

**BY ORDER OF THE SECRETARY
OF THE AIR FORCE**

AIR FORCE INSTRUCTION 16-1005

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Operations Support

**MODELING & SIMULATION
MANAGEMENT**

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This instruction implements Air Force Policy Directive (AFPD) 16-10, *Modeling and Simulation*. This instruction outlines AF M&S general policy, assigns key roles and responsibilities, and describes AF participation in select M&S forums. It applies to all AF activities using M&S. This instruction applies to the Air National Guard (for the purposes of AFI 16-1005 Tier Authorities, NGB is considered a MAJCOM) and the Air Force Reserve. It establishes forums for collaboration and funding advocacy for programs that will enhance AF operational readiness. It identifies enterprise architecture, data exposure, and metadata management functions and responsibilities. To recommend changes or identify conflicts between this and other departmental publications, use the AF Form 847, *Recommendation for Change of Publication*, and route it through publishing channels to the Office of Primary Responsibility (OPR) for this directive, AF/A3OT Workflow (usaf.pentagon.af-a3.mbx.a3ot-workflow@mail.mil) or 1480 Air Force Pentagon, Washington, DC 20330-1480. This publication may be supplemented at any level, but all direct supplements must be routed to the OPR of this publication for coordination prior to certification and approval. Ensure that all records created as a result of processes prescribed in this publication are maintained IAW Air Force Manual (AFMAN) 33-363, *Management of Records*, and disposed of IAW the Air Force Records Disposition Schedule (RDS) in the Air Force Records Information Management System (AFRIMS). The authorities to waive wing/unit level requirements in this publication are identified with a Tier ("T-0, T-1, T-2, T-3") number following the compliance statement. See AFI 33-360, *Publications and Forms Management*, for a description of the authorities associated with the Tier numbers. Submit requests for waivers through the chain of command to the appropriate Tier waiver approval authority, or alternately, to the Publication OPR for non-tiered compliance items. In accordance with the acquisition chain of authority specified in AFI 63-

101/20-101, *Integrated Life Cycle Management*, mandates to the acquisition execution chain are not considered Wing level mandates and tiering per AFI 33-360 does not apply. See Attachment 1 for a glossary of references and supporting information. Note that to avoid confusion, the acronym “LVC-OT” will be used to refer to Operational Training and “OT” by itself refers to Operational Testing.

Section A—General

1. Scope. This directive applies to all Modeling & Simulation (M&S) assets within AF purview, excluding Special Access Programs (SAP)/Special Access Requirements (SAR). Nothing in this directive shall alter or supersede the existing authorities and policies of the Director of National Intelligence regarding the protection of Sensitive Compartmented Information (SCI) and SAP for intelligence. This instruction recognizes that special measures may be required for protection and handling of foreign intelligence or counterintelligence information, or other need-to-know information. Accordingly, implementation of this instruction must be tailored to comply with coordinated Intelligence Community Directives, Policies, and Guidance from the Office of the Director of National Intelligence (ODNI). The application of the provisions and procedures of this directive to SCI or other SAP M&S is encouraged where they may complement or address areas not otherwise specifically addressed.

2. Background.

2.1. AF M&S is a key enabler supporting test and evaluation throughout the acquisition process; accelerating and enhancing existing Air Force warfighting capabilities, and generating decision quality information. The purpose of this instruction is to implement DoDD 5000.59, *DoD Modeling and Simulation (M&S) Management*, through an AF M&S governance structure and DoDI 5000.70, *Management of DoD Modeling and Simulation (M&S) Activities*. M&S management shall develop plans, programs, procedures, issuances, and pursue common and cross-cutting M&S tools, data, and services to achieve DoD’s goals by: promoting visibility and accessibility of models and simulations; leading, guiding, and shepherding investments in M&S; assisting collaborative research, development, acquisition, and operation of models and simulations; maximizing commonality, reuse, interoperability, sustainment, efficiencies and effectiveness of M&S, and supporting DoD communities that are enabled by M&S.

