MODELING AND SIMULATION GUIDANCE

FOR THE

ACQUISITION WORKFORCE

VERSION 1.01

OCTOBER 2008

Department of Defense

Office of the Deputy Under Secretary of Defense
for Acquisition and Technology

Systems and Software Engineering
Developmental Test and Evaluation

Published July 2008

This publication is intended for use by program managers and systems engineers.

Citation of this guide should appear as follows:
Office of the Deputy Under Secretary of Defense for Acquisition and Technology, Systems and Software Engineering, Developmental Test and Evaluation (ODUSD(A&T)SSE/DTE). Modeling and Simulation Guidance for the Acquisition Workforce, Version 1.0. Washington, DC:, 2008.

To submit questions or corrections, contact the Deputy Director, Developmental Test and Evaluation, ODUSD(A&T)SSE/DTE, 3090 Defense Pentagon Room 2B278, Washington, DC 20301-3090; Attn: Michael Truelove, michael.truelove.ctr@osd.mil, 703-412-3683.

CONTENTS

This page intentionally left blank.

PREFACE

Modeling and Simulation (M&S) capabilities and limitations are often not adequately understood and M&S is sometimes not planned and managed with sufficient care. Although we can model many things quite credibly today, such as physical capabilities, natural phenomena, and physics-based interactions, it is much more difficult to reliably represent things we understand less well, such as human behavior, reliability, and emergent behaviors of complex systems. It must also be remembered that M&S capability involves not just the software tools themselves, but the data that feeds them; the computing platforms that execute them; the standards, middleware and networks that may interconnect them; the encryption capabilities and security constraints that protect them; and, most importantly, the people that plan, develop, integrate, verify, validate, accredit and use them. Deficiencies in any of these present a risk to a program. This guidance is intended to help acquisition managers approach the use of M&S wisely and plan carefully for issues that should be addressed.

This page intentionally left blank.

1. INTRODUCTION

CJCSI 3170.01F, Joint Capabilities Integration and Development System (JCIDS), commits the Department to identification of military needs focused on joint warfighting concepts. Per DoDD 5000.1 and DoDI 5000.2, the DoD has likewise revised its acquisition processes to focus on delivering integrated, network-centric systems of systems (SoS) that provide the material aspect of the needed functional capability. Coincident with this expanded scope is the trend to provide increased capability in smaller and smaller packages, culminating in the emergent nanotechnology revolution.

These changes greatly expand the acquisition trade space and dramatically increase the complexity of systems engineering tasks, including testing. Many more systems, functions, interactions, stakeholders, schedules, budgets, and other variables must be considered as the capability is developed. Both the system and the SoS must be assessed in a representative joint operational environment, yet the scarcity of real equipment, range limitations, security, and safety concerns place significant limitations on live testing.

Modeling and Simulation (M&S) have long played an essential, albeit imperfect, role in system acquisition, operations, and support across the system life-cycle. (Note: The acronym "M&S" is used hereafter to mean inclusively, "modeling and simulation, model, simulation, models and simulations, federations of models and simulations, and other types of distributed simulations.) The above-noted changes have made effective use of M&S even more important, for it is essential to meeting these challenges. Increasingly, capability concepts and system designs are defined by building models within the synthetic environments provided in systems and software engineering tools and computer-aided design (CAD) tools. M&S helps manage complexity by tracking system characteristics, functions, relationships and interactions at the most granular level and then presenting aggregated impacts and higher-level measures of merit to decision makers. System capabilities, processes, workloads, performance, logistics, and cost can be modeled. M&S allows the immersion of warfighters in realistic operational environments to assess concepts, capabilities, and tactics. It can help explore the entire functional capability trade space. Distributed simulation technology allows the flexible mixing of simulations, lab hardware, and real systems into an integrated environment in which to conduct integration and testing.

Effective acquisition requires collaboration among multiple stakeholders. M&S are effective communication means, facilitating shared understanding and insights among warfighters, sponsors, program staffs and industry at a much earlier point than would otherwise be possible. Thus M&S tools linked as needed and combined with an information sharing infrastructure (i.e., integrated data environment - IDE) into a distributed collaborative environment, can enable cost-effective development and sustainment of systems and systems of systems. If program circumstances (e.g., budgets, threats, technology) change, system design and support changes can be made rapidly, with all stakeholders able to play an appropriate role in those decisions.

