battlespace for live tests

❑ Means to deal with the challenges of acquiring capabilities/systems of systems, with attendant dramatic increases in trade space and complexity

  ➢ Many more entities, variables, interactions, etc.

  ➢ Development enterprises become vast, distributed

  ➢ Many more stakeholders, with much at stake
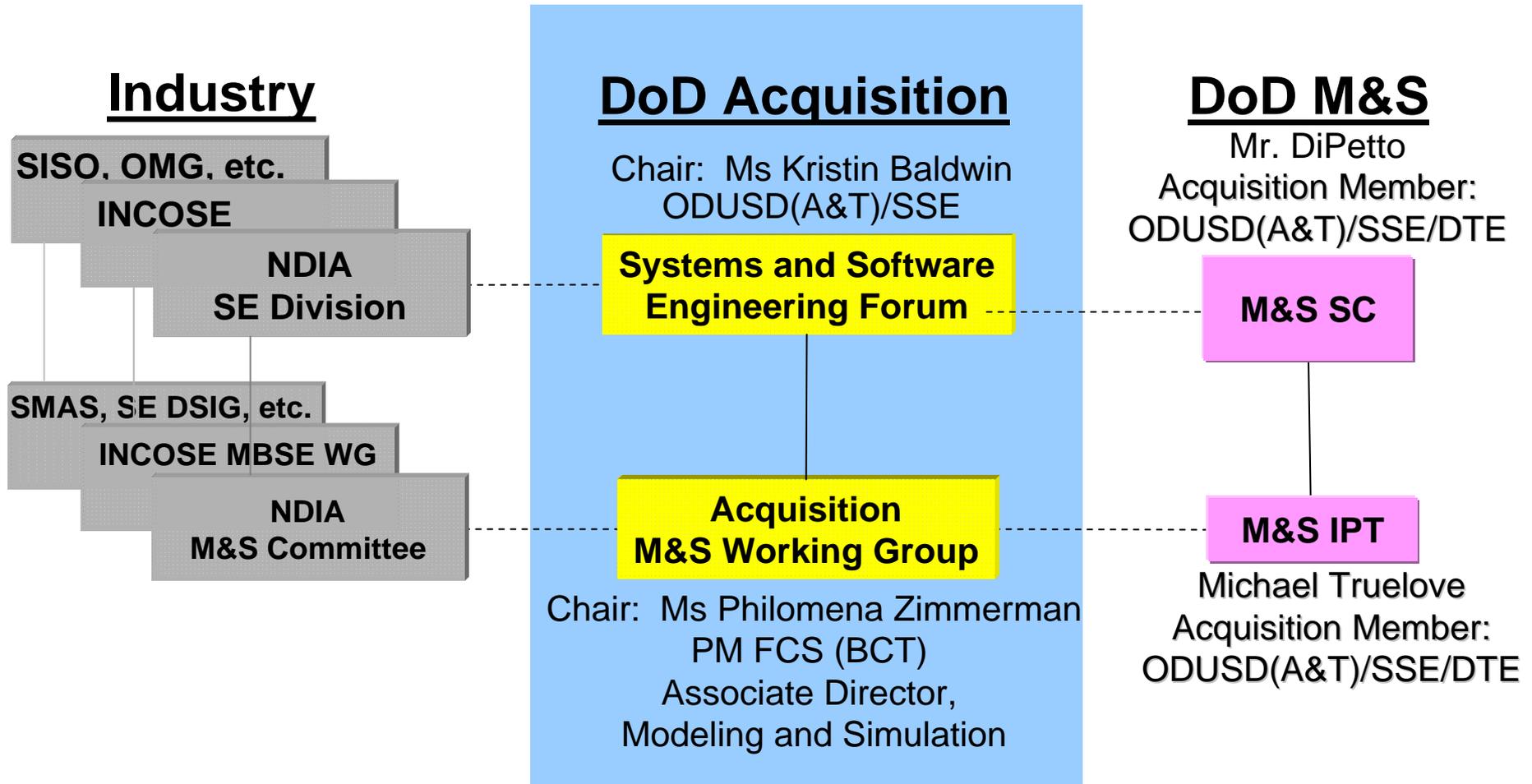
Acquisition Modeling & Simulation Master Plan

❏ **Purpose**

"Improve M&S support to the DoD acquisition process…"