2.2. AF M&S is aligned under three pillars: (1) Live, Virtual, and Constructive Operational Training (LVC-OT) led by AF/A3, (2) Integrated Life Cycle Management (ILCM) led by SAF/AQ, and (3) Decision Support led by AF/A9.

3. Guidance.

3.1. The AF shall advise the appropriate Secretary of Defense on key AF M&S capabilities.

3.2. The AF shall pursue the efficient and effective development, use, and reuse of M&S capabilities and resources.

3.3. The AF shall apply M&S capabilities needed to support the effective and efficient accomplishment of mission objectives, requirements development, acquisition, test and evaluation, and training.

3.4. The AF shall make M&S assets visible and accessible within and across the DoD components.

3.5. The AF shall reference the DoD M&S discovery metadata search capability when assessing existing M&S assets for reuse.

4. HQ USAF Responsibilities.

4.1. All Secretary of the Air Force (SAF) Assistant Secretaries (AS) or Deputy Assistant Secretaries (DAS) and Air Force (AF) Deputy Chiefs of Staff (DCS) or Assistant Chiefs of Staff (ACS) will:

4.1.1. Identify and develop functional M&S requirements and capabilities within their functional areas.

4.1.2. Maximize reuse of M&S models and data.

4.1.3. Advocate for respective functional M&S workforce education and training requirements.

4.2. Deputy Chief of Staff for Operations (AF/A3), will:

4.2.1. Serve as the approval authority for overall AF M&S policy including integrated operational training and training devices.

4.2.2. Serve as lead for AF M&S LVC-OT.

4.2.3. Lead AF M&S policy, guidance, and process decisions to maximize the impact of M&S capabilities on operational readiness.

4.2.4. Appoint the Secretariat for the AF M&S Steering Committee (SC).

4.2.5. Serve as co-chair with AF/A9 and SAF/AQ in the M&S Governance Structure.

4.2.6. In coordination with AF/A9 and SAF/AQ, act as AF advocate for M&S and performs M&S enterprise-level functions that facilitate coordination among M&S activities AF-wide and with industry, Service Components, interagency, academia, and international partners.

4.2.7. Manage enterprise-level standards and standardization activities. In coordination with AF/A9 and SAF/AQ, coordinate M&S standards activities with national and international M&S standards development and standards setting organizations.

4.2.8. In coordination with AF/A9 and SAF/AQ, advocate for M&S programs and initiatives through the Air Force Corporate Structure (AFCS) and maintain insight into M&S investments AF-wide.

4.2.9. Designate AF/A3O as waiver authority for items under AF/A3 responsibility in this AFI.

4.3. Deputy Chief of Staff, Intelligence, Surveillance and Reconnaissance (AF/A2) will:

4.3.1. Issue plans, directives, procedures, and publications for the management and approval of intelligence, surveillance, and reconnaissance (ISR) M&S in coordination with AF, DoD, and Defense Intelligence Enterprise (DIE) components.

