

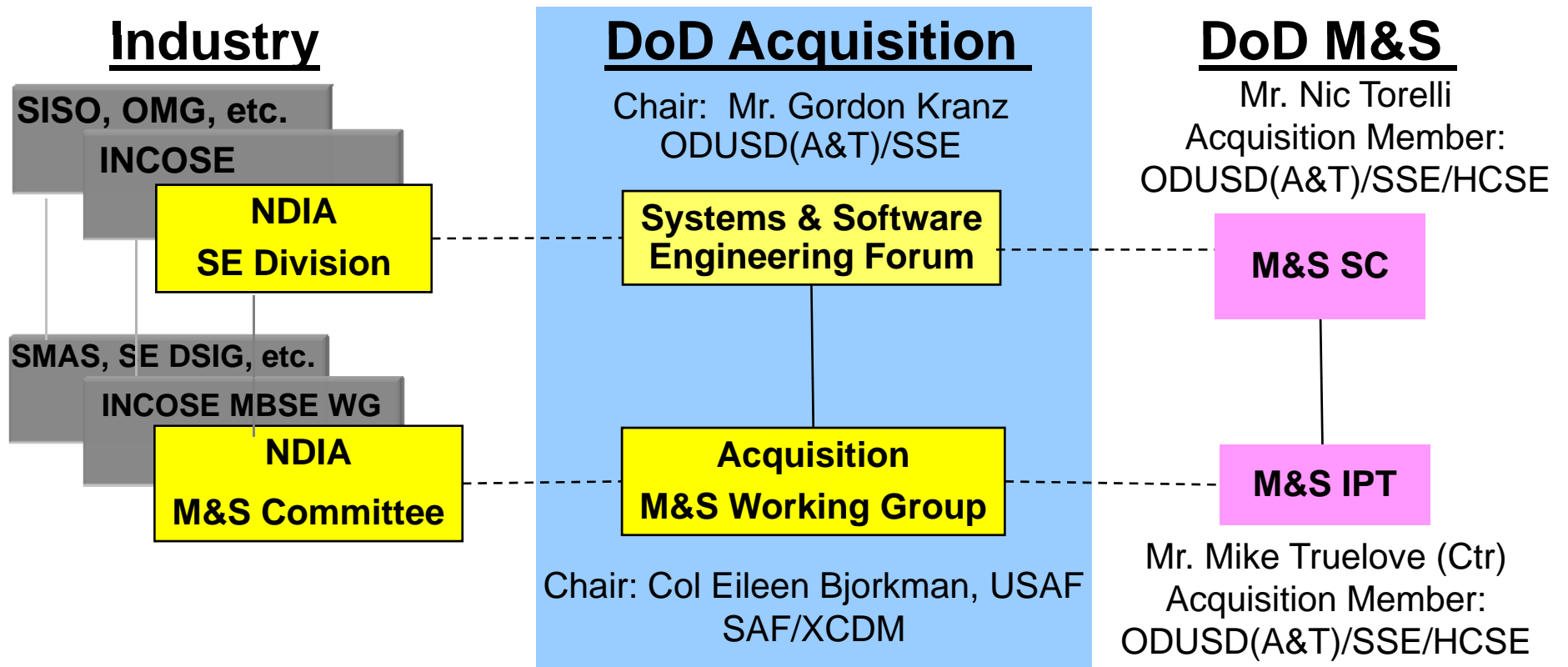
Execution of the Acquisition M&S Master Plan Progress Report



NDIA Systems Engineering M&S Committee Meeting
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Acqn M&S Working Group Relationships



AMSWG Charter (SE Forum, 2006)

- ❑ Assist PMs and acquisition professionals by improving the utility of M&S . . .
- ❑ Address common concerns, improve info flow, align technical initiatives, pursue cross-cutting issue resolution . . .
- ❑ Represent the acquisition community in DoD M&S deliberations . . .