❏ **Vision**

"Optimally employ responsive, trustworthy, and cost-effective M&S capabilities to support defining, developing, testing, producing and sustaining America's capabilities that support the spectrum of DoD missions."
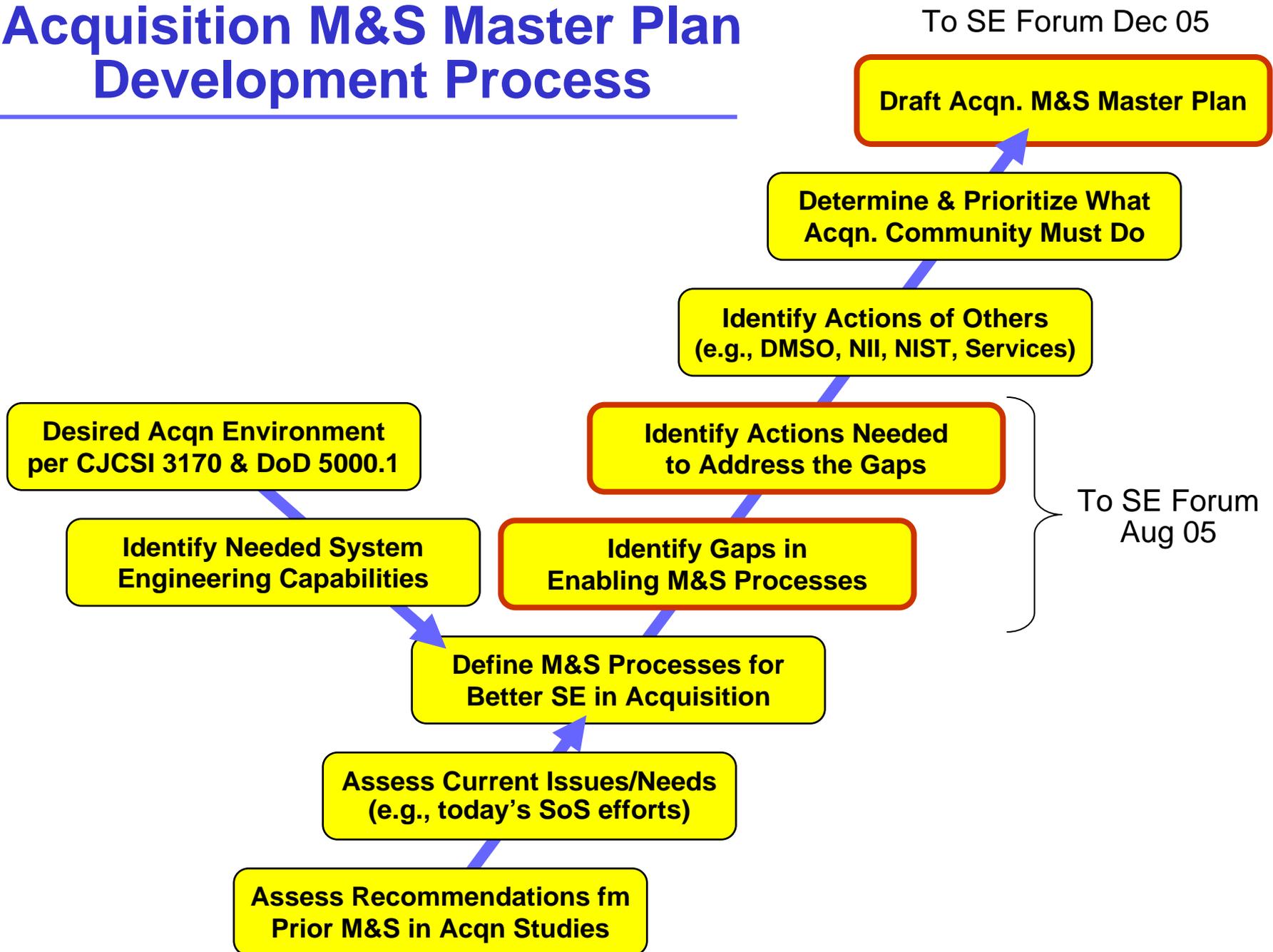
Governance Structure

Industry

- SISO, OMG, etc.
- INCOSE
- NDIA SE Division

- SMAS, SE DSIG, etc.
- INCOSE MBSE WG
- NDIA M&S Committee

DoD Acquisition

Chair: Ms Kristin Baldwin
ODUSD(A&T)/SSE

Systems and Software Engineering Forum

Acquisition M&S Working Group

Chair: Ms Philomena Zimmerman
PM FCS (BCT)
Associate Director,
Modeling and Simulation

DoD M&S

Mr. DiPetto
Acquisition Member:
ODUSD(A&T)/SSE/DTE

M&S SC

M&S IPT

Michael Truelove
Acquisition Member:
ODUSD(A&T)/SSE/DTE

AMSWG is anchored in acquisition community and linked to industry and the M&S community

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Approach

❑ Foster widely-needed M&S capabilities that are beyond the reach of individual programs

❑ Address M&S issues and actions necessary to enable acquisition of joint capabilities (systems of systems)

❑ Not try to do the job of program/capability managers; rather, seek to empower them

  ➢ By removing systemic obstacles in their path

  ➢ By identifying new options for approaching their tasks

❑ Lay out tasks as a Work Breakdown Structure (WBS)

  ➢ Discrete tasks with identified leads and explicit deliverables

  ➢ Easier to resource, schedule and manage

  ➢ Each contributes to better M&S support to acquisition

Acquisition M&S Master Plan Development Process

To SE Forum Dec 05

Draft Acqn. M&S Master Plan

Determine & Prioritize What Acqn. Community Must Do

Identify Actions of Others (e.g., DMSO, NII, NIST, Services)

Desired Acqn Environment per CJCSI 3170 & DoD 5000.1

Identify Actions Needed to Address the Gaps

To SE Forum Aug 05

Identify Needed System Engineering Capabilities

Identify Gaps in Enabling M&S Processes

Define M&S Processes for Better SE in Acquisition

Assess Current Issues/Needs (e.g., today's SoS efforts)

Assess Recommendations fm Prior M&S in Acqn Studies

Assessment Highlights

❑ Widespread use of M&S in acquisition, but usually stove-piped

❑ Many M&S representation gaps and deficiencies

❑ Acquisition staffs mostly uninformed about M&S capabilities and limitations

❑ No requirement to document planned M&S support to acquisition

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

❑ Weak contractual guidelines for M&S and data needs

❑ Lack of agreed standards for sharing info, interoperating M&S tools

❑ Hard to discover reusable M&S tools and data, insufficient info to evaluate reuse candidates, and lack of reuse incentives = little reuse

❑ Virtual ranges take too long to assemble; aren't kept readily available

❑ Validation often weak or non-existent; documentation and examination inconsistent