- 4.3.2. Encourage the use of M&S within the Air Force ISR community, enhance ISR support to Air Force M&S activities, and act to integrate ISR mission data requirements into the M&S process for threat, Blue ISR capability, and geospatial data.
 - 4.3.3. Represent AF ISR interests on all applicable M&S issues and provide ISR representation at the DoD level as requested by the Secretary of the Air Force.
 - 4.3.4. Ensure ISR M&S activities comply with Intelligence Community or DoD level standards, interface, portability, and architecture policies.
- 4.4. Director, Studies, Analyses, and Assessments (AF/A9), will:
- 4.4.1. In coordination with AF/A3, SAF/AQ, and other appropriate AF organizations, advise OUSD (AT&L) and the Defense Modeling and Simulation Coordination Office (DMSCO) on key AF M&S capabilities and uses.
 - 4.4.2. Serve as or designate the AF representative to the DoD M&S SC.
 - 4.4.3. Serve as co-chair with AF/A3 and SAF/AQ in the M&S Governance Structure.
 - 4.4.4. Serve as the AF lead for M&S supporting Decision Support activities. Review, align, and institutionalize AF Decision Support enterprise policy and procedures to facilitate the development of architectures, requirements, and investment strategies for Decision Support M&S.
 - 4.4.5. Recommend policies, plans, and programs to the AF M&S Governance bodies that support the AF M&S Strategic Vision and priorities.
 - 4.4.6. Act as AF advocate for M&S Decision Support matters and perform M&S enterprise-level functions that facilitate coordination among M&S activities AF-wide, with industry, Service Components, academia, and international partners.
- 4.5. Assistant Secretary of the Air Force, Acquisition (SAF/AQ) will:
- 4.5.1. Lead AF acquisition and Integrated Life Cycle Management M&S policy, guidance and process decisions to ensure efficient, effective use of M&S capability in programs and have optimal impact on capability development.
 - 4.5.2. Serve as co-chair with AF/A3 and AF/A9 in the M&S Governance Structure.
 - 4.5.3. Encourage applicable reusability of architectures, frameworks, models, simulations, applications, data, and processes within programs and across the acquisition enterprise.
 - 4.5.4. In coordination with DoD, Service Components, industry and academia, develop and advocate for acquisition architectures and frameworks.
 - 4.5.5. Delegate to SAF/AQR the co-chair of the AF M&S SC.
 - 4.5.6. Represent the AF and advocates AF service positions on DoD M&S acquisition committees, groups, and forums.
- 4.6. Chief, Information Dominance and Chief Information Officer (SAF/CIO A6), will consider AF M&S capability requirements when defining and maintaining the AF Enterprise Architecture.
- 4.7. Director, Air Force Test and Evaluation Directorate (AF/TE) will:

4.7.1. Advise Air Force senior leadership on the use of M&S in test and evaluation (T&E).

4.7.2. Develop T&E policy and establish guidance on the use of M&S in T&E.

4.7.3. Manage Air Force test infrastructure and determine adequacy of T&E resources to support system lifecycle activities, of which M&S is a foundational element.

4.7.4. Be consulted with when test M&S policy issues are an agenda item for SAF/AQ or A9 in internal or external M&S forums.

4.8. Air Force Surgeon General (AF/SG) will develop policy and oversee modeling and simulation used to assist training for medical and surgical providers, nurses, and Allied Health professionals.

5. Commanders/Directors at all levels. The Commander/Director will:

5.1. For key M&S assets currently being developed, managed, or maintained within their respective organizations, ensure the organization or acquisition agency uploads M&S discovery metadata to a system capable of providing data to the OSD repository in the required format and includes all required information per DoDI 5000.70. (T-0) See paragraph 8.2.3 and 8.2.6 in this instruction for additional guidance.

5.2. AF organizations designated as an M&S Executive Agent (MSEA) will have both AF and DoD responsibility for the respective DoD application.

5.3. Ensure M&S systems include the requirement to obtain certified data and models from the authoritative source when available and feasible. (T-1) Coordinate with authoritative source providers to plan necessary resources to satisfy requirements with consideration to program cost, schedule, and performance objectives. (T-1) Reference AFI 16-1001, *Verification, Validation, and Accreditation (VV&A)*, regarding VV&A requirements.