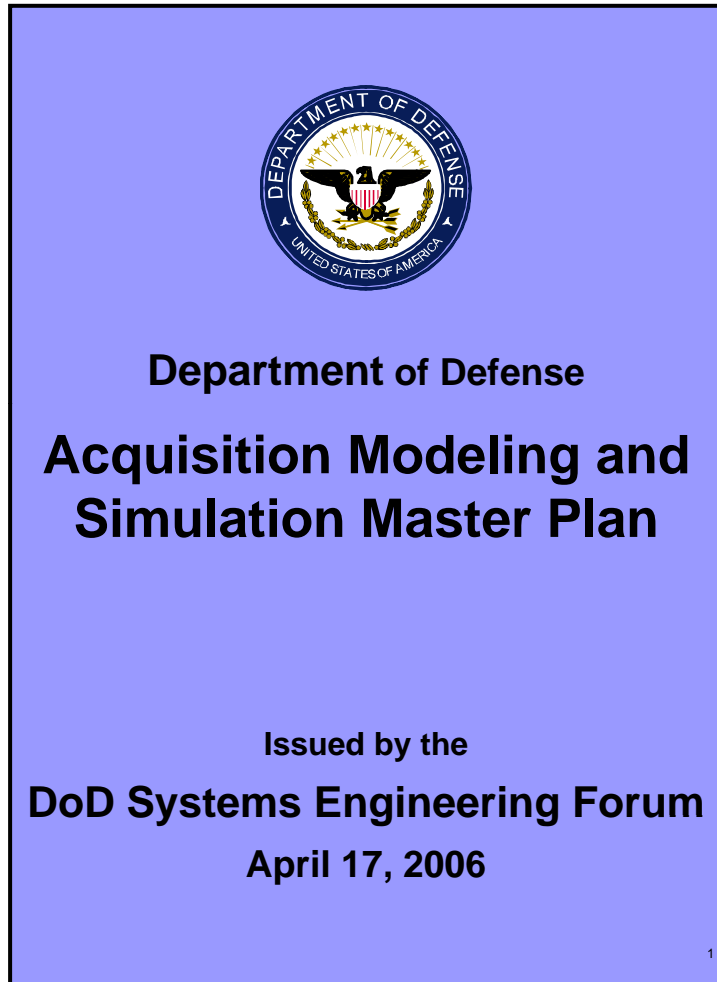
Why Care About M&S?

- ❑ To master complexity: M&S tracks the details, presents measures of merit, and identifies issues
 - *Increasingly important with complex systems and SoS*
- ❑ To design faster & better → build models (sys eng, arch., CAD, S/W, . . .)
- ❑ M&S can rapidly assess design merits; speed design-evaluation cycle
 - *Earlier, more accurate insights, reducing risk and cost*
- ❑ Simulation augmentation provides more realistic T&E environments
- ❑ M&S allows assessments when live operations are precluded by:
 - *Security, safety, battlespace constraints, paucity of live assets, or cost*
- ❑ Good modeling & simulation must follow a systems engineering process
- ❑ M&S can foster a shared understanding across vast enterprises
- ❑ Credible M&S provides a defensible analytical underpinning for decisions
- ❑ For above reasons, systems engineering is increasingly model-based

Summary: M&S can help cost, risk, performance, and schedule!