Acquisition M&S Master Plan Structure

Department of Defense

Acquisition Modeling and Simulation Master Plan

Issued by the

DoD Systems Engineering Forum

April 17, 2006

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- **Foreword**

- **Introduction**
  - **Purpose**
  - **Vision**
  - **Scope**

- **Objectives (5)**

- **Actions (40)**
  - **Action**
  - **Rationale** (why it's needed)
  - **Discussion** (implementation guidance)
  - **Lead & supporting organizations**
  - **Products** (what is expected)
  - **Completion goal (year)**

- **Execution Management**

http://www.acq.osd.mil/sse/as/guidance.html

Five Objectives, 40 Actions

Objective 1
Provide necessary policy and guidance

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

Key

Broader than Acqn

Partially broader

Objective 2
Enhance the technical framework for M&S

- **2-1 Product development metamodel**
- **2-2 Commercial SE standards**
- **2-3 Distributed simulation standards**
- **2-4 DoDAF utility**
  - a) DoDAF 2.0 Systems Engineering Overlay
  - b) Standards for depiction & interchange
- **2-5 Metadata template for reusable resources**

Objective 3
Improve model and simulation capabilities

- **3-1 Acquisition inputs to DoD M&S priorities**
- **3-2 Best practices for model/sim development**
- **3-3 Distributed LVC environments**
  - a) Standards
  - b) Sim/lab/range compliance
  - c) Event services
- **3-4 Central funding of high-priority, broadly-needed models & sims**
  - a) Prioritize needs
  - b) Pilot projects
  - c) Expansion as warranted

Objective 4
Improve model and simulation use

- **4-1 Help defining M&S strategy**
- **4-2 M&S planning & employment best practices**
- **4-3 Foster reuse**
  - a) Business model
  - b) Responsibilities
  - c) Resource discovery
- **4-4 Info availability**
  - a) Scenarios
  - b) Systems
  - c) Threats
  - d) Environment
- **4-5 VV&A**
  - a) Documentation
  - b) Risk-based
  - c) Examination
- **4-6 COTS SE tools**
- **4-7 M&S in acqn metrics**

Objective 5
Shape the workforce

- **5-1 Definition of required M&S competencies**
- **5-2 Harvesting of commercial M&S lessons**
- **5-3 Assemble Body of Knowledge for Acqn M&S**
- **5-4 M&S education & training**
  - a) DAU, DAG & on-line CLMs
  - b) Conferences, workshops & assist visits
- **5-5 MSIAC utility**

Progress Assessment

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

1-1 M&S management

1-2 Model-based systems engineering & collaborative environments

1-3 M&S in testing

1-4 M&S planning documentation

1-5 RFP & contract language

1-6 Security certification

Objective 2

2-1 Product development metamodel

2-2 Commercial SE standards

2-3 Distributed simulation standards

2-4 DoDAF utility

~~a) DoDAF 2.0 Systems Engineering Overlay~~

b) Standards for depiction & interchange

2-5 Metadata template for reusable resources

Objective 3

3-1 Acquisition inputs to DoD M&S priorities

3-2 Best practices for model/sim development

3-3 Distributed LVC environments
a) Standards
b) Sim/lab/range compliance
c) Event services

3-4 Central funding of high-priority, broadly-needed models & sims
a) Prioritize needs
b) Pilot projects
c) Expansion as warranted

Objective 4

4-1 Help defining M&S strategy

4-2 M&S planning & employment best practices

4-3 Foster reuse
a) Business model
b) Responsibilities
c) Resource discovery

4-4 Info availability
a) Scenarios
b) Systems
c) Threats
d) Environment

4-5 VV&A
a) Documentation
b) Risk-based
c) Examination

4-6 COTS SE tools

4-7 M&S in acqn metrics

Objective 5

5-1 Definition of required M&S competencies

5-2 Harvesting of commercial M&S lessons

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5-4 M&S education & training
a) DAU, DAG & on-line CLMs
b) Conferences, workshops & assist visits

5-5 MSIAC utility

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Objective 1: Provide Necessary Policy & Guidance

1-1. Provide effective, persistent DoD-wide M&S management to address cross-cutting M&S issues, coordinate actions

Lead: OUSD(AT&L) **Support:** OUSD(AT&L)/DS(SSE), OUSD(P&R), OUSD(C)/PA&E, etc.

Products: Revised DoDD 5000.59 (M&S Management), revised senior leadership management; and improved policies for M&S management. revised senior leadership management; and improved policies for M&S management.

Completion goal: 2006

- **Action completion is overdue (2006); dependent on broader consensus**
- **New DoD M&S management structure in place; effectiveness questioned**
- **New DoD Directive finally released Aug 07, with promise of a follow-on DoDI to define key responsibilities and processes. SOP now proposed as substitute.**
- **No acquisition community leadership role (Tri-chair) on M&S SC**
- **Current project selection process does not fund only cross-cutting efforts**

Next Steps:

- **Continue to argue for an SSE leadership role on M&S SC**
- **Work within M&S governance structure to realize a DoDI on M&S management**
- **Continue to propose an alternative approach to "C&CC Business Plan"**

Objective 1: Provide Necessary Policy & Guidance

1-2. Promote model-based systems engineering (MBSE) and M&S-enabled collaborative environments, at both the program and joint capability level

Lead: OUSD(AT&L)/DS(SSE); **Support:** Components
Products: Revised guidance in DAG
Completion goal: 2007

