

**3 MAY 2004**



**Operations Support**

**MODELING AND SIMULATION (M&S)  
MANAGEMENT**

**COMPLIANCE WITH THIS PUBLICATION IS MANDATORY**

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OPR: XPY (Ms. Patty O'Brien)  
Supersedes AFSPCI 16-101, 2 Feb 98.

Certified by: XPY (Col William P. Doyle)  
Pages: 16  
Distribution: F

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This instruction implements AFD 16-10, *Modeling and Simulation (M&S) Management*, within Air Force Space Command (AFSPC). It provides guidance on the management of M&S to support military space operations, and the development of plans, capabilities and concepts of operations. Units are authorized to publish supplements. It applies to Air Force Reserve Command (AFRC) and Air National Guard (ANG) units gained to AFSPC. The reporting requirements in this publication are exempt from licensing in accordance with AFI 33-324, *The Information Collections and Reports Management Program; Controlling Internal, Public, and Interagency Air Force Information Collections*.

**SUMMARY OF REVISIONS**

**This document is substantially revised and must be completely reviewed.**

The revision includes organizational changes and defines M&S area leads to manage the domains of capabilities, training, intelligence support and analysis M&S across the Command. The changes are based on the stand up of a new analysis organization, HQ AFSPC/XPY, the merger of Space and Missile Systems Center (SMC) to AFSPC, and changes in AF M&S policy. The management of AFSPC studies and analyses has been removed from this instruction to focus on the management of models and simulations. The AFSPC M&S Toolkit is defined, as well as, procedures for identifying and submitting common-use M&S needs.

**1. Purpose.** M&S applications support AFSPC processes to train, organize, and equip military space and missile forces. M&S also supports the development of plans, capabilities, and concepts of operations for the Air Force and DoD. Hence, it is critical that M&S throughout the DoD must be accurate enough to produce unbiased and realistic results for decision-making. The instruction guides the AFSPC M&S investment strategy to develop and maintain credible representations of space and missile systems, concepts and operations. The representations not only demonstrate the military worth of space capabilities, but also serve as a common language between military operations and engineering communities of prac-

tice in a collaborative architecture design of “Mission Systems”. AFSPC has an interest in ensuring that the joint simulation environment and Simulation Based Acquisition practices incorporate valid representations of space and missile operations, to include foreign, commercial and AFSPC materiel assets, as well as, the associated Concept of Operations (CONOPS), needed to obtain full value in the Effects Based Operations (EBO) concept of military transformation. The instruction describes the process and organizational responsibilities that enable AFSPC to ensure adequate representation of space and missile operations in constructive, virtual and synthetic models and simulations. The instruction designates M&S area leads, as focal points for AFSPC M&S needs and advocates for space representation in AF and OSD simulations. It establishes a process to manage an AFSPC M&S toolkit as the foundation for integrating space models into current AF and DoD simulations. The desired end state is a robust M&S capability that represents military space capabilities with comparable fidelity to representations for land, sea, and air warfare.

## 2. Responsibilities:

### 2.1. Plans and Programs (HQ AFSPC/XP):

#### 2.1.1. Director, Plans and Programs:

2.1.1.1. Represents M&S policy and strategy to external organizations to include HQ USAF/XIW, AF Studies and Analysis Agency (AFSAA), and the AF M&S General Officer Steering Group (GOSG). Participates in the AF M&S GOSG to promote appropriate representation of space power and doctrine in AF and joint M&S.

2.1.1.2. Advocates M&S planning, programming, budgeting, and execution (PPBE) positions on joint space and missile M&S issues with USSTRATCOM, Space and Missile Defense Battle Lab (SMDBL), National Reconnaissance Office (NRO), and Naval Network and Space Operations Command (NNSOC). Coordinates efforts with Defense Modeling and Simulation Office (DMSO), Joint Forces Command Joint Warfighting Center (JFCOM/JWFC) and the Air Reserve Component (ARC).

2.1.1.3. Coordinates AFSPC M&S requirements with the NRO and where appropriate leverages AFSPC M&S investments with NRO M&S investments.

2.1.1.4. Addresses M&S investments as a specific program objective management (POM) issue. Requests M&S updates from the Space Warfare Center (SWC), the SMC, the Air Force Research Laboratory (AFRL), and the ARC to support POM reviews. Develops a programming strategy for cross-cutting M&S investments and the maintenance of the AFSPC M&S Toolkit.

#### 2.1.2. Space Analysis Division (HQ AFSPC/XPY) :

2.1.2.1. Collects, consolidates, and advocates for common-use M&S requirements across the Command, as the AFSPC M&S Lead. Chairs the AFSPC M&S Board to establish command-wide priorities. Advocates for solutions to command-wide M&S needs in the AFSPC corporate process. **Attachment 2** summarizes the process for submitting M&S needs and requirements.