But there are many obstacles to maximizing these M&S benefits

Acquisition M&S Master Plan



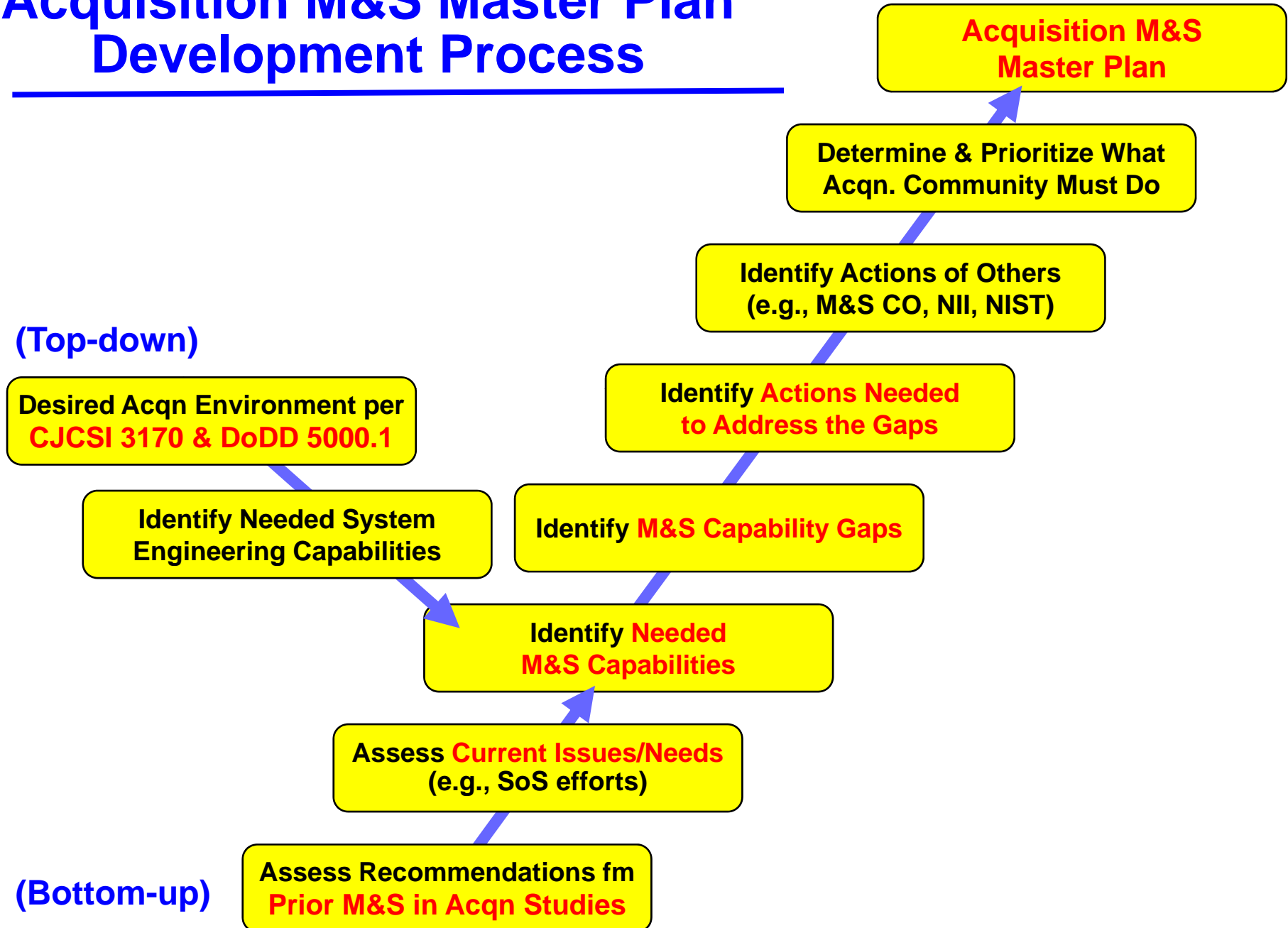
- Foreword
- Introduction
 - Purpose
 - Vision
 - Scope
- Objectives (5)
- Actions (40)
 - Action
 - Rationale (why it's needed)
 - Discussion (implementation guidance)
 - Lead & supporting organizations
 - Products (what is expected)
 - Completion goal (year)
- Execution Management