- **Action completion is overdue (2007)**
- **Current DAG mentions collaborative environments 14 times, simulation-based testing once, SBA twice, and MBSE not at all.**
- **Programs/companies often claim collaborative environments, but only partial**
- **MBSE a prominent part of INCOSE's SE Vision 2020**
- **Increasing industry use of MBSE concept & tools**
- **SSE submitted new DAG language May 07, but DAG revision stalled**

Next steps:

- **Continue advocacy for submitted DAG language; revise submittal if rejected**
- **Investigate possibility of a CLM on MBSE**

Objective 1: Provide Necessary Policy & Guidance

1-3. Establish policy and guidance on appropriate use of M&S to plan tests, to complement system live tests, and to evaluate joint capabilities

Co-leads: OUSD(AT&L)/DS, ODOT&E; **Support:** Components
Products: Revised policy and guidance in DoDI 5000.2 and DAG
Completion goal: 2007

- **Action completion overdue (unrealistically set as 2007)**
- **DoDI 5000.2 is excellent at the program level, but not at the capability level**
- **Improved planning discussion in latest DAG submission, but little specificity**
- **JMETC launched but many challenges ahead, including policy**
- **NDIA DT&E Cmte is coordinating development of industry recommendations for changes to T&E portions of DoDD 5000 series (& possibly CJCSI 3170.01)**

Next steps:

- **NDIA M&S Cmte participate in DT&E Cmte effort; check for progress**
- **Track JMETC policy development, respond appropriately**
- **Draft the policy and guidance in view, vet with the various stakeholders**
- **Submit additional changes to DAG (both T&E and M&S portions)**

Obj. 1: Provide Necessary Policy & Guidance (cont.)

1-4. Establish policy to require documented M&S planning at the joint capability & program levels as part of the Systems Engineering Plan, T&E Strategy and T&E Master Plan

Co-leads: OUSD(AT&L)/DS(SSE), ODOT&E; **Support:** Components

Products: Revised policy and guidance in DoDI 5000.2, DAG, and DOT&E TEMP Planning Guidance

Completion goal: 2007

- **Action completion is overdue (2007); mostly due to dependence on others**
- **AMSWG (SSE) submitted revised language to DoD 5000.2, DAG language and SEP Preparation Guide**
- **Partial acceptance of SEP language; DoDI 5000.2 and DAG updates stalled**
- **No action thus far regarding TEMP Plng Guidance**

Next steps:

- **Draft/submit language for TEMP Planning Guidance**

Obj. 1: Provide Necessary Policy & Guidance (cont.)

1-5. Establish M&S-related guidelines for solicitations, source selections, and contracting.

> **Lead:** OUSD(AT&L)/DS(SSE); **Support:** OUSD(AT&L)/DPAP, ODOT&E, Components
>
> **Products:** Sample language in DoD publications (e.g., DAG, SEP Preparation Guide, Contracting for Systems Engineering Guidebook) regarding M&S requirements, data rights, and the responsibilities and liabilities of parties regarding sharing and reuse
>
> **Completion goal:** 2007

- **Action completion is overdue (2007) due to M&S Cell workload**
- **Solicited inputs from AMSWG members and industry (through NDIA M&S Cmte)**
- **AMSWG (SSE) submitted DAG language regarding source-selection criteria**
- **Presentation at Oct 07 NDIA Systems Engineering Conference**

Next steps:
- **Further refinement and vetting of proposed guidance**
- **Synthesize best language & submit to DAG (update), SEP Preparation Guide, and Contracting for Systems Engineering Guidebook**

Obj. 1: Provide Necessary Policy & Guidance (cont.)

1-6. Ensure practical guidelines for information assurance certification and accreditation of M&S federated networks falling under multiple Designated Accreditation Authorities (DAAs)

Lead: OASD(NII); **Support:** OUSD(AT&L)/DS(SSE), OUSD(I), NSA

Products: Proven, practical guidelines published in DAG and DoD 8500.2-H, per DoDI 8500.2 "Information Assurance Implementation," Feb 6, 2003

Completion goal: 2007

- **Action completion overdue (2007)**
- **NII has published DoDI 8500.2, but AMSWG questions adequacy**
- **AMSWG-NII discussions held in 2007; NAVAIR procedures identified as a candidate to provide the additional specificity needed**
- **Awaiting delivery of NAVAIR procedures for (a) NII evaluation of compliance with 8500.2. (b) NII evaluation of suitability for revising 8500.2, and (c) AMSWG assessment of suitability for inclusion in DAG**

Next steps:

- **Follow-up with NAVAIR to ensure submission of their procedures**
- **Conduct the three evaluations mentioned above**
- **Draft, vet, and submit DAG language**

Objective 2: Enhance the Technical Framework for M&S

2-1. Develop a product development information metamodel & associated metadata extensions to the DoD Discovery Metadata Specification

Lead: OUSD(AT&L)/DS(SSE); **Support:** OASD(NII), Components
Products: Revised DDMS; revised guidance in DAG.
Completion goal: 2008

- JSF has developed a metamodel specification and provided it to M&S CO
- The M&S CO M&S COI Discovery Metadata project will address anything beyond discovery metadata
- We requested, and M&S CO provided, Scrudder assistance to work with JSF to evolve its metamodel
- Working group met in Ft. Worth Jan 08, decided key issues, is still at work

Next steps:

- Cooperate with JSF as it completes a revised metadata specification
- Coordinate with M&S CO to vet more broadly (likely PA&E interest) and make this a DoD or (preferably) commercial standard

Objective 2: Enhance the Technical Framework for M&S

2-2. Support development of open commercial and non-proprietary standards for systems engineering (MBSE), such as OMG's Systems Modeling Language (SysML) and ISO Standard 10303 AP-233