2.1.2.1.1. Advocates AFSPC M&S requirements (Distributed Product Descriptions (DPDs), threat models, data, and environments) to Air Force Materiel Command (AFMC) for consolidation and prioritization with AF M&S infrastructure requirements for science

and technology (S&T), acquisition, and test and evaluation (T&E).

2.1.2.1.2. Serves as the focal point for authoritative space and missile system representations and data sources. Interfaces with appropriate AF M&S organizations and maintains authoritative data sources for representations of AFSPC assets, force structure, and threats to AFSPC systems to include DPDs, Multi-Service Force Deployment (MSFD), future space order of battle, and major scenarios required to operate AF and DoD models and simulations.

2.1.2.1.3. Represents AFSPC M&S requirements to the AF Modeling and Simulation Architecture Council (MSAC). Coordinates with HQ USAF/XIWM on major M&S programs and architectures. Provides consolidated quarterly reports to HQ USAF/XIWM and the analytic space M&S user community on the AFSPC M&S Toolkit.

2.1.2.1.4. Works with the model proponents to ensure consistency in the life-cycle management for the AFSPC M&S Toolkit.

2.1.2.1.5. Maintains AFSPC-wide M&S deficiencies for the M&S Board.

2.1.2.2. Provides policy and guidance for the development of the AFSPC M&S Toolkit.

2.1.2.2.1. Advocates M&S standards and life cycle management of the AFSPC M&S Toolkit. Develops retention and transition plans for the toolkit. Advocates toolkit maintenance to include resources for configuration management, accreditation support, user support, training, and model enhancements.

2.1.2.2.2. Advocates changes to the AF M&S Training Toolkit (AFMSTT) and the AF Standard Analysis Toolkit (AFSAT) based on improvements in the AFSPC M&S Toolkit.

2.1.2.2.3. Develops guidelines for and coordinates on the release of AFSPC-sponsored models and simulations to external organizations by AFSPC model proponents.

2.1.2.2.4. Prepares the AFSPC M&S strategy documenting AFSPC M&S applications and investment plans to address AFSPC common-use M&S needs.

2.1.2.3. Serves as the M&S area lead for analysis. Consolidates M&S needs for AFSPC military utility analyses supporting CONOPS development, requirements generation, modernization planning and strategic planning. Reviews and validates requested changes to the AFSPC M&S Toolkit to support analysis. Manages the interactive and collaborative process linking space operations effects to acquisition solutions.

2.1.2.3.1. Serves as the AFSPC office of primary responsibility (OPR) for space representation in the AFSAT. Provides M&S expertise, supporting development and validation of AF and joint campaign and mission analytic tool development.

2.1.2.3.2. Maintains a repository of AFSPC M&S applications supporting studies and analyses. Provides summary information on M&S applications to the Air Force Modeling and Simulation Resource Repository (AFMSRR) and AFSAA. Serves as the command's AFMSRR Resource Coordinator.

2.1.2.3.3. Reports M&S deficiencies for analysis and progress to the AFSPC M&S Board. Coordinates with AFSAA on AFSPC analytic M&S needs. Represents AFSPC at the Air Force Analytic Community (AFAC) Steering Group.

2.1.2.3.4. Coordinates with AFSPC model proponents for analytic tools to ensure verification and validation (V&V) programs support AFSPC accreditation decisions.

2.1.2.4. As the OPR for the accreditation process within AFSPC, HQ AFSPC/XPY reviews verification, validation, and accreditation (VV&A) plans for models and simulations supporting AFSPC decisions and provides recommendations to the appropriate accreditation authority.

2.1.2.4.1. Ensures AFSPC M&S applications are in accordance with AFI 16-1001, *Verification, Validation, and Accreditation (VV&A)* guidance.

2.1.2.4.2. Reports progress and discrepancies in V&V of the AFSPC M&S Toolkit to the AFSPC M&S Board.

2.1.2.5. Maintains the astrodynamic standards for AFSPC in accordance with AFSPCI 60-102, *Space Surveillance Astrodynamic Standards* and establishes minimum standards required for astrodynamic systems interoperability.

## 2.2. Requirements (HQ AFSPC/DR):

2.2.1. HQ AFSPC/DR serves as the M&S area lead for capabilities documents and consolidates M&S needs supporting the Joint Capabilities and Integrated Development System (JCIDS) process.