http://www.acq.osd.mil/sse/dte/initiat_ms.html

AMSMP Strategy

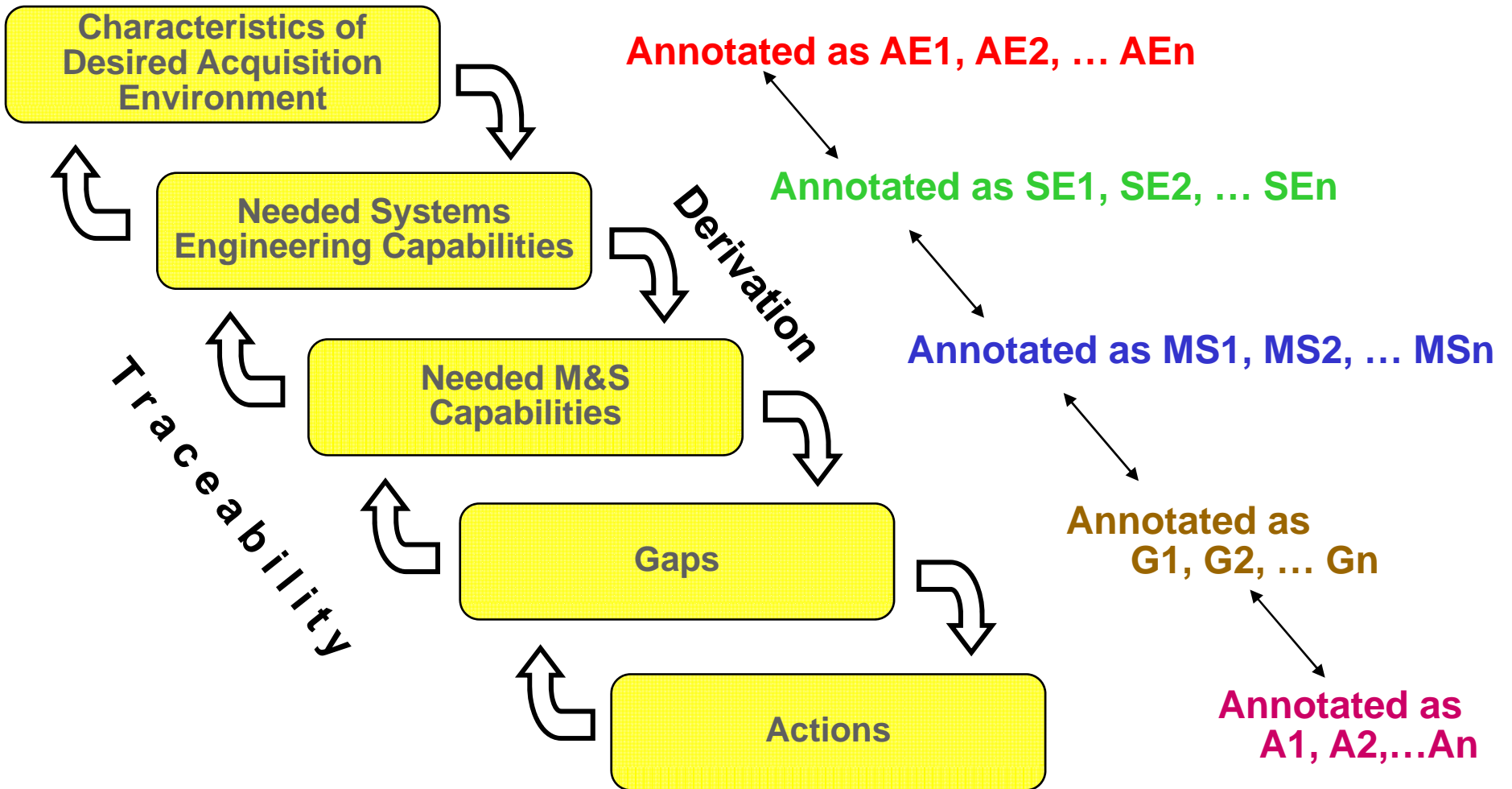
- ❑ Life-cycle-wide view; include manufacturing and sustainment
- ❑ Not try to do the job of program managers; rather, empower them by
 - Removing systemic obstacles in their path
 - Identifying new options for approaching their tasks
 - Fostering widely-needed M&S capabilities that are beyond the reach of individual programs
- ❑ Address M&S issues and actions necessary to enable acquisition of joint capabilities (systems of systems)
- ❑ 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
 - Actions are interrelated; they work together to achieve full effect