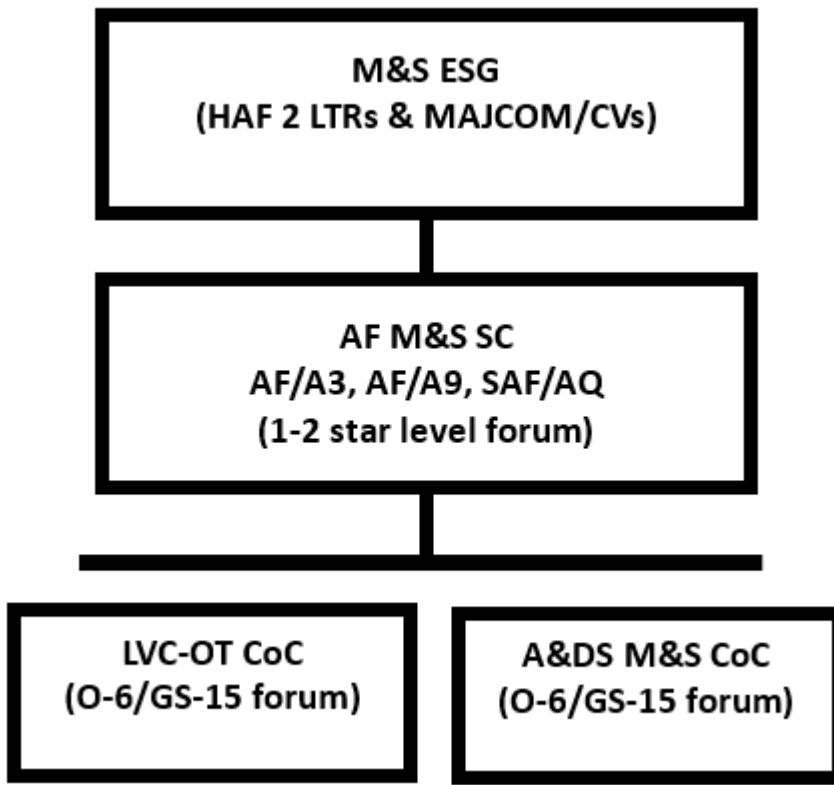
5.4. Ensure their systems comply with appropriate cybersecurity Authorizing Official approval guidance for given configurations and within the timeframe specified for the approval.

5.5. Headquarters Air Education and Training Command's Surgeon General is designated the lead for the Distributed Human Patient Simulation Training Program for Air Force Medical M&S.

6. Governance.

6.1. The AF M&S governance structure defines a strong partnership responsible for developing AF M&S priorities; balancing, assessing and measuring the effectiveness of capability-based programming; and advising AF senior leaders on programming M&S capabilities. The AF M&S Governance Structure integrates into other AF-level governing bodies and councils to ensure AF M&S equities are adequately represented, as appropriate. Any organization with AF M&S interests may participate in the AF M&S Governance structure. Senior leader oversight and strategic-level guidance for overall M&S program governance structure are provided, as applicable depending on the specific issue (operational, technical, programmatic, or acquisition), by the Executive Steering Group, AF M&S Steering Committee, and two M&S Council of Colonel (O-6/GS-15) supporting bodies (Figure 1).

Figure 1. Air Force M&S Governance Structure.



6.2. Air Force Modeling and Simulation Executive Steering Group (ESG). The M&S ESG may be convened on an as-needed basis. The M&S ESG serves as the authoritative governance body for all AF M&S activities and operates in conjunction with the AFCS. The M&S ESG meets as required and is governed by a tri-chair management structure, with co-chairs consisting of AF/A3, AF/ A9 and SAF/AQ. Members of the M&S ESG include MAJCOM/CVs, functional HAF 2-letters (e.g., TE, FM, A1, A2, A4, etc.) and others identified dependent on the issues/agenda. The key functions of the M&S ESG are to make decisions and resolve issues, including non-material AF M&S solutions, funding recommendations and positions, elevated by subordinate groups in the AF M&S governance structure, and provide the functional communities priorities and vision for the development and sustainment of M&S capabilities.

6.3. Air Force M&S SC. The purpose of the AF M&S SC is to facilitate communications between AF/A3, AF/A9 and SAF/AQ and the M&S Stakeholders represented by the functional HAF 2-letters at the 1-2 star level. The overall objective is to encourage communications flow between the three designated AF M&S pillars (LVC-OT, ILCM, and Decision Support) and to ensure significant M&S issues are brought forward to the ESG for resolution. The AF M&S SC is governed by a tri-chair management structure, with co-chairs consisting of AF/A3, AF/ A9 and SAF/AQ that meet on an as-required basis. The M&S SC Secretariat is appointed by AF/A3. The key functions of the M&S SC are:

6.3.1. Approve management processes that provide visibility and access into AF M&S programs and activities.

6.3.2. Promote the adoption and facilitate the coordination of policies, and provide guidance that (1) encourages the commonality, reuse, interoperability, efficiencies, and effectiveness of AF M&S data, tools, and services; and (2) facilitates the application of M&S across the AF M&S communities.