The comprehensive and integrated use of M&S envisioned under the term simulation-based acquisition (SBA) in the late 1990s has been advanced in various domains under different names. An increasingly widespread instantiation of this concept is termed model-based systems engineering (MBSE). The International Council on Systems Engineering (INCOSE), in its October 2006 version of Systems Engineering Vision 2020, defines MBSE as

"the formalized application of modeling to support system requirements, design, analysis, verification and validation, beginning in the conceptual design phase and continuing throughout development and later life cycle phases." It goes on to say:

MBSE is part of a long-term trend towards model-centric approaches that has evolved in other engineering disciplines, including mechanical, electrical and software. In particular, MBSE is expected to replace the document-centric approach that has been practiced by systems engineers in years past and to become fully integrated into the systems engineering process.

While such observations are justifiably encouraging, acquisition managers must realize that there are still many challenges in achieving effective M&S use. The DoD Acquisition M&S Master Plan, issued under the authority of the DoD Systems Engineering Forum in April 2006, describes the actions being pursued to improve M&S support to acquisition. However, they have not all been accomplished, so acquisition managers must consider remaining impediments in their M&S planning. For instance, M&S capabilities and limitations are often not adequately understood and M&S is sometimes not planned and managed with sufficient care. Although we can model many things quite credibly today, such as physical capabilities, natural phenomena, and physics-based interactions, it is much more difficult to reliably represent things we understand less well, such as human behavior, reliability, and emergent behaviors of complex systems. It must also be remembered that M&S capability involves not just the software tools themselves, but the data that feeds them; the computing platforms that execute them; the standards, middleware, and networks that may interconnect them; the encryption capabilities and security constraints that protect them; and, most importantly, the people that plan, develop, integrate, verify, validate, accredit, and use them. Deficiencies in any of these present a risk to a program.

Thus acquisition managers must approach the use of M&S wisely and plan carefully. The following sections provide guidance on some of the issues that must be addressed.

2. PLANNING M&S USE

Deliberate and disciplined planning, accomplished early and iteratively throughout the program's lifecycle, is essential for effective use of M&S. Typical programs use many, often hundreds, of synthetic environments and M&S to:

- Develop the system concept
- Design the system, including its sustainment
- Assess the merits of alternatives throughout the development cycle
- Integrate the system
- Test the system to verify it meets requirements
- Support system introduction, sustainment and evolution

A program should involve its Operational Test Authority (OTA) in M&S planning to support both developmental test and operational test objectives. Additional guidance regarding the use of M&S in test and evaluation can be found in Sections 9 and 11 of the Defense Acquisition Guidebook.

Although M&S is often regarded as an esoteric discipline, the M&S planning process is logical and straight forward. Following such a process will preclude M&S decisions being ad hoc, undisciplined, or biased by the past experiences and economic interests of the program's contractors.

Staff expertise: Planning should begin by ensuring program staffs are equipped with adequate knowledge regarding M&S strengths and weaknesses, applicable standards, potentially available reusable resources, lessons from other M&S efforts, and options to obtain technical assistance. Responsible personnel should review applicable DoD and Component policies and consult with Component M&S management offices (see list below), the Modeling and Simulation Information Analysis Center (MSIAC), acquisition programs that have faced similar challenges, and other known experts. Training courses, reviews of studies and professional papers on M&S support to acquisition, participation in conferences and workshops targeted toward M&S in acquisition, and perusal of M&S resource registries and repositories also help equip a program's staff with the requisite background information needed to commence M&S planning.

Government-contractor responsibility allocation: One of the important M&S strategy decisions that must be made early in a program is the allocation of M&S responsibility between the government and its contractor(s), with attendant funding and accountability implications. This allocation typically varies by phase, with government M&S activities prominent in the early phases (e.g., Concept Refinement, Technology Development), but the prime contractor assuming a preeminent role after source selection and throughout the Systems Development and Demonstration phase. Government M&S activity typically increases again during Operational Test and Evaluation (OT&E). The program must decide to what degree it wishes to have an independent M&S-based capability rather than just insight into the contractor's M&S activities. The program must also decide whether it will provide, or facilitate providing, the contractor with government-owned M&S tools and data, and if so, what its limits of obligation will be regarding the functional adequacy, trustworthiness, and evolution of such government-furnished equipment or information (GFE/GFI). Verification, Validation, and Accreditation (VV&A) responsibilities must also be allocated (see Section 7 for further discussion).