Acquisition M&S Master Plan Development Process



Top-Down Derivation/Traceability

CJCSI 3170 & DoDD 5000.1



Assessment of Current Issues/Needs

- ❑ Cooperative effort between AMSWG & NDIA M&S Committee
- ❑ AMSWG venue:
 - Air Force – Roe (Jan 05)
 - Army – Gillis, Wallace (Jan 05)
 - Navy – Vaughn (Feb 05)
 - Visits to NAWC/AD (ACETEF); Army RDECOM; AFMC (SIMAF, ICE)
- ❑ NDIA M&S Committee venue:
 - Joint SIAP Systems Engineering Organization (Aug 04)
 - Future Combat Systems (Sep 04)
 - Missile Defense Agency (Feb 05)
 - Lockheed Martin (Feb 05)
 - Raytheon (Apr 05)
 - Boeing (Apr 05)
 - Northrop Grumman (Jun 05)
 - BAE Systems (Aug 05)
- ❑ Affirmed many findings and recommendations from studies and provided new inputs as well

AMSMP: 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

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

Funding Approach

Prioritized options to accomplish AMSMP actions

1. Accomplish via sweat equity
 - e.g., SSE M&S Cell, cooperative efforts by AMSWG reps
2. Compete for M&S Steering Committee funds (if > acquisition)
3. Submit as SBIR topics (just beginning)
4. Team with other organizations
 - e.g., NII & NAVAIR on Information Assurance (Action 1-6)
5. Compete for OSD study funds, end-of-year “targets of opportunity
6. POM initiatives (none to date)

Example funding successes

- ❖ M&S Resource Reuse Business Model Study (Action 4-3a) \$800k
- ❖ Environmental Scenario Data Generator (Action 4-4d) \$2.3m
- ❖ VV&A Documentation Standardization (Action 4-5a) \$550k
- ❖ LVC (Distributed Simulation) Architecture Roadmap (Action 2-3) \$1.4m
- ❖ Workforce M&S Education (partial Actions 5-1 & 5-3) \$3.2m
- ❖ 3 studies on Best Practices (Actions 1-5, 3-2, & 3-4) \$1.65m total
- ❖ Risk-based VV&A Methods & Guidelines (Action 4-5b) \$750k

Status of Individual Actions

**Caveat: Did not rate down progress for
lateness, unless stalled**

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

- **New DoD M&S management structure in place; effectiveness questioned**
- **Weak DoD Directive finally released Aug 07, with promise of a follow-on DoDI to define key responsibilities and processes, but never issued**
- **Acquisition is largest user of M&S, but doesn't exert proportional influence**
- **Planning and project selection processes do not ensure most important cross-cutting issues are effectively addressed, misusing M&S PE**

Next Steps:

- **Advocate within M&S governance structure for a DoDI on M&S management**
- **Advocate assessing needs & investments at the enterprise level, not at individual community level, using a systematic analysis**

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

- **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 is a prominent part of INCOSE's SE Vision 2020; increasing industry use of MBSE term & tools; several NDIA M&S Committee presentations**
- **Addressed in "M&S Guidance for the Acquisition Workforce" posted on the SSE webpage; expect hot link from DAG soon**

Next steps:

- **Ensure DAG link is completed**
- **Investigate AT&L Knowledge Sharing System (AKSS) as a conduit**
- **Investigate possibility of a CLM on MBSE**
- **Revise guidance as appropriate**

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

- **Joint Test & Evaluation Methodology (JTEM) has delivered Capability Test Methodology under the Testing in a Joint Environment (TIJE) Roadmap (2004)**
- **Services are getting more active (e.g., NAVAIR M&S Enterprise Initiative)**
- **Dec 08 DoDI 5000.02 calls for “appropriate use of accredited M&S...,” but is silent regarding how appropriate use is determined**
- **No DoD policy regarding evaluation of joint capabilities enabled by systems of systems (SoS)**

Next steps:

- **Track TIJE policy and guidance development, support/respond appropriately**
- **Continue working with NAVAIR M&S Enterprise to develop guidance**
- **Draft expanded policy and guidance, vet with the various stakeholders**
- **Submit additional changes to DAG (both T&E and M&S portions)**
- **Evolve M&S in T&E CLM**

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

- SSE submitted language to DoD 5000.2, DAG, & SEP Preparation Guide
- SEP Preparation Guide language not accepted
- Dec 08 DoDI 5000.02 cites M&S as critical and requires PM to “plan for M&S throughout the acquisition life cycle,” **but omitted documentation requirement**
- Addressed in “M&S Guidance for the Acquisition Workforce” posted on the SSE webpage; **expect hot link from DAG soon**
- M&S planning required in pending release of TEMP Planning Guidance