> **Co-leads:** OUSD(AT&L)/DS(SSE); DoD CIO **Support:** OASD(NII), DLA, OUSD(AT&L), **Products:** Standards suitable for use by DoD
> **Completion goal:** 2007

- Action is complete for SysML and AP-233, but DoD awareness is lacking
- SysML v1.0 issued as an "available standard;" v 1.1 minor revision late 2008
- Increasing usage & teaching of SysML; major subject at INCOSE, NDIA
- Navy M&S Standards Steering Group has proposed SysML as a standard
- AP-233 SE data interchange standards being released incrementally
- COTS System Engineering tools are incorporating SysML and AP-233
- Nothing yet submitted to DoD Standardization Program and DISR

Next steps:

- Track SysML and AP-233 implementations, publicize results
- Investigate DoD Standardization Program process; submit SysML and AP-233
- Identify any needs for additional standards

Objective 2: Enhance the Technical Framework for M&S

2-3. Establish a forum to clarify the characteristics and application of various distributed simulation standards (ALSP, DIS, HLA, SI3, TENA, etc.) and examine opportunities for convergence

Lead: OUSD(AT&L) **Support:** OUSD(AT&L)/TRMC & DS(SSE), ODOT&E, Components

Products: (1) Information on strengths & weaknesses of the various standards; (2) agreement on policy and/or guidance on the use of distributed simulation standards; (3) a way ahead regarding distributed simulation standards

➢ **Completion goal:** 2007

- **Action (Establish a forum) completed in (2007, but products not yet available**
- **M&S SC-funded LVC Architecture Roadmap due out late 2008**
- **SE Forum is interested, has taken one briefing**
- **M&S Cell (Hollenbach) participating in this project, tracking progress and coordinating related M&S SC actions (HLA Way Ahead)**

Next steps:

- **Continue to participate; await final report and M&S SC response**

Obj. 2: Enhance the Technical Framework for M&S (cont.)

2-4. Improve the utility of the DoD Architecture Framework (DoDAF) for acquisition

2-4(a) Develop Systems Engineering Overlay (profile) for DoDAF v2.0
Lead: OUSD(AT&L)/DS; **Support:** OASD(NII), Components
Products: Acquisition Overlay for DoDAF v2.0
Completion goal: 2006

2-4(b) Support development of open commercial standards for the depiction and interchange of DoDAF-compliant architectures
Lead: OASD(NII) **Support:** OUSD(AT&L)/DS(SSE)
Products: Published standards suitable for adoption by DoD in DoDAF 2.0; revised guidance in DAG
Completion goal: 2007

- **2-4(a): Overlay concept has been dropped, so this action is OBE**
- **2-4(b): OMG's UPDM (UML Profile for DoDAF/MODAF) nearly finalized**
- **SE Forum beginning to appreciate the value of DoDAF**
- **ASD(NII) is attempting to make DoDAF v2.0 more useful for acquisition**
- **Acquisition Community participation in DoDAF WG curtailed; unsure of latest DoD position regarding UPDM**

Next steps:

- **Increase involvement in DoDAF WG, support us of UPDM and other commercial standards for architecture data exchange**

Obj. 2: Enhance the Technical Framework for M&S (cont.)

2-5. Establish a standard template of key characteristics (metadata) to describe (discover) reusable M&S resources

    Lead: OUSD(AT&L) **Support:** OUSD(AT&L)/DS(SSE) & TRMC, OASD(NII), ODOT&E, Components

    Products: Published standard template; usage guidance in DAG

    Completion goal: 2007

- M&S CO M&S COI Discovery Metadata project addressing this
- M&S Call has coordinated with M&S CO to ensure no cross-threads with Action 2-1 (Product Development Metadata Specification)
- Version 1.0 published, being evaluated by users (e.g., MSRR, JDS, JRSG) who are providing feedback to refine it
- Suggested M&S CO also investigate OMG's Reusable Asset Specification

Next steps:

- Draft, vet and submit DAG entry based on final product

Objective 3: Improve Model & Simulation Capabilities

3-1. Establish a process to ensure acquisition needs are reflected in DoD M&S priorities

Lead: OUSD(AT&L) **Support:** OUSD(AT&L)/DS(SSE), ODOT&E, DOD CIO, Components

Products: A method to capture and prioritize acquisition needs.

Completion goal: 2007

- **Action completion is overdue (2007)**
- **AMSWG has successfully obtained M&S SC funding for several projects**
- **AMSWG has started an effort to pursue SBIR opportunities**
- **AMSWG till does not have an effective voice in other venues that affect M&S capability, such as other S&T and DARPA**

Next steps:
- **Continue to pursue M&S SC and SBIR funding opportunities**
- **Investigate DoD S&T planning process to identify entry points**
- **Build list of acquisition M&S S&T needs**

Objective 3: Improve Model & Simulation Capabilities

3-2. Define and foster best practices for efficient development and evolution of credible M&S tools, incorporating user-defined requirements, a systems engineering approach, and appropriate verification & validation

Lead: OUSD(AT&L); **Support:** OUSD(AT&L)/DS(SSE), ODOT&E, DOD CIO, Components

Products: Best practices publication, available via MSIAC, DTIC, etc.; DAG guidance to use

Completion goal: 2008

- **No significant effort thus far**

- **Expect some insights from other best practices solicitation (Action 4-2)**

Next steps:

- **Submit as a SBIR candidate**

- **Alternate: Cooperative AMSWG effort to conduct literature search and synthesize best practice**

Obj 3: Improve Model & Simulation Capabilities (cont.)