A systems engineering approach: Synthetic environments and M&S are themselves systems intended to accomplish particular objectives. It follows that M&S planning represents the initial steps of a disciplined system engineering approach, the elements of which are:

- M&S requirements analysis
- Analysis of alternative solutions
- Selection of best solution
- Procurement or development of the selected M&S capability
- Integration, test and evaluation of the M&S capability
- Application/employment of the modeling and simulation capability

Once realized, the M&S capability then typically evolves over time as the program thinks is warranted.

M&S requirements analysis: This begins by defining the program objectives M&S may be able to satisfy. For instance, to design the system and answer questions about system KPPs, MOEs, and MOPs, cost, supportability, safety, or "anything else that keeps the PM up at night." Also identify training objectives to be met, orientation and public relations needs, etc.

Selecting the synthetic environments in which to synthesize the designs is relatively easy, because a wide range of commercial-off-the-shelf systems engineering, CAD, and software development tools are available. Selection among them is largely driven by their functionality, cost, standards compliance, and vendor support fees.

Some mature COTS tools are also available to assess designs (e.g., finite element analysis modeling environments), but the narrower, and largely classified, modeling at the engagement, mission, and campaign levels means that many more government-developed M&S will be candidates for use on the program. The following steps pertain to the program's selection of such M&S.

The contexts in which program M&S objectives must be evaluated (i.e., the questions to be answered) should be identified in parallel with the definition of the objectives. For most programs, expected system operating environments (scenarios, use cases) will be based upon Defense Planning Scenarios, Multi-Service Force Deployments, Design Reference Missions, System Threat Assessment Reports, etc.

For each pair of an individual M&S objective and expected system operating environment, domain information should be gathered to identify what should be represented in M&S to satisfy that objective. The program must decide what entities, attributes, and interactions, have significant impact on the objective and at what level of granularity and fidelity they should be represented. These are derived requirements and together they form a "conceptual model" that specifies the ideal representation capability which candidate models, simulations, and federations will be evaluated against.

M&S user constraints must also be taken into account. These include available staff and funding, program schedule, facilities, allowable response time, required run speed (e.g., in real time), security classification, ITAR restrictions, applicable standards, available computing platforms and networks, and other applicable policies.

Analysis of alternative solutions: With the results of the above requirements analysis in hand, programs should then identify which, if any, models or simulations come close to meeting them. This requires a broad search using electronic means (e.g., the web, the M&S Resource Repository System) and personal contact with M&S offices, similar programs, colleagues, etc. Careful examination of each candidate tool should include its verification, VV&A records. Record the strengths and weakness of each alternative. If no single M&S tool meets requirements, determine whether multiple models and/or simulations, operating serially or in a dynamically-interacting federation, can meet these requirements. If no extant simulation federation satisfies requirements, follow the initial portion of the IEEE Std 1516.3™-2003 IEEE Recommended Practice for High Level Architecture (HLA) Federation Development and Execution Process (FEDEP) to define new federation options.

In evaluating the potential utility of various models, simulations and federations, input data availability must also be considered. The needed data must be accessible and traceable to a trusted source. Its meaning and applicability (context) must be clear to allow appropriate use.

Look for opportunities for M&S reuse across the program life cycle. In considering reuse options, keep in mind that reuse can occur at various points along the M&S development process. Even if a particular M&S does not meet program requirements, consideration should be given to whether any of the earlier artifacts of its development process may be useful for developing a new M&S capability or modifying an existing one. The domain information, conceptual model, algorithms, software components, input data sets, and federation object model may all be reusable in their existing or slightly-modified form. Any reuse decision, particularly the decision to reuse another organization's resource, should be informed by a careful examination of the resource to evaluate its quality and the risks of relying upon it.

Selection of best solution: With the list of candidates and their strengths and weaknesses in hand, identify options that seem feasible and investigate them further only to the extent needed to weigh the options and inform a decision whether to borrow, rent, buy, modify, or build the required M&S capability. In some cases, pursuing an alternate, non-M&S means of satisfying the objective may be the best decision. These decisions should weigh the normal factors of performance, cost, schedule, and risk.

Once the best option has been selected, it will be necessary to coordinate to ensure appropriate funding, personnel, facilities, and equipment are available to execute the selected M&S strategy. Resource levels may require the plans be iterated. It is important that the PM make necessary investments early in the acquisition life cycle to ensure the M&S capability is available when needed.