Next steps:

- **Re-engage with Defense Procurement and Acquisition Policy office**
- **Investigate AT&L Knowledge Sharing System (AKSS) as another conduit**

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

- Solicited inputs from AMSWG and industry (through NDIA M&S Cmte)
- Addressed in “M&S Guidance for the Acquisition Workforce” posted on the SSE webpage; expect hot link from DAG soon
- CNA study underway with FY09 M&S SC funding; builds on Action 4-3a M&S Resource Reuse Business Model study and will deliver a CLM

Next steps:

- Evaluate study recommendations, further refining them as required
- Submit recommended guidance to DAG (update) and Contracting for Systems Engineering Guidebook
- Investigate AT&L Knowledge Sharing System (AKSS) as a conduit

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

- 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
- Now included in FY-09 High Level Task led by NII

Next steps:

- Monitor and support High Level Task execution
- Draft, vet, and submit language for inclusion in DAG or M&S Guidance doc
- Investigate AT&L Knowledge Sharing System (AKSS) as a conduit

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
- Per SSE request, M&S CO provided assistance to work with JSF to evolve/refine its metamodel
- Working group has decided key issues and expects to publish a revised version, but progress has lagged due to M&S Cell resource constraints

Next steps:

- JSF complete revised metadata spec with M&S Cell & MSCO assistance
- Coordinate with M&S CO to vet more broadly (likely PA&E interest) and make this a DoD or (preferably) commercial standard
- Submit into DoD Standardization Program process

Objective 2: Enhance the Technical Framework for M&S

2-2. Support development of open commercial and non-proprietary standards for (model-based) systems engineering, 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

- SysML v1.1 published; v1.2 in work; evolution to SysML v2.0 underway
- Increasing usage & teaching of SysML; major subject at INCOSE, NDIA
- DoD awareness is lacking
- 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

- **M&S SC-funded LVC Architecture Roadmap in 2007, due out late 2008, still not released**
- **M&S Cell participated in this project, wrote Business Model and Execution Management sections, and helped coordinate related M&S SC actions (HLA Way Ahead)**

Next steps:

- **Continue to support as requested; await final report; distribute it**
- **Help shape M&S SC response and execution management**

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; revised guidance in DAG

Completion goal: 2007

- 2-4(a): DoDAF Overlay concept has been dropped, so this action is OBE
- 2-4(b): OMG's UPDM (UML Profile for DoDAF/MODAF) nearly finalized, NII has embraced UPDM as an element of DoDAF 2.0 development
- SE Forum considering the value and impact of DoDAF
- ASD(NII) has stated goal of making DoDAF v2.0 more useful for acquisition
- SSE participation in DoDAF WG has been gapped

Next steps:

- Increase involvement in DoDAF WG
- Submit UPDM to DoD Standardization Program / DISR Online
- Advocate use of UPDM 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 addresses this**
- **Will be used in new “M&S Resource Catalog”**
- **Version 1.0 published, being evaluated by users (e.g., MSRR, JDS, JRSG) who are providing feedback to refine it**
- **Lack of standardized keywords makes it hard to search by what’s represented**

Next steps:

- **Evaluate when M&S Catalog is made available for use**
- **Participate in Configuration Control Board to help fix keyword problem**
- **Draft, vet and submit DAG language when appropriate**

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

- **AMSWG has successfully obtained M&S SC funding for several projects**
- **AMSWG has started an effort to pursue SBIR opportunities**
- **AMSWG still does not have an effective voice in other venues that affect M&S capability, such as S&T requirement identification**

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; perhaps cooperatively with SISO and/or SCS**

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

- Have obtained OSD study funds for the definition portion of this task
- Wrote study terms of reference; JHU APL study underway to define best practice
- SISO has established a study group to support the JHU APL study

Next steps:

- Support study via NDIA survey
- Oversee study, assess JHU APL deliverable
- Implement the best practices (via Action 5-4)

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 execution underway, but release stalled
- JFCOM Joint Composable Object Model project underway
- Defense Science Board Task Force chartered to consider M&S support to OSD acquisition operations