2.2.2. Facilitates the technical review of space and missile models and simulations. Provides subject matter experts to support the validation of the AFSPC M&S Toolkit and the accreditation of M&S used in Analysis of Alternatives (AoAs), capabilities assessments, and major acquisition decisions.

## 2.3. Space and Missile Systems Center (SMC):

2.3.1. SMC/TD is the AFSPC OPR for all M&S tools used for acquisition and development. SMC/TD consolidates AFSPC recommendations for changes to AFI 16-1002, *Modeling and Simulation (M&S) Support to Acquisition*, for approval by HQ AFSPC/XP and in support of the annual AF review.

2.3.1.1. SMC/AX, in consultation with SMC/TD, monitors advancements in cost modeling methods for complex space systems and determines deficiencies, which are provided to HQ AFSPC/XP and the AFSPC M&S Board.

2.3.1.2. SMC/AX assures compatibility of AFSPC M&S capabilities with other OSD and Joint warfare applications.

2.3.1.3. SMC/TD with SMC/AX assists system program managers in developing the modeling and simulation support plans (MSSPs) and in identifying M&S requirements for the full life cycle of the system. Maintains a repository of AFSPC M&S applications supporting major acquisition decisions. Provides summary information on M&S applications to the AFMSRR.

2.3.2. SMC/TD supports the development and M&S technologies transition of models from acquisition to operations. Promotes the reuse of models and simulations across AFSPC. Develops model modification plans to support reuse or retention. Identifies M&S deficiencies impacting multiple system program offices to HQ AFSPC/XPY, as recommended common-use model needs.

2.3.2.1. SMC/TD and AFSPC system program offices maintain the M&S strategies for each

SMC program office/system acquisition. Together they identify M&S tools and data developed in support of acquisition that would benefit the operations community (training, exercises, wargames, experiments, mission rehearsal, and decision support). SMC provides an annual update to HQ AFSPC/XPY on the status of the MSSPs developed by product centers and SMC program offices.

2.3.2.2. SMC/AX, in consultation with SMC/TD, provides resource requirements to HQ AFSPC/XP for accomplishing AF M&S master planning and reports deficiencies to the AFSPC M&S Board. SMC/AXL is the focal point for M&S requirements for the Distributed Mission Operations for space (DMO-S) and coordinates with HQ AFSPC/XOTT on DMO training plans.

2.3.2.3. SMC/TD manages and/or performs verification and validation testing of development solutions consistent with AFSPC needs under **paragraph 2.1.2.2.**

2.3.3. SMC/TD reviews all AFSPC Capabilities Documents, and reports M&S deficiencies to HQ AFSPC/XPY, as needed.

2.3.3.1. SMC/TD develops plans and directs integration of M&S tools to ensure adequate and integral representation of space capabilities in acquisition, analysis, wargames, exercises, and experimentation efforts, including the Joint Synthetic Battlespace (JSB), and the Joint Distributed Engineering Plant (JDEP).

#### **2.4. Operations (HQ AFSPC/XO):**

2.4.1. HQ AFSPC/XOT serves as the M&S area lead for training and DMO-S needs. Prioritizes M&S needs for training, exercises/contingency operations, experiments and wargames. Validates requested changes to the AFSPC M&S Toolkit. Reports M&S deficiencies and progress to the AFSPC M&S Board.

2.4.1.1. Ensures M&S users report M&S deficiencies observed in exercises/contingency operations, experiments and wargames through the Joint Universal Lessons Learned System (JULLS).

2.4.1.2. Deficiencies and recommended improvements in M&S tools, which support space training, will be forwarded to HQ AFSPC/XOTT for validation and prioritization. Coordinates with SWC/XI on M&S deficiencies and on the development of an MSSP.

#### **2.5. Space Warfare Center (SWC):**

2.5.1. SWC/XI is the OPR for AFSPC M&S support to exercise training, experiments, and wargames. Leads model development and integration of space models to ensure adequate representation of space and missile operations for AFSPC, AF and joint training exercises, experiments, and wargames. Supports the validation of space models and simulations. Serves as the AFSPC OPR for the AFMSTT.

2.5.1.1. In coordination with HQ AFSPC/XOT ensures appropriate use of M&S to represent AFSPC capabilities, including ARC-gained units, at training exercises and Title 10 wargames. Provides M&S expertise and technical planning for M&S support.

2.5.1.2. Reports M&S deficiencies to HQ AFSPC/XOT and HQ AFSPC/XPY, and recommends plans for improving space and missile representations.

2.5.1.3. Coordinates with Air Force Agency for Modeling and Simulation (AFAMS) to implement space representation improvements in the AFMSTT. Supports validation of space representation in the AFMSTT and joint training simulation environment.