Planning responsibilities: The M&S planning steps described in Section 2 pertain to an individual M&S objective in the context of the expected system operating environment. Hence many such planning cycles must be accomplished. The government must accomplish such planning for all objectives it intends to satisfy through its own M&S activities. The contractor will conduct its own M&S planning process to support its design, manufacture, assembly, and developmental test responsibilities. However, for the government to exercise oversight of contractor M&S activities with an objective of verifying the system under development satisfies contract provisions, the government must also either carefully monitor or shadow the contractor's planning process.

3. M&S PLANNING DOCUMENTATION

Some DoD Components require acquisition managers to document M&S planning in a stand-alone M&S (or simulation) support plan. Although there is benefit to the program's various M&S practitioners being able to see a consolidated description of the program's M&S intentions, experience has shown such stand-alone documents tend to be ignored by the parties that most need the information therein, namely the systems engineers and T&E personnel. M&S is an inherent part of both systems engineering and T&E and so needs to be integrated with the plans for those activities. M&S plans, at the appropriate level of detail, should also be embedded in the program's Systems Engineering Plan, Test & Evaluation Strategy (TES), and Test and Evaluation Master Plan (TEMP).

4. INTER-ORGANIZATION REUSE RESPONSIBILITIES

The reuse of one government organization's resource by another organization should be agreed to in writing (e.g., via a memorandum of agreement), listing the responsibilities of both parties. Such an agreement should:

- Explicitly define the parties and the resource(s);
- Specify the compensation to be provided by the resource consumer;
- Specify the resource provider's support to the consumer, including the provision of any relevant documentation and the disclosure of any known deficiencies;
- Obligate the consumer to inform the provider of any deficiencies he discovers in the resource or any adverse inference he draws regarding the provider's system;
- Prohibit the inappropriate or damaging misuse of the resource by the consumer, including using it to criticize or otherwise hinder the provider's program; and
- Obligate the consumer to deliver to the provider any changes he makes to the resource (for the provider's optional incorporation into his version of the resource).

5. INFORMATION MANAGEMENT

As noted above, an information sharing infrastructure (i.e., integrated data environment - IDE) is a necessary part of the collaborative environment (CE) needed to support all acquisition activities, including M&S. M&S should share the common information base with the rest of systems engineering. The IDE should allow data producers to publish their data items and record required metadata. The IDE shall also allow data consumers, from their desktop, to readily discover (via browsing and searching), access (via proper access controls), understand, and download the data they need. Metadata is critical to the discovery and understanding functions. The metadata that accompanies each data item should provide the information needed to understand its structure, lineage, and meaning, including its context and applicability. This same metadata will facilitate VV&A and will allow the data it describes to be transformed into the form needed by the consuming M&S tool. Particular sets of data items will describe the system at a particular point in its development and as such will inform program events and provide the information foundation for program activities, including M&S-based analyses. The IDE should have an archiving capability so that the program can, at any future time, identify the information set that was used to inform a decision.

6. CONTRACTING

Close coordination is necessary between the program office's M&S lead and its Contracts Officer. Contracting strategies, solicitation, and contract provisions must be consistent with the decided division of responsibilities (as discussed previously). Particular attention should be paid the GFE/GFI aspects discussed in Section 2.

RFP language and contract provisions should address M&S representation requirements; data rights; the contractor's own M&S planning and documentation thereof, including the examination of reuse opportunities; expectations regarding the sources of M&S tools and data; the ownership and maintenance of government-funded M&S resources; VV&A requirements;

standards that must be complied with; government user support; access control; and metrics and documentation requirements, all across the system's full life-cycle.

Indicators of contractor M&S expertise should be considered in defining source selection criteria. Contractor attributes that have a direct relationship to successful M&S use may include:

- A documented systems-engineering process showing its organizations, activities, the specific M&S tools used by each, and the information flows among them;
- An existing information sharing infrastructure (i.e., integrated data environment) providing enterprise team members, on a nearly continuous, from-the-desktop basis, the capability to discover, access, understand and download a comprehensive set of authoritative, accurate and coherent product development information. The data items provided by this system should be accompanied with metadata providing the pedigree and sufficient applicability and context information to guide their valid use;
- Successful experience using a wide variety of M&S, both for design (prescriptive modeling environments such as systems engineering tools, CAD, and software design tools) and assessment (descriptive M&S), from the engineering to mission levels;
- Successful participation in federations or other types of distributed simulations using an open standard architecture e.g., the High Level Architecture (IEEE Std 1516™-2000 HLA Framework and Rules; IEEE Std 1516.1™-2000 HLA Federate Interface Specification; IEEE Std 1516.2™-2000 HLA Object Model Template Specification).;
- A record of reuse of M&S tools and information produced by other organizations (government, industry and COTS);
- A documented VV&A process, with records indicating a history of compliance; and
- A staff with documented M&S expertise.