Next steps:

- Assess LVCAR, JCOM, and DSB deliverables, implement as appropriate
- Identify remaining actions needed, implement

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)/(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

• **JHU APL study underway on best practices for managing broadly-needed M&S tools**

Next steps:

- **Support JHU APL study with NDIA survey; assess JHU APL deliverables**
- **Accomplish above three steps after best practices are defined**

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

- Addressed in “M&S Guidance for the Acquisition Workforce” posted on the SSE webpage; expect hot link from DAG soon
- SSE M&S Cell assisting as able, but resource limited, not widely advertised
- Navy coming on line, but no action from other Components
- Educating the Workforce project enumerated many knowledge needs and courses and CLMs help fill those needs, but have limited delivery options

Next steps:

- Advertise and expand assist visits; this a 2009 priority
- 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

- High-level discussion included in “M&S for Systems Engineering” CLM
- Addressed in “M&S Guidance for the Acquisition Workforce” posted on the SSE webpage; **expect hot link from DAG soon**
- M&S Planning and Employment Best Practices solicitation completed Apr 07
- Collaborating with NAVAIR M&S Enterprise in developing recommendations
- **Action completion is overdue due to M&S Cell resource constraints**

Next steps:

- **Continue working with NAVAIR M&S Enterprise to develop guidance**
- **Synthesize best practice, conduct AMSWG & NDIA M&S Cmte 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

- CNA's Business Model study identified key issues and recommended actions in 7 areas: IP, contracting, open standards, open source, open business models, license rights, and management of broadly-used tools
- LVC Architecture Roadmap (LVCAR) is addressing business model issues
- JHU APL study on management of broadly-needed tools underway
- **An effective business model is not yet established**

Next steps:

- Brief study to M&S Steering Committee
- Consider findings from LVCAR and JHU APL study on Best Practices for Managing Broadly-needed M&S tools
- Synthesize an integrated execution plan and execute it

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

- Partially addressed in “M&S Guidance for the Acquisition Workforce” posted on the SSE webpage; expect hot link from DAG soon
- CNA Business Model study made recommendations; new study will too
- MIL-STD 3022 and VV&A Documentation tool foster sharing of VV&A info
- “Data Management and Technical Data Rights” policy in new DoDI 5000.02, but doesn’t address key issues identified in business model study

Next steps:

- Coordinate with Defense Procurement and Acquisition Policy office to evolve DoDI 5000.02 guidance on data, and expand to cover other resources and intra-gov’t sharing of gov’t-owned resources

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

- M&S CO project to develop a “M&S Resource Catalog” is in beta testing; but search capability is limited by lack of standard keywords (Action 2-5)
- We see a viable business model as a prerequisite to resource disclosure

Next steps:

- Track M&S CO project, support as able
- Advocate fixing metadata template (Action 2-5) shortfalls
- Execute integrated business model plan per Action 4-3(a)

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

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
- Little progress in 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
- New DoDI 5000.02 has extensive Data Management section 9.a(3)

Next steps:

- Monitor and support JRSG and JDA projects as resources permit
- Investigate data sharing policies of OSD, JCS, and other Components
- Investigate JSC, PAE, & Service scenario data availability & access
- DSB will examine benefits of establishing an capstone M&S capability to inform OSD acquisition decisions; this has data sharing implications

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

- Documentation template established as MIL-STD 3022; positive user feedback
- MIL-STD 3022 is cited in draft revision to DoDI 5000.61 (VV&A)
- Tool to manage documentation developed, but requires CAC (or ECA) to use and only limited VV&A info must be shared. 13 gov't & 12 industry users are currently evaluating tool and the amount of info to be shared.