2.5.1.4. Maintains a repository of AFSPC M&S applications supporting training exercises, experiments, and wargames. Provides summary information on M&S applications to the AFMSRR.

2.5.1.5. Maintains a V&V repository of AFSPC wargaming tools to support AFSPC accreditation. Develops V&V plans to maintain credibility of future releases.

2.5.2. SWC/XI serves as the AFSPC model proponent for AFSPC exercise training, wargaming, and experiment tools.

2.5.2.1. Identifies M&S deficiencies to HQ AFSPC/XOT and develops the MSSP for AFSPC support to training exercises, experiments, and wargames.

2.5.2.2. Develops solutions to M&S deficiencies as part of the AFSPC M&S Toolkit. Ensures the solutions consider AF and joint M&S architectures and support integration with the joint training simulation environment.

2.5.2.3. Implements V&V programs and coordinates V&V requirements with the other model proponents for AFSPC M&S Toolkit to support accreditation for use by AFSPC in training exercises, experiments, and wargames.

2.5.2.4. Coordinates with SMC/TD on JSB requirements for training, wargaming, and experimentation.

2.5.3. SWC/XI manages the space hub for virtual space simulation of AFSPC capabilities supporting AF and joint training exercises. Develops distributed support in conjunction with other AF simulation centers.

## 2.6. Intelligence (HQ AFSPC/IN):

2.6.1. Through HQ AFSPC/INX and the intelligence offices of AFSPC subordinate units, HQ AFSPC/IN provides leadership, coordination and oversight of intelligence support to all Command M&S activities.

2.6.2. Ensures M&S users have authoritative representations of US intelligence, surveillance, and reconnaissance (ISR) processes and of foreign forces, systems, processes, entities, and behavior in models and simulations. Assists M&S users in accrediting these representations.

2.6.3. Determines M&S user requirements for scenarios, threat data or models, and operational or tactical intelligence. Assesses HQ AFSPC/IN capabilities to satisfy these requirements and, as needed, requests and monitors intelligence production through the DoD Intelligence Production Program (DoDIPP).

2.6.4. Assists HQ AFSPC/XPY in planning for intelligence support to future M&S capabilities.

2.6.5. Assists the M&S user in evaluating and selecting appropriate scenarios based upon the user's requirements and the most current intelligence and other scenario data available for M&S.

2.6.6. In conjunction with AFC2ISRC and HQ USAF/XOI, documents requirements and resource shortfalls associated with threats and scenarios for M&S, and works with the appropriate offices to alleviate shortfalls.

2.6.7. Represents HQ AFSPC at intelligence community meetings and other intelligence planning meetings and advocates for scenario development that will satisfy AFSPC M&S requirements.

2.6.8. Reviews M&S threat data for currency and accuracy, documents sources of threat data, and when appropriate, requests validation of threat data and scenarios.

### 2.7. **Financial Management (HQ AFSPC/FM):**

2.7.1. Assists HQ AFSPC/XPY in determining funding sources to support improvements and maintenance of the AFSPC M&S Toolkit. In conjunction with HQ AFSPC/XPY and the Program Element Monitors (PEMs), develops a financial plan and budget execution strategy.

### 2.8. **AF Research Laboratory (AFRL):**

2.8.1. Provides M&S of future space and missile capabilities to support analyses, acquisition, wargames, and experiments. Provides M&S of future space asset performance required to calibrate mission and campaign representations of space and missile systems.

2.8.2. Provides space environment models and simulations to support vulnerability assessments, and characterize operating performance parameters.

2.8.3. Develops interfaces for space and missile models to support integration with the joint simulation environment in support of experimentation, testing, concept exploration, and research and development.

2.8.4. Reports M&S deficiencies and opportunities to advance M&S technologies and architectures to the science and technology group.

## 3. **Procedures:**

3.1. **Oversight and advocacy of common-use M&S needs.** The HQ AFSPC/XPY manages AFSPC-sponsored applications of models and simulations, and monitors key AF and DoD M&S applications that include representations of space and missile capabilities.

3.1.1. The AFSPC Vice Commander presents critical space M&S issues and progress in meeting AF M&S objectives in a semi-annual meeting of the AF M&S Caucus, as required. The HQ USAF/XI represents Air Force M&S solutions and positions into DoD Executive Council for Modeling and Simulation (EXCIMS).

3.1.2. HQ AFSPC/XP advocates AF investments to support full integration of space capabilities in AF and DoD M&S applications at the semi-annual AF M&S GOSG.

3.1.3. HQ AFSPC/XPY organizes the AFSPC M&S Board to assess progress in meeting AFSPC M&S objectives and coordinate M&S issues with AFSPC M&S area leads and OPRs. Presents recommended AFSPC positions for critical M&S issues to the command staff in support of AFSPC POM development, financial plan and execution year budget reviews.