6.3.3. Approve coordination efforts external to the AF when accomplishing M&S coordination agent responsibilities.

6.3.4. Approve policy and provide guidance that facilitates application of M&S across the AF M&S communities.

6.3.5. Recommend AF M&S goals, objectives, and a strategy including investment recommendations and plan to achieve them.

6.3.6. Promote the use of best practices and technologies from the other Services, Departments, Agencies and Industry.

6.3.7. Approve the plans for developing the AF M&S workforce (developers and managers) and promoting M&S education and training for the workforce in the using communities.

6.4. AF M&S Council of Colonels (O-6/GS-15) bodies. The Council of Colonels (CoC) governing bodies are the next level of governance, directly below the AF M&S SC. There are two AF M&S CoC governing bodies, depending upon the nature of the M&S topic or area of concern. These organizations support both the AF M&S SC and AF M&S ESG activities. Both bodies will vet issues requiring senior leader visibility and decisions, and make recommendations and develop proposed courses of action for approval and resolution at the higher level of M&S governance.

6.4.1. The LVC-OT CoC roles, responsibilities, and membership are addressed in AFI 16-1004, *LVC-OT Management*.

6.4.2. Acquisition and Decision Support (A&DS) M&S CoC. This CoC orchestrates AF-wide A&DS M&S strategy and requirements. This CoC is co-chaired by AF/A9 and SAF/AQR and has representation from key stakeholders and appropriate analytic support organizations. Key functions of this body include:

6.4.2.1. Develop management processes that provide visibility and access into AF A&DS M&S programs and activities.

6.4.2.2. Develop policy and recommended guidance that encourages the commonality, reuse, interoperability, efficiencies, and effectiveness of AF A&DS M&S data, tools, and services.

6.4.2.3. Develop coordination efforts external to the AF when accomplishing A&DS M&S coordination agent responsibilities.

6.4.2.4. Develop policy and provide guidance that facilitates application of A&DS M&S across the AF M&S communities (acquisition, analysis, planning, testing, and experimentation).

6.4.2.5. Develop and recommend best practices and technologies from the other services, departments, government agencies, and industry.

6.4.2.6. Develop the plan for AF A&DS M&S workforce (developers and managers) development, and promote M&S education and training for that workforce in the using communities.

6.4.2.7. Recommend AF A&DS M&S goals, objectives, and a strategy including investment recommendations and plans to achieve them.

7. M&S Standards and Architecture.

7.1. Architectures and technical standards are key enabling elements to meet the M&S objective the best use of technology to provide the highest quality test, evaluation, analysis, and training.

7.1.1. Standard Architectures. Open, net-centric, interoperable standards shall be used to achieve an integrated operational architecture that is a scalable and interoperable M&S system of systems that allows for efficient interoperability within the AF and with other DoD components.

7.1.2. Use of Specifications and Standards. Specifications and standards shall be used as feasible in solicitations and contracts to define essential standard practices (e.g., system safety and parts management) and technical requirements (e.g., materiel interoperability and support requirements) and to manage risk.

7.2. Requiring agencies, in coordination with program offices, will:

7.2.1. Ensure that ODNI, OSD, Joint, or AF-approved data standards are adopted as feasible in newly developed and redesigned AF M&S applications and, when feasible, in existing systems (T-0). Open or industry standards will be used where no ODNI, OSD, Joint, or AF standard has been identified. (T-0) This requirement does not apply to the internal storage, processing, or distribution of data within a system, or to standalone systems that will not exchange data with any other system.