Next steps:

- Evaluate CAC card and info sharing requirements based on feedback
- Publicize the standard and supporting tool to acquisition PMs
- Establish 5000.61 policy to require sharing VV&A info among organizations
- Establish a commercial documentation standard under SISO

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

- **NAVAIR M&S Enterprise developing M&S VV&A and risk management guidance**
- **On AMSWG recommendation, was explicitly identified by M&S SC as a FY09 “High-Level task”**
- **M&S CO-funded JHU APL project underway to accomplish this action**

Next steps:

- **Assess M&S Enterprise guidance**
- **Oversee M&S CO project, evaluate deliverables and take action as necessary**

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

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

- Addressed in “M&S Guidance for the Acquisition Workforce” posted on the SSE webpage; expect hot link from DAG soon
- SSE M&S Cell gave initial briefing to OUSD(A&T)/SSE/PS; seeing positive impact
- Navy may be addressing this; no other Component activities underway

Next steps:

- Strengthen DAPS methodology, broaden teaching on VV&A examination
- M&S Cell support SSE/AS to accomplish 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

- **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**
- **No known inter-program use of COTS tools for architecture development thus far**

Next steps:

- **Investigate use of SE tools for collaborative architecture development**
- **Propose as a SBIR topic**

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

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

- **AEgis Technologies conducted a study for M&S CO on “Metrics for M&S Investments” that was publicly released Mar 09**

Next steps:

- **Review M&S CO/AEgis study, implement recommendations as appropriate**
- **Capture metrics**
- **Also build M&S investment arguments based on (a) commercial industry practices and (b) lack of viable alternatives (e.g., security, safety, & battlespace constraints; paucity of live assets)**

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 completed with Navy and M&S SC funding. AFAMS has published a recommended “Human Capital Strategy”
- Other lists of required M&S Competencies exist (e.g., industry’s M&S Professional Certification Program)

Next steps:

- Integrate M&S knowledge needs from AFAMS Human Capital Strategy with similar list in M&S Professional Certification Program
- Place under configuration management
- Support implementation as appropriate

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 participated in conferences, workshops, and literature review involving commercial industry use of M&S, capturing relevant points
- Increasing industry adoption of “Simulation-Based Design (SBD)”
- Initial assessment getting stale; regular monitoring and better documentation needed

Next steps:

- Submit as SBIR topic
- Collect and consolidate findings, feed into Action 5-3 BoK

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

- Seven universities have build courses under “Educating the Work Force About M&S project; these comprise an important BoK
- Certified M&S Professional Certification (CMSP) program has a BoK
- SimSummit is building a BoK website
- Knowledge is still being developed (e.g., best practice studies)
- No configuration management yet in place

Next steps:

- Fund integrated of various BoKs into a single BoK, using SimSummit web site
- Establish an effective configuration management process
- Make additional knowledge inputs as they become available

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 >5900 graduates
- CLM on “M&S for Test & Evaluation” released, has >5400 graduates
- Drafted “M&S Guidance for the Acquisition Workforce,” which is posted on the SSE webpage; **expect hot link from DAG soon**
- Universities and NPS have developed M&S courses under “Educating the Workforce” project; M&S Cell critiqued prototype GMU course

Next steps:

- Review and update existing CLMs
- Make DAU course changes based on Education Project deliverables
- Implement additional CLMs as Education Project provides inputs

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
- NDIA M&S Committee meetings have been an excellent information source
- Add'l materials (e.g., best practices) in work
- Resource constrained

Next steps:

- Education Tiger Team examine other delivery means for BoK from education project
- Advertise and expand assist visits
- Hold workshops once recommended practices are in hand

Obj. 5: Shape the Workforce (cont.)

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 AMSWG to tell them what to do
- M&S Cell resource constrained

Next steps:

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

Way Ahead

- ❑ Ensure programs know about and can access deliverables
- ❑ Continue cooperation with Component M&S activities
 - e.g., NAVAIR Enterprise M&S Initiative, JFCOM Common Object Model
- ❑ Continue cooperatively executing the AMSMP
- ❑ Provide direct assistance to programs
 - E.g., at the request of SSE/Assessment and Support, SSE M&S Cell conducted M&S review of Joint Light Tactical Vehicle and FCS
- ❑ Continue to educate and learn via outreach
 - Conferences and workshops, both defense & commercial
- ❑ Support development of useful standards
 - SISO, OMG, ISO, W3C Data Semantics WG, etc.
- ❑ Pursue additional resources (both people and \$)
- ❑ Update AMSMP to refine vision and reflect accomplishments, fact of life changes, and newly-identified needs.

Q & A