3.1.4. The M&S area leads validate and prioritize needs for their domains across the command. They review and validate changes to the AFSPC M&S Toolkit. The M&S area leads provide assessments of M&S needs and recent progress to the AFSPC M&S Board.

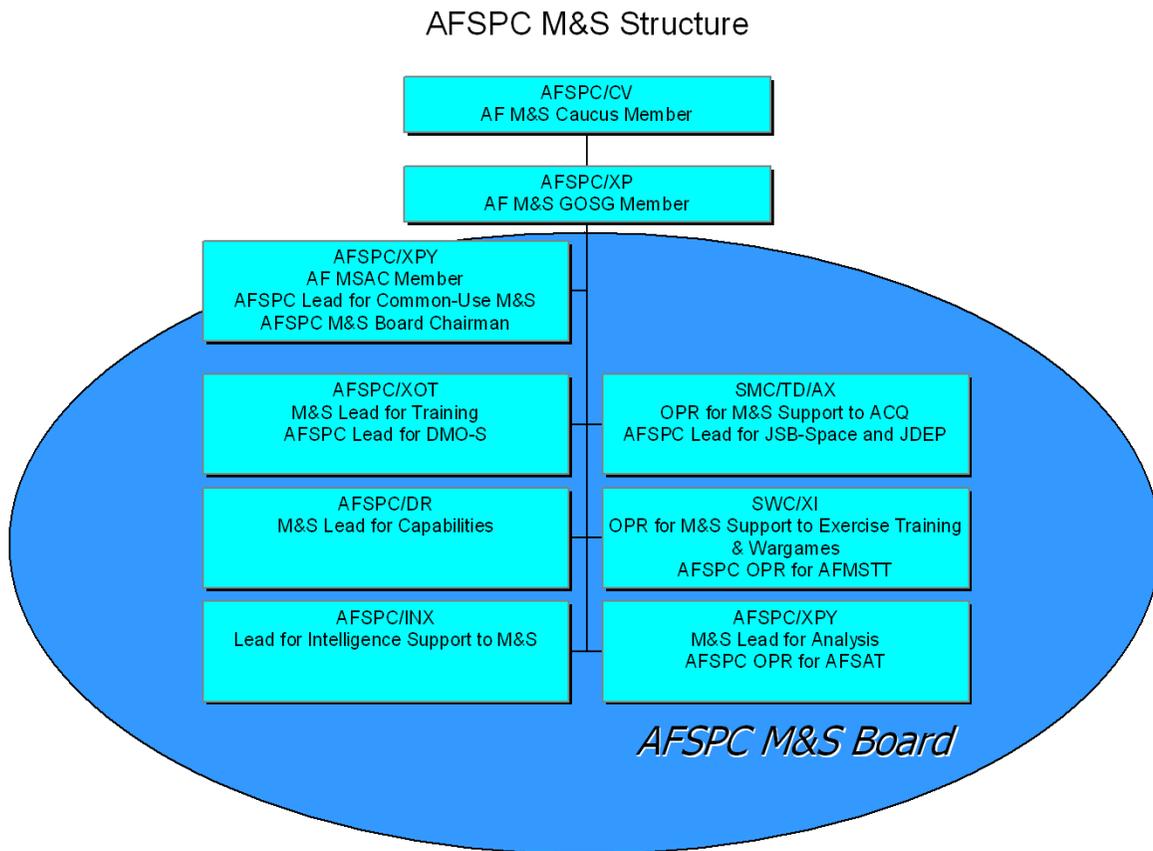
3.1.5. HQ AFSPC/XPY represents AFSPC M&S requirements at the AF Capabilities/ Requirements Review Board (CRRB) led by AFAMS to recommend AF or DOD support.

**3.2. AFSPC M&S Toolkit Management.** AFSPC supports an AFSPC M&S Toolkit through a program of AFSPC M&S investments, the development of AFSPC common-use M&S needs, and designation of M&S area leads. The toolkit consists of M&S applications for which an AFSPC organization is the AF model proponent or the application sponsor. **Attachment 3** describes the guidelines for the toolkit management.

3.2.1. Requests for changes to the toolkit will be submitted to HQ AFSPC/XPY and reviewed by the M&S area lead prior to presentation to the AFSPC M&S Board. Requests will be reviewed quarterly to ensure the Command's expenditure of M&S resources is aligned with overall AFSPC needs.