7. M&S CREDIBILITY/VV&A

The credibility, i.e., trustworthiness, of M&S is a paramount issue. If M&S cannot provide credible insights, the program is ill-served and the M&S investment wasted.

Per DoDI 5000.61, *DoD Modeling and Simulation (M&S) Verification, Validation and Accreditation (VV&A)*, dated May 13 2003, "*Models and simulations used to support major DoD decision-making organizations and processes …shall be accredited for that specific purpose by the DoD Component M&S Application Sponsor.*" So for any M&S use that informs significant acquisition decisions, such as system verification, DoD Policy requires that it be

- Verified (determining that an M&S implementation and its associated data accurately represent the developer's conceptual model and specifications);
- Validated (determining the degree to which an M&S and its associated data are an accurate representations of the real world from the perspective of the intended uses for the model); and
- Accredited (official certification that an M&S and its associated data are acceptable for use for a specific purpose).

When arguing for a certain decision at least partially based on M&S, it is the advocate's responsibility to unambiguously state the purpose, key assumptions, and significant limitations of each M&S when results are presented. Conversely, it is a responsibility of acquisition oversight personnel to examine the relevant VV&A records whenever a major acquisition decision is informed by M&S.

All information used to build M&S representations, whether in the form of data sets or software algorithms, must be traceable to an authoritative source. An IDE, discussed above, will help establish this traceability. Data or models provided by the Defense Intelligence Agency and its associated Intelligence Centers should be used to instantiate threat representations. Use data from system testing to improve and revalidate the M&S used to plan T&E events. Using the model-test-fix-model process, both the M&S and live testing can be iteratively improved.

It is recommended that for any contractor-performed, M&S-based analysis that verifies the system under development meets contractual requirements, the government be the accrediting authority and the contractor perform the verification and validation activities and prepare the accreditation support package that informs the government's accreditation decision. Consult DoDI 5000.61, *DoD Modeling and Simulation (M&S) Verification, Validation and Accreditation (VV&A)*, for additional policy and guidance.

The DoD VV&A Recommended Practices Guide provides a a collection of best practices that are helpful for understanding what the VV&A processes entail and defining an appropriate VV&A approach: http://vva.dmso.mil/ or http://vva.msco.mil/.

If done during M&S and data development, verification and validation are modest quality assurance investments in addition to being standard systems and software engineering processes. If VV&A processes are performed after the M&S and database development efforts and in the absence of documentation of the development or previous VV&A efforts, VV&A will cost more. In those cases, the cost of implementing the VV&A will be commensurate with cost to produce the necessary information, so prudent judgment will be needed to define the VV&A effort.

The importance of VV&A is directly related to the criticality of the decision being informed by M&S, so the V&V investment should be weighed against the risk of making a decision based on unreliable M&S results. For instance, there is potential loss of life if a new aircraft is released for first flight based on less than trustworthy structural strength or flight dynamics model results, but there is less risk regarding a model that predicts fuel required to fly a certain flight profile. As well, not all the software components within an M&S represent equal risk regarding the outcome. Sensitivity analysis and an understanding the pedigree of each software component will allow an informed judgment as to where V&V should be focused for the greatest reduction in the risk of a misleading result.

Although the DoD VV&A Documentation Tool (DVDT) is not available yet, it is under development and will be deployed in 2008. The DVDT automates the production of the four VV&A documents captured in the standard templates formalized in MIL-STD-3022. This automation also enables the sharing of information about VV&A documents across the Global Information Grid (GIG) enterprise.

IEEE Std 1516.4™-2007, *IEEE Recommended Practice for Verification, Validation, and Accreditation of a Federation—An Overlay to the High Level Architecture Federation Development and Execution Process,* was approved in 2007 and is available for purchase at http://www.ieee.org. The recommended practice defines the processes and procedures to implement VV&A for federations being developed using the High Level Architecture Federation Development and Execution Process. The recommended practice focuses on the unique aspects of VV&A of federations, including those federations that use live, virtual, and constructive components.