7.2.2. Consider new technologies or standardized advanced computing environments to maximize scalability, accessibility, and efficiency while also reducing IT and infrastructure costs at forward sites and the level of effort for cybersecurity compliance. (T-0)

7.3. Throughout a program's lifecycle, program managers shall obtain data and models from authoritative sources when available and feasible, and coordinate with authoritative source providers to plan necessary resources to satisfy requirements with consideration to program cost, schedule, and performance objectives. (T-2) Program managers for legacy programs must consider using authoritative data and models and determine if integration is fiscally and technically feasible.

7.4. AF organizations identified as M&S authoritative data sources will comply with AFI 33-115 and AFI 33-401 guidance for their authoritative data, and register it in the appropriate registry upon approval of the appropriate governance body. (T-1) AF organizations providing authoritative models will also comply with AFI 16-1001 for the verification, validation, and accreditation of those models. (T-1)

8. M&S Data Discovery and Management.

8.1. Effective data management is critical to providing flexible and responsive M&S capabilities. AF M&S discovery metadata will comply with AFI 33-115 guidance and will also be discoverable, searchable, and retrievable using the DoD M&S discovery metadata search capability except where security classification precludes exposure. (T-1)

8.1.1. M&S data discovery and exposure will adopt operational system data discovery and exposure interfaces and standards to minimize unique system interfaces for M&S applications. (T-1)

8.1.2. In cases where AF M&S data discovery policy appears to conflict with operational data discovery policy, the operations policy shall always take precedence for compliance.

8.1.3. When proprietary or intellectual property considerations and restrictions apply to M&S assets, all restrictions on use and reuse will be clearly noted in discovery metadata. (T-0)

8.1.4. Visibility and accessibility shall be facilitated by creating and associating discovery metadata to key M&S assets. (T-0)

8.2. M&S Data and Services Source Functional Owner Responsibilities.

8.2.1. Ensure that information needed to support consuming IT capabilities is exposed and ensure they are loaded into a registry for discovery availability. (T-1)

8.2.2. Develop and maintain current discovery metadata on key M&S assets they are developing, managing, or maintaining pursuant to DoDI 5000.70. M&S discovery metadata shall be visible, accessible, and discoverable in the DoD M&S discovery metadata search capability except where security classification precludes exposure. (T-1)

8.2.3. Review the DoD M&S discovery metadata search capability for reuse opportunities prior to initiating development of M&S assets. The DoD M&S discovery metadata search capability will be used to research for M&S reuse opportunities as part of historical data research prior to initiating development of M&S assets in order to reduce duplication of existing technology and products. (T-1)

8.2.4. Identify those cases in which data and services exposure is not possible due to system constraints or where optimal or authoritative M&S source data or models do not exist and document in accordance with the DoD standard. (T-1)

8.2.5. Comply with relevant data standards for exposure, discovery, tagging and access. (T-1)

8.2.6. To the maximum extent possible, upload M&S discovery metadata to a system capable of providing data to the OSD repository in the required format and includes all required information per DoDI 5000.70. Systems may employ other registries (e.g., Space and Cyberspace Analysis Resource Portal (SARP), web link: <https://halfway.peterson.af.mil/SARP/>) if they have classification or other issues that preclude the use of the DoD registry. (T-1)

9. M&S Professional Workforce.

9.1. M&S has a unique core body of knowledge that needs an appropriate mix of professional M&S personnel including officers and government civilian employees in diverse organizations. There is no separate M&S career field, so tracking and management of this expertise is achieved through special experience identifiers (SEI) in accordance with AFI 36-2101, *Classifying Military Personnel (Officer and Enlisted)*.

9.2. While personnel in Analytical, Test, Evaluation, and Acquisition positions have M&S training incorporated into existing qualification programs, they will not be awarded an M&S SEI as part of their normal career progression unless they complete the associated prerequisites.