3.2.2. Requests for an AFSPC model proponent will be submitted to HQ AFSPC/XPY by the M&S area leads. The request will describe AFSPC's interest and responsibilities in managing the development of the model or simulation for use by AFSPC, AF or DoD. HQ AFSPC/XPY will coordinate the request with all M&S area leads and the M&S OPRs. HQ AFSPC/XPY presents a recommendation for the expansion, modification, retirement or replacement in the AFSPC M&S Toolkit to the AFSPC M&S Board.

Figure 1. M&S Responsibilities.



3.2.3. HQ AFSPC/XPY maintains a catalog of model descriptions for the AFSPC M&S Toolkit, applications of AFSPC-sponsored M&S, and data sources for those applications. The information is accessible from the AF MSRR web page, <http://afmsrr.afams.af.mil/>.

3.2.4. AFSPC model proponents will submit an MSSP to HQ AFSPC/XPY through the appropriate M&S area lead. Programming disconnects required to meet the AFSPC M&S Toolkit guidelines will be reported to the HQ AFSPC/XPY for consolidation prior to POM submission.

**3.3. AFSPC M&S Intelligence Support.** HQ AFSPC/IN maintains oversight of intelligence support to all M&S efforts in the Command. The goal of HQ AFSPC/IN oversight is to ensure M&S users have accurate, authoritative representations of US ISR processes and of foreign forces, systems, processes, and entities in all AFSPC models and simulations. The type of support required varies with the purpose of the M&S application but normally includes some combination of scenarios, threat data or models, and operational or tactical intelligence.

3.3.1. In all cases, the first step to obtaining intelligence support for M&S is to articulate known intelligence requirements to the supporting intelligence office. Within HQ AFSPC, HQ AFSPC/INF is responsible for coordinating intelligence support to HQ participation in training exercises and wargames. HQ AFSPC/INX normally supports M&S for acquisition or analysis. Similarly

SMC/IN and SWC/XI would respond to intelligence requirements from SMC and SWC, respectively.

3.3.2. The supporting intelligence office will analyze the requirements and determine how best to support them. This involves determining what resources (scenarios, threat data/models, personnel, funding, and time) might already be available to satisfy the requirement.

3.3.3. If resources are insufficient or unavailable, the supporting intelligence office will submit a production requirement through DoDIPP and coordinate directly with appropriate intelligence production center for a solution.

3.3.4. At every opportunity, HQ AFSPC/IN will advocate for the development of scenarios and threat data/models that could be useful in future AFSPC M&S applications.

#### **4. Reports:**

4.1. HQ AFSPC/XPY prepares the annual AFSPC M&S Strategy to support the Air Force M&S Strategic Plan and Investment Plan. The strategy addresses integration of space M&S with the AF M&S Architectures. HQ AFSPC/XP approves the AFSPC M&S Strategy.

4.2. HQ AFSPC/XPY provides an annual report to HQ AFSPC/XP and the AFSPC M&S Board on accreditation plans and VV&A activities in support of AFSPC-sponsored M&S applications including activities conducted by AFSPC program offices for acquisition.

4.3. HQ AFSPC/XOT provides an update on M&S deficiencies to support space operator training and M&S needs to improve warfighter understanding of space and missile operations to the AFSPC M&S Board.

4.4. SWC/XI provides an annual update to the MSSP on the development of M&S tools to support experiments, joint training, and AF computer-aided exercises and wargames to the AFSPC M&S Board through HQ AFSPC/XOT.

4.5. SMC/TD provides an annual progress report on the development of common-use space M&S programs and development of the space portion of the JSB/JDEP to the AFSPC M&S Board.

4.6. HQ AFSPC/XPY prepares an annual assessment for USSTRATCOM of space and missile representations in AF and joint M&S. This stakeholder's report reviews recent M&S activities, AFSPC investments in the AFSPC M&S Toolkit, and future plans. The AFSPC Vice Commander releases the report.

4.7. HQ AFSPC/INX will provide a report to HQ AFSPC/XP and the M&S Board, when requested, on the status of intelligence support to AFSPC M&S capabilities.