3-3. Enable readily-available distributed live-virtual-constructive environments, leveraging related initiatives

3-3(a) Establish DoD-wide standards for distributed environments
Lead: OUSD(AT&L); **Support:** OUSD(AT&L)/TRMC & DS(SSE); ODOT&E; DOD CIO, Components
Products: Published standard; DODI (# TBD) policy to use
Completion goal: 2008

3-3(b) Make candidate simulations, labs and ranges compliant with these standards
Lead: Components; **Support:** OUSD(AT&L)/DS(SSE) & TRMC, ODOT&E
Products: A larger collection of simulations, labs, and ranges ready to be employed in distributed events
Completion goal: 2010

3-3(c) Ensure availability of services to help plan and conduct events
Lead: Components; **Support:** OUSD(AT&L), OUSD(AT&L)/TRMC, DISA
Products: Fee-based technical services to help users (e.g., PMs, Capability Managers, OTAs) plan and conduct distributed events
Completion goal: 2009

- **LVC Architecture Roadmap project underway**
- **Nothing begun on other standards (object models, data exchange, etc.), but LVCAR will likely address a path forward on this**

Next steps:
- **Investigate use of SysML in Federation Development and Execution Process (FEDEP). (TEAMS paper at Spring 2008 SIW.)**
- **Await LVC Architecture Roadmap**

Obj 3: Improve Model & Simulation Capabilities (cont.)

3-4. Centrally fund and manage the development of high-priority, broadly-needed M&S tools

   3-4(a) Identify and prioritize broadly-needed M&S tools

      Lead: OUSD(AT&L); **Support:** OUSD(AT&L)/DS(SSE); ODOT&E, DOD CIO, Components

      Products: Prioritized list of common M&S tool needs

      Completion goal: 2007

   3-4(b) Conduct one or more pilot projects to develop new M&S tools or update existing ones to meet these needs

      Lead: OUSD(AT&L); **Support:** OUSD(AT&L)/DS(SSE), Components

      Products: Proof of concept for managing the development/evolution of M&S tools to meet broadly-shared needs

      Completion goal: 2008

   3-4(c) Expand the scope of central M&S tool management as warranted by pilot project results and the list of common M&S needs

      Lead: OUSD(AT&L); **Support:** OUSD(AT&L)/DS(SSE), ODOT&E, Components

      Products: Capability to provide broadly-needed M&S tools in a more responsive and cost-effective way.

      Completion goal: 2011

- **AMSWG submitted 3-4(b) pilot proposal, but it didn't make the cut**

Next steps:

- **Investigate extant cooperative efforts beyond Joint Acft. Surv. Prgm.**
- **Submit a revised proposal for FY09 M&S SC funding**

Objective 4: Improve Model & Simulation Use

4-1. Provide potential acquisition M&S users the knowledge needed to formulate an effective M&S strategy via ready access to M&S expertise and information about M&S capabilities and gaps, reusable resources, lessons-learned, etc.

Lead: OUSD(AT&L);   **Support:** OUSD(AT&L)/DS(SSE)

Products: Revised guidance in DAG; improved knowledge base in MSIAC; assist visits (e.g., by OUSD(AT&L)/DS(SSE)

Completion goal: 2008

- **Revised guidance submitted to DAG**
- **SSE M&S Cell assisting as able, but not widely advertised**
- **No other Components offering assistance**
- **5-1 Education project Identified many M&S Bodies of Knowledge that may offer useful information**

Next steps:

- **Advertise and expand assist visits. SSE has made this a 2008 priority.**
- **Based on our experience, promote similar efforts by other Components**
- **Improve MSIAC expertise regarding M&S in acquisition (Action 5-5)**

Objective 4: Improve Model & Simulation Use

4-2. Define and disseminate best practices for disciplined M&S planning & employment

Lead: OUSD(AT&L)/DS(SSE), **Support:** OUSD(AT&L), Components
Product: Revised best practices guidance in DAG and MSIAC
Completion goal: 2007

- **Action completion is overdue (2007) because Hollenbach's a slacker**
- **High-level discussion included in "M&S for Systems Engineering" CLM**
- **Expanded discussion submitted in recent DAG revision**
- **M&S Planning and Employment Best Practices solicitation completed in April 07**

Next steps:

- **Synthesize best practice, conduct AMSWG & NDIA reviews**

Obj. 4: Improve Model & Simulation Use (cont.)

4-3. Facilitate the sharing of reusable resources

4-3(a) Establish a DoD-wide business model for compensating providers of reusable M&S resources (e.g., information, software, services)

Lead: OUSD(AT&L); **Support:** OUSD(AT&L)/DS(SSE), OUSD(P&R), OUSD(C)/PA&E, Components

Product: Documented business model; revised policy and/or guidance in DoD 5000 series & DAG

Completion goal: 2007

- **M&S SC-funded M&S Resource Reuse Business Model study underway, will report out late 2008**

Next steps:

- **No further action needed yet; awaiting project outcome**
- **LVC Architecture Roadmap may have an impact**

Obj. 4: Improve Model & Simulation Use (cont.)

4-3. Facilitate the sharing of reusable resources

4-3(b) Establish DoD policy and/or guidance regarding responsibilities to share, protect and properly use M&S information, tools, and data

Co-Leads: OASD(NII), OUSD(AT&L), USD(I); **Support:** OUSD(AT&L)/DS(SSE) & DPAP, OUSD(P&R), OUSD(C)/PA&E, Components

Product: Revised policy and/or guidance in various issuances (e.g., DoD 5000 series, DAG, contracting guidance)

Completion goal: 2008

- **Drafted and submitted DAG language**

- **M&S Resource Reuse Business Model project may make recommendations on this subject**

Next steps:

- **Receive Business Model study report**

- **Draft language for contracting guide**

- **(Hold-off submitting a 5000 change)**

Obj. 4: Improve Model & Simulation Use (cont.)