9.3. Unit commanders will recommend Unit Manpower Document positions with special experience or knowledge requirements for appropriate M&S SEI coding by the respective MAJCOM functional manager. (T-1)

JOHN W. RAYMOND, Lt Gen, USAF
Deputy Chief of Staff, Operations

Attachment 1**GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION*****References***

DoD Directive 5000.59, *DoD Modeling and Simulation (M&S) Management*, 8 August 2007

DoD Instruction 5000.61, *DoD Modeling and Simulation (M&S) Verification, Validation, and Accreditation*, 9 December 2009

DoD Instruction 5000.70, *Management of DoD Modeling and Simulation (M&S) Activities*, 10 May 2012, Chg 1, 19 March 2014

DoD Directive 8000.01, *Management of the Department of Defense Information Enterprise*, 10 February 2009

DoD Instruction 8320.02, *Sharing Data, Information, and Information Technology (IT) Services in the Department of Defense*, 5 August 2013

DoD Instruction 8330.01, *Interoperability and Supportability of Information Technology (IT) and National Security Systems (NSS)*, 21 May 2014

AFPD 16-10, *Modeling and Simulation*, 23 January 2015

AFI 16-1001, *Verification, Validation, and Accreditation (VV&A)*, 1 June 1996

AFI 33-115, *Air Force Information Technology (IT) Service Management*, 16 September 2014

AFI 33-360, *Publications and Forms Management*, 1 December 2015

AFI 33-401, *Air Force Architecting*, 17 May 2011

AFI 63-101/20-101, *Integrated Life Cycle Management*, 7 March 2013

AFI 99-103, *Capabilities-Based Test and Evaluation*, 16 October 2013

AFMAN 33-363, *Management of Records*, 1 March 2008, Incorporating Change 1, 28 January 2015

Adopted Forms

AF Form 847, *Recommendation for Change of Publication*

Abbreviations and Acronyms

ACS—Assistant Chief of Staff

ADS—Authoritative Data Source

AF—Air Force

AFI—Air Force Instruction

AFMAN—Air Force Manual

AFPD—Air Force Policy Directive

CoC—Council of Colonels

DCS—Deputy Chief of Staff

DIE—Defense Intelligence Enterprise
DoD—Department of Defense
ESG—Executive Steering Group
LVC-OT—Live, Virtual, and Constructive Operational Training
M&S—Modeling and Simulation
MAJCOM— Major Command
MSEA—Modeling and Simulation Executive Agent
ODNI—Office of the Director of National Intelligence
SAP—Special Access Program
SAR—Special Access Required
VV&A—Verification, Validation, and Accreditation

Terms

Accreditation—The official certification that a model or simulation and its associated data are acceptable for use for a specific purpose. (DoDI 5000.61)

Authoritative Data Source—A recognized or official data production source with a designated mission statement or source/product to publish reliable and accurate data for subsequent use by customers. An authoritative data source may be the functional combination of multiple, separate data sources. (DoDD 8320.03).

Constructive Simulation—Simulations involving simulated people operating simulated systems. Real people can be allowed to stimulate (make inputs) to such simulations. (M&S Glossary)

Data asset—Any entity that is comprised of data. For example, a database is a data asset that is comprised of data records. A data asset may be a system or application output file, database, document, or web page. A data asset also includes a service that may be provided to access data from an application. For example, a service that returns individual records from a database would be a data asset. Similarly, a web site that returns data in response to specific queries (e.g., www.weather.com) would be a data asset. A human, system, or application may create a data asset. (DoDD 8320.02)

Discovery metadata—A type of metadata that describes or summarizes key attributes and concepts, and allows assets (e.g., a model, simulation, or data) to be found using enterprise-level search capabilities. (DoDI 5000.70).

DoD M&S discovery metadata search capability—An enterprise-level capability that enables the discovery of metadata about M&S assets to facilitate visibility into the resources available across the DoD and within other Federal and non-Federal agencies engaged in M&S, and federated with DoD M&S. Sources of the M&S assets described by the discovery metadata are maintained by DoD Components and other authoritative data and software repositories. Visibility into the discovery metadata enables a user or developer of M&S assets to identify potential reuse opportunities relative to their requirements. (DoDI 5000.70).