ROOSEVELT MERCER, JR., Brig Gen, USAF  
Director of Plans and Programs

## Attachment 1

## GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION

*References*

DoDD 5000.59, *DoD Modeling and Simulation (M&S) Management*, Change 1

DoDI 5000.61, *DoD Modeling and Simulation (M&S) Verification, Validation, and Accreditation (VV&A)*

DoDD 8000.1, *Defense Information Management (IM) Program*

AFI 10-204 AFSPCSUP1, *Participation in the Military Exercise Program*

AFI 10-230, *Conduct of Key Exercises and Experiments*

AFI 10-230 AFSPCSUP1, *Participation in Key Exercises and Wargames*

AFI 10-601, *Mission Needs and Operational Requirements Guidance and Procedures*

AFI 14-201, *Intelligence Products and Applications*

AFI 14-206, *Modeling and Simulation*

AFPD 16-10, *Modeling and Simulation Management*

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

AFI 16-1002, *Modeling and Simulation (M&S) Support to Acquisition*

AFI 16-1003, *Modeling and Simulation Support to Test and Evaluation*

AFSPCI 33-105, *Distribution of AFSPC Software to Outside Organizations*

AFSPCI 60-102, *Space Surveillance Astrodynamic Standards*

AFSPCI 61-101, *Prioritization, Guidance, and Oversight of Space Science and Technology*

**Defense Intelligence Agency (DIA) Concept of Operations (CONOPS) for Defense Modeling and Simulation (M&S)**

***DMSO VV&A Recommended Practices Guide (RPG)***, <http://vva.dmsomil/>

*Abbreviations and Acronyms*

**AFAC**—Air Force Analytic Community

**AFAMS**—Air Forces Agency for Modeling and Simulation

**AFC2ISRC**—Air Force Command and Control, Intelligence, Surveillance, and Reconnaissance Center

**AFMC**—Air Force Materiel Command

**AFMSRR**—Air Force Modeling and Simulation Resource Repository

**AFMSTT**—Air Force Modeling and Simulation Training Toolkit

**AFRC**—Air Force Reserve Command

**AFRL**—Air Force Research Laboratory

**AFSAA**—Air Force Studies and Analysis Agency

**AFSAT**—Air Force Standard Analysis Toolkit

**AFSPC**—Air Force Space Command

**ANG**—Air National Guard

**AoA**—Analysis of Alternatives

**ARC**—Air Reserve Component

**CONOPS**—Concept of Operations

**CRRB**—Capabilities/Requirements Review Board

**DATSD[CBD]**—Deputy Assistant to the Secretary of Defense for Chemical and Biological Defense Programs

**DIA**—Defense Intelligence Agency

**DTRA**—Defense Threat Reduction Agency

**DMO-S**—Distributed Mission Operations for Space

**DMSO**—Defense Modeling and Simulation Office

**DoDIPP**—Department of Defense Intelligence Production Program

**DPD**—Distributed Product Descriptions

**EBO**—Effects Based Operations

**EXCIMS**—Executive Council for Modeling and Simulation

**GIANT**—GPS Interference and Navigation Tool

**GOSG**—General Officer Steering Group

**ISR**—Intelligence, surveillance, and reconnaissance

**JCIDS**—Joint Capabilities and Integrated Development System

**JDEP**—Joint Distributed Engineering Plant

**JFCOM/JWFC**—Joint Forces Command/Joint Warfighting Center

**JSB**—Joint Synthetic Battlespace

**JULLS**—Joint Universal Lessons Learned System

**M&S**—Modeling and Simulation

**MOU**—Memorandum of Understanding

**MSAC**—Modeling and Simulation Architecture Council

**MSEA**—Modeling and Simulation Executive Agent

**MSFD**—Multi-Service Force Deployment

**MSRR**—Modeling and Simulation Resource Repository

**MSSP**—Modeling and Simulation Support Plan

**NNSOC**—Naval Network and Space Operations Command

**NRO**—National Reconnaissance Office

**OPR**—Office of Primary Responsibility

**PEM**—Program Element Monitor

**PMD**—Program Management Directive

**POM**—Program Objective Memorandum

**PPBE**—Planning, Programming, Budgeting, and Execution

**S&T**—Science and Technology

**SEAS**—System Effectiveness Analysis Simulation

**SMAT**—Satellite and Missile Analysis Tool

**SMC**—Space and Missile Systems Center

**SMDBL**—Space and Missile Defense Battle Lab

**SWC**—Space Warfare Center

**T&E**—Test and Evaluation

**V&V**—Verification and Validation

**VV&A**—Verification, Validation, and Accreditation

### *Terms*

**Accreditation Authority**—The organization or individual responsible to approve the use of model, simulation, or federation of simulations for a particular application.

**Common-Use M&S**—M&S applications, services, or materials provided by a DoD component to two or more DoD Components.

**External M&S User**—An organization that does not take direction from or report to AFSPC/CC.

**Modeling and Simulation (M&S)**—The use of models and simulations, either statically or over time, to develop data as a basis for making managerial or technical decisions. This includes but is not limited to, emulators, prototypes, simulators, and stimulators.

**Modeling and Simulation Application Sponsor**—The AFSPC organization that accredits and uses the results or products from a specific application of a model or simulation.