4-3. Facilitate the sharing of reusable resources

4-3(c) Enhance the means (e.g., directory service, registries, bulletin boards) to discover the existence of reusable resources required for M&S and contact information

Lead: OUSD(AT&L) **Support:** OUSD(AT&L)/DS(SSE), OUSD(P&R), OUSD(C)/PA&E, Components

Product: A better way to discover reusable resources. Re-orientation and integration of various DoD M&S resources repositories.

Completion goal: 2007

- **DDR&E has directed M&S CO to develop a "reliable repository"; project is proceeding**
- **We see a viable business model as a prerequisite**

Next steps:
- **Track M&S CO project (renamed M&S Catalog); support as able**

4-4. Define the types of information DoD organizations shall make available to others with a clearance and valid need to know and the processes to obtain them (per reuse business model). The process to obtain information should include an efficient mechanism for industry to request government data with specific "need to know" outside a specific contract environment.

4-4(a) Scenario data
Lead: OUSD(AT&L) **Support:** OCJCS(J8), OUSD(C)/PA&E, DIA, Components
Product: Approved scenarios and process to obtain
Completion goal: 2007

4-4(b) System-related data
Lead: OUSD(AT&L)/DS(SSE); **Support:** ODOT&E, Components
Product: Process to obtain authoritative system data (characteristics and performance, interactions, interfaces, logistic support, etc.) documented in the DAG and appropriate OASD (NII) policy documents.
Completion goal: 2008

4-4(c) Threat data
Lead: DIA; **Support:** OUSD(AT&L); OUSD(AT&L)/DS(SSE), ODOT&E, and Components
Product: Authoritative threat data and process to obtain
Completion goal: 2007

4-4(d) Natural environment data
Lead: DoD Natural Environment MSEAs (MSCAs); **Support:** OUSD(AT&L), OUSD(AT&L)/DS(SSE), Components
Product: Authoritative natural environment data and process to obtain
Completion goal: 2007

Action 4-4 Assessment

- Acquisition Support Division of DIA has briefed AMSWG and NDIA M&S Cmte on its support to acquisition programs
- MSIC has briefed NDIA M&S Cmte on TMAP program and provided instructions on how to request TMAP models
- Draft DAG language discusses threat data sources and traceability
- No method exists "for industry to request government data with specific 'need to know' outside a specific contract environment"
- M&S SC-funded Environmental Scenario Generator project underway
- No progress regarding sharing U.S. system data
- Joint Rapid Scenario Generation (JRSG) and Joint Data Alternatives (JDA) projects advertise they will address all the Action 4-4 info needs; time will tell

Next steps:

- Monitor JRSG and JDA projects as resources permit
- Investigate data sharing polices of OSD, JCS, and other Components
- Investigate JSC, PAE, & Service scenario data availability & access
- Draft add'l DAG language on all data types (interim prior to JRSG /JDA)
- Continue to build on Nov 07 PA&E-Boeing-NDIA M&S Cmte discussion

Obj. 4: Improve Model & Simulation Use (cont.)

4-5. Foster cost-effective VV&A

4-5(a) Require DoD-wide standardized documentation of VV&A

Lead: OUSD(AT&L); **Support:** OUSD(AT&L)/DS(SSE), ODOT&E, Components

Products: Revised policy in DODI 5000.2 and 5000.61; revised guidance in DAG

Completion goal: 2007

- AMSWG-sponsored, M&S CO-funded project underway
- Documentation has been established as a MILSPEC 3022; commercial (SISO) standard to follow
- Tool to manage documentation is in beta testing
- AMSWG concern that draft M&S SC's "DoD M&S Strategic Vision" call for "practical verification, validation, and accreditation guidelines that vary by application area" (emphasis added) will undermine VV&A.

Next steps:

- Publicize standard and supporting tool
- Actively participate in DoDI 5000.61 update to incorporate this standard and maintain a unified DoD policy

Obj. 4: Improve Model & Simulation Use (cont.)

4-5. Foster cost-effective VV&A

4-5(b) Develop risk-based methodology and associated guidelines for VV&A expenditures

Lead: OUSD(AT&L); **Support:** OUSD(AT&L)/DS(SSE), Components
Products: Updated DoDI 5000.61; revised policy and guidance in DoDI 5000.2 and DAG
Completion goal: 2007

- **Action completion is overdue (2007)**

- **M&S CO project underway, with promise it will address this issue**

Next steps:

- **Obtain update on M&S CO progress developing risk-based VV&A guidelines, support and take action as necessary**

4-5. Foster cost-effective VV&A

4-5(c) 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.

Lead: OUSD(AT&L)/DS(SSE)   **Support:** DoD Components
Products: Guidance & training for oversight personnel; updates to DAG Chaps 4, 9
Completion goal: 2007

- **Submitted DAG language on VV&A examination**
- **SSE M&S Cell has given initial briefing to OUSD(A&T)/SSE/AS**
- **No other Component activities underway**
- **Action completion is overdue (2007)**

Next steps:

- **Broaden teaching on VV&A examination**
- **M&S Cell support SSE/AS to do this during OSD program reviews**
- **Other AMSWG members take action within their Components**

Obj. 4: Improve Model & Simulation Use (cont.)