Interoperability—The ability of a model or simulation to provide services to and accept services from other models and simulations, and to use these exchanged services to operate effectively together. (SISO-REF-002-1999)

Key M&S asset—An M&S tool, data set, or service, including models, simulations, or data assets, that either exceeds \$5M in annual expenditures, or is less than \$5M but determined by the DoD Component to be “key.” The total annual expenditure will be determined using standard justification documentation for DoD appropriations, such as RDT&E (R-docs), Procurement (P-docs), and O&M (O&M exhibits), which are provided to Congress pursuant to DoD 7000.14-R. (DoDI 5000.70)

Legacy Model—1. Any model or simulation that was developed either in the past or for a different purpose. (M&S Glossary) 2. For the purposes of this instruction, a model developed in the past which is still in use that was not implemented using today’s standards (e.g., software, communication, etc.). Some legacy models have been modified with interfaces to some of the current standards extending their usefulness and interoperability with newer, standards based models.

Live simulation—A simulation involving real people operating real systems. (DoD M&S Human Capital Strategy)

Modeling and Simulation (M&S)—1. The discipline that comprises the development and/or use of models and simulations. (DoDD 5000.59, DoDI 5000.61) 2. The use of models, including emulators, prototypes, simulators, and stimulators, either statically or over time, to develop data as a basis for making managerial or technical decisions. The terms "modeling" and "simulation" are often used interchangeably.

M&S assets—M&S tools, data, and services, including models and simulations, and data assets. (DoDI 5000.70).

M&S data—Data used to develop models or simulations, data used as input to models and simulations, and data produced by models and simulations. (DoDI 5000.70)

M&S Executive Agents (MSEA)—DoD MSEAs are designated by the Under Secretary of Defense for Acquisition, Technology, and Logistics to serve as domain SMEs for the M&S community. Their roles are to provide timely and authoritative representations of the natural environment and systems, and to establish V&V procedures for common and general-use M&S representations and their data. The DoD MSEAs are sources of valid M&S data.

M&S services—An activity that enhances the ability to effectively and efficiently use M&S to accomplish a mission. Examples include M&S standards development and promulgation, interoperability, Verification, Validation, and Accreditation (VV&A) process development, and workforce development. (DoDI 5000.70)

M&S tools—Software that implements a model or simulation or an adjunct tool, i.e., software and/or hardware that is either used to provide part of a simulation environment (e.g., to manage the execution of the environment) or to transform and manage data used by or produced by a model or simulation. Adjunct tools are differentiated from simulation software in that they do not provide a virtual or constructive representation as part of a simulation environment. (DoDD 5000.59)

Metadata—Searchable information describing the characteristics of data; data or information about data; or descriptive information about an object's data, data activities, systems, and holdings. For example, metadata for a model or simulation will include keywords and a description of the capabilities along with developer and user information. (DoDI 5000.70)

Model—A physical, mathematical, or otherwise logical representation of a system, entity, phenomenon, or process.

Operational Training—Operational training is mission-oriented training in support of warfighter readiness. It is a crucial element of all the AF Service Core Functions. It distinguishes itself from basic/initial training due to its focus on employment of equipment/skills in an operational setting as opposed to learning the basic use of equipment or development of basic skills.

Operational Testing—A generic term encompassing the entire spectrum of operationally oriented test activities, including assessments, tests, and evaluations. Not a preferred term due to its lack of specificity. Reference AFI 99-103 for additional detail.

Reuse—The practice of using again, in whole or part, existing M&S tools, data, or services.

Simulation—A method for implementing a model over time. Simulations are typically described as live, virtual, constructive, or a combination, depending on the application. (DoDD 5000.59)

Virtual Simulation—A simulation involving real people operating simulated systems. Virtual simulations inject human-in-the-loop in a central role by exercising motor control skills (e.g., flying an airplane), decision skills (e.g., committing fire control resources to action), or communication skills (e.g., as members of a Command, Control, Intelligence, Surveillance, and Reconnaissance (C2ISR) team).