MIL-STD-3022 provides a common framework for documenting information produced during the VV&A processes by establishing templates for documenting VV&A planning, implementation, and reporting. This standard practice may be cited as a contractual requirement in contracts. Additionally, Data Item Descriptions that can be listed on the Contract Data Requirements List (DD Form 1423) are available for each individual document. MIL-STD-3022 and the Data Item Descriptions are available from the ASSIST database at http://assist.daps.dla.mil/.

8. STANDARDS

Implementing standards are necessary to facilitate data sharing and the interoperability and reuse of M&S resources.

The Defense Information Standards Repository Online (DISRonline), formerly the Joint Technical Architecture, lists approved information technology standards for use by DoD programs. It is managed by the Defense Information Systems Agency and does not have a public website but it does have a website that can be accessed with a password and userid at: https://disronline.disa.mil/

8.1. Military Standards related to VV&A

- MIL-STD-3022, Department of Defense Standard Practice Modeling and Simulation (M&S) Verification, Validation, and Accreditation (VV&A) Documentation Templates, 28 January 2008
- DI-MSSM-81750 Department of Defense (DoD) Modeling and Simulation (M&S) Accreditation Plan
- DI-MSSM-81751 Department of Defense (DoD) Modeling and Simulation (M&S) Verification and Validation (V&V) Plan
- DI-MSSM-81752 Department of Defense (DoD) Modeling and Simulation (M&S) Verification and Validation (V&V) Report
- DI-MSSM-81753 Department of Defense (DoD) Modeling and Simulation (M&S) Accreditation Report

8.2. Open Commercial Standards for Connecting Simulations in Federations

- IEEE 1278 (Series), IEEE Standard for Distributed Interactive Simulation (DIS)
- IEEE 1516 (Series), IEEE Standard for Modeling and Simulation (M&S) High Level Architecture (HLA)

Program M&S leads should consult with their Component's M&S Management Office for additional guidance regarding standards to be followed.

9. ADDITIONAL M&S RESOURCES

In addition to those resources mentioned in the previous sections, the following resources might prove helpful.

9.1. Reference Documents

- DoD Directive 5000.59, Modeling and Simulation Management
- DoD 5000.59-M, Glossary of Modeling and Simulation Terms
- DoD 5000.59-P, Modeling and Simulation (M&S) Master Plan

9.2. M&S-Related Organizations

- DoD Modeling and Simulation Coordination Office: http://www.msco.mil
- Army Modeling and Simulation Office: http://www.amso.army.mil
- Navy Modeling and Simulation Office: https://nmso.navy.mil/
- Air Force Agency for Modeling and Simulation: http://www.afams.af.mil
- DoD M&S Information Analysis Center (MSIAC): http://www.dod-msiac.org/
- DoD Survivability/Vulnerability Information Analysis Center (SURVIAC): http://www.bahdayton.com/surviac/
- NDIA Systems Engineering Division M&S Committee: http://www.ndia.org/divisions/modeling
- Simulation Interoperability Standards Organization: http://www.sisostds.org
- Institute of Electrical and Electronics Engineers: http://www.ieee.org

9.3. Education and Training

- Defense Acquisition University (DAU) resources and courses: http://www.dau.mil
- DAU Continuous Learning Modules, particularly the M&S in Systems Engineering (CLE 011) and M&S in T&E (CLE 023) modules: http://www.dau.mil/onlinecatalog/onlinecatalog/tabnav/tabnavcl.asp
- DoD M&S Conference: links from http://www.msco.mil/DMSC.html
- Interservice/Industry Training, Simulation, and Education Conference (I/ITSEC): http://www.iitsec.org
- Simulation Interoperability Workshops: http://www.sisostds.org
- Various commercially provided M&S courses

This page intentionally left blank.

MODELING AND SIMULATION GUIDANCE FOR THE ACQUISITION WORKFORCE

VERSION 1.0
JULY 2008

Department of Defense

Office of the Deputy Under Secretary of Defense
for Acquisition and Technology

Systems and Software Engineering
Developmental Test and Evaluation
3090 Defense Pentagon Room 2B278
Washington, DC 20301-3090