4-6. Assess the use of COTS systems engineering tools (modeling environments) for collaborative architecture development

Lead: OUSD(AT&L)/DS(SSE); **Support:** OASD(NII), Components
Products: Revised guidance in DAG; enhanced M&S body of knowledge for dissemination
Completion goal: 2007

- **Action completion is overdue (2007); no inter-program use of COTS tools for architecture development thus far**

- **SysML and AP-233 already proving utility in COTS tools (market success)**

- **UPDM nearing finalization, can help with CADM AND DARS weaknesses**

- **NIST "Systems Engineering Tool Interoperability Plug-fest" underway**

Next steps:

- **Investigate use of SE tools for collaborative architecture development**

- **SBIR candidate?**

4-7. Define and capture meaningful metrics for M&S utility in acquisition

    Co-Leads: OUSD(AT&L), Dept. of the Navy **Support:** OUSD(AT&L)/DS(SSE), Components

    Products: Metric definitions in DAG; methods to capture and submit data in DAG; data from individual projects in MSIAC, Body of Knowledge, etc.

    Completion goal: 2007

- **Action completion is overdue (2007)**
- **One of the top 5 acquisition M&S projects for M&S SC FY08 funding, but didn't make the cut**

Next steps:

- **Resubmit as an FY09 M&S SC project**

Objective 5: Shape the Workforce

5-1. Define required M&S competencies for the acquisition workforce

Co-Leads: DAU and OUSD(AT&L)/DS(SSE); **Support:** OUSD(P&R),
OUSD(AT&L)/DDRE, OUSD(C)/PA&E, Components

Product: Identified lead FIPT; workforce qualification requirements; management
process & structure

Completion goal: 2008

- **"Educating the M&S Workforce" project underway with Navy and FY07 M&S SC funding**

- **FY08 funding increment approved by M&S SC; Analysis Co-Chair "hold" recently overcome**

Next steps:

- **Receive final deliverables**

- **Support implementation as appropriate and feasible**

Objective 5: Shape the Workforce

5-2. Harvest lessons from commercial sector activities in the use of M&S to support product development

Lead: OUSD(AT&L)/DS(SSE);   **Support:** OUSD(AT&L), Components

Products: Annual update to best practices in DAG and lessons from industry that should be considered by PMs in planning for M&S

Completion goal: Recurring; initial in 2007

- SSE participating in conferences, workshops, and literature review involving commercial industry use of M&S, capturing relevant points
- Increasing industry adoption of "Simulation-Based Design (SBD)"
- Action complete, but follow-on expansion needed

Next steps:

- Collect and consolidate findings, feed into Action 5-3 BoK
- SBIR candidate?

Objective 5: Shape the Workforce

5-3. Assemble and evolve the M&S Body of Knowledge (information set) relevant to acquisition

Lead: OUSD(AT&L); **Support:** OUSD(AT&L)/DS(SSE), Components
Product: Information base available to potential M&S users (e.g., PMs, CMs, OTAs); source material for education and training
Completion goal: Recurring; initial in 2006

- **Action completed in 2007 as part of ongoing education project**

- **Several BoKs have been discovered**

- **Education project has synthesized a consolidated BoK**

- **Knowledge is still being developed (e.g., best practices)**

Next steps:

- **Establish an effective Configuration Management process**

- **Make additional inputs as they are discovered or become available**

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Obj. 5: Shape the Workforce (cont.)

5-4. Educate and train the workforce to achieve required M&S competencies

5-4(a) Provide M&S knowledge via an expanded set of DAU courses, the Defense Acquisition Guide, and on-line CLMs

Lead: DAU; **Support:** OUSD(AT&L), OUSD(AT&L)/DS(SSE), Components
Product: Expanded set of DAU courses, improved M&S guidance in the Defense Acquisition Guide, on line Continuous Learning Modules; a better educated workforce
Completion goal: 2009

- CLM on "M&S for Systems Engineering" released, has >3900 graduates
- CLM on "M&S for Test & Evaluation" released, has >1600 graduates
- DAG inputs provided; awaiting publication. Will be enhanced as information is defined
- No change to DAU courses so far, but education project will be a catalyst

Next steps:

- Implement additional CLMs (Education Project expects to recommend ~10) as feasible

Obj. 5: Shape the Workforce (cont.)

5-4. Educate and train the workforce to achieve required M&S
      competencies

5-4(b) Provide M&S knowledge via conferences, workshops, and
        assist visits

Lead: OUSD(AT&L)/DS(SSE); **Support:** OUSD(AT&L), DAU, Components
Product: Annual outreach program; a better educated and trained workforce
Completion goal: Recurring; initial in 2006

- **Initial Outreach Plan approved by AMSWG; includes M&S tutorial for AS staff, DMSC, NDIA, and SISO presentations**

- **Add'l materials (e.g., best practices) in work**

- **Resource constrained**

Next steps:

- **Advertise and expand assist visits; SSE has made this a 2008 priority**

- **Hold workshops once recommended practices are in hand**

5-5. Improve the knowledge and expertise available through the MSIAC to make it of greater utility to the acquisition community

Lead: OUSD(AT&L); **Support:** OUSD(AT&L)/DS(SSE), OUSD(P&R), OUSD(C)/PA&E, Components

Product: Plan of action with coordinated MSIAC CONOPS & staffing requirement; list of knowledge shortfalls that MSIAC will take on; success criteria & process to bring MSIAC up to criteria

Completion goal: 2008

- **Only preliminary conversations with MSIAC contractor thus far**

- **No plan of action by MSIAC; they want us to tell them what to do**

Next steps:

- **Develop a plan of action to improve the M&S Information Analysis Center's usefulness to the acquisition community**

Discussion