**Modeling and Simulation Area Lead**—The AFSPC organization with primary responsibility for validating and prioritizing M&S needs for a specific functional area. The prioritization supports the management of the AFSPC M&S Toolkit and AFSPC M&S investment strategy.

**Modeling and Simulation Developer**—The individual, group or organization responsible for actually developing or modifying a simulation in accordance with a set of design requirements and specifications.

**Modeling and Simulation Program Manager**—The individual, group, or organization responsible for managing and overseeing the development, modification, maintenance, and configuration management of a model, simulation, or federation as directed by the user or sponsor.

**Model Proponent**—The AFSPC organization with primary responsibility to initiate development, configuration management, and life cycle management of the reference version of one or more models and/or simulations. The proponent is responsible for the V&V of the assigned M&S to include documentation.

**Modeling and Simulation Support Plan (MSSP)**—The planned implementation of models and simulations to support an acquisition program or functional area. The MSSP describes the planned activities to be supported by M&S, the toolset, data requirements, integration with other simulations, and planned improvements to the toolset. For acquisition programs, the MSSP covers the life cycle of the system. For other functional areas, the plan includes a 3-5 year schedule of activities and resource requirements.

**Modeling and Simulation OPR**—The AFSPC organization that manages technical solutions, develops MSSPs, or supports the integration of space models and simulations for a functional area.

**Subject Matter Expert**—An individual who, by virtue of position, education, training, or experience, is expected to have greater-than-normal expertise or insight relative to a particular technical or operational discipline, system, or process, and who has been selected or appointed to participate in the development, verification, validation, accreditation or use of a model or simulation.

## Attachment 2

### SUBMITTING M&S NEEDS AND REQUIREMENTS

**A2.1. Initial Request.** AFSPC M&S users may submit M&S needs to HQ AFSPC/XPY at any time. HQ AFSPC/XPY will support the submitter to ensure the information is complete for an initial review. HQ AFSPC/XPY will identify an M&S area lead for each submission. If current AFSPC-sponsored tools cannot meet the need, the M&S area lead may request a change to the AFSPC M&S Toolkit.

**A2.2. Review and Coordination.** A submission package will be generated that defines the need, impact to the Command, schedule and cost drivers, and a recommendation for resolving the need. The M&S area lead will incorporate the need into the M&S area consolidated list or explain why the need does not require an AFSPC-sponsored solution or AFSPC model proponent. The package will include coordination with the NRO, appropriate DoD Modeling and Simulation Executive Agents (MSEA), the Office of the Deputy Assistant to the Secretary of Defense for Chemical and Biological Defense Programs (DATSD [CBD]) on chemical-biological M&S, and the Defense Threat Reduction Agency (DTRA). The package will include a review of appropriate AF toolkits, search of the MSRRs, and may recommend an addition to one of the AF M&S toolkits.

**A2.3. Proposed Solutions.** Proposals for addressing the need may be developed by the submitter, an M&S area lead, an AFSPC model manager, or an AFSPC M&S OPR or model proponent. Multiple proposals may be submitted to address the need. When multiple proposals are provided, HQ AFSPC/XPY will coordinate the proposals with the M&S users and the M&S area lead. Each proposal must include an estimated cost and schedule.

**A2.4. AFSPC Model Proponent.** The M&S area lead may recommend a modification to the AFSPC M&S Toolkit. If a new tool is required, the submitter of the need must provide a resource plan and identify the model proponent within AFSPC.

**A2.5. AF or DOD Support.** HQ AFSPC/XPY will facilitate the development of model requirements and coordination with external model developers. If an existing AF or DoD M&S program can meet the need, an AFSPC M&S OPR will work with the program office. The OPR will prepare documentation appropriate to the M&S program and participate in program reviews or user forums. HQ AFSPC/XPY prepares inputs to the AF M&S investment plan or a space M&S issue presentation for AFSPC to address at the AF M&S forums.

**A2.6. Tracking.** Each need will be tracked by HQ AFSPC/XPY, forwarded to AFAMS for processing through the AF Capabilities/Requirements Review Board (CRRB), and reported in the stakeholder report. AFSPC-funded needs will be monitored by the M&S area leads. Needs that are not sponsored by AFSPC may be posted to the AFMSRR or DMSO for review by a wider community.

### Attachment 3

#### GUIDELINES FOR THE AFSPC M&S TOOLKIT

**A3.1. Toolkit Entry.** HQ AFSPC/XP approves models and simulations in the AFSPC M&S Toolkit. M&S area leads recommend each change. New tools must have an AFSPC model proponent, a model manager, a V&V program, a configuration management process, a life cycle management plan, and documentation to support the AFMSRR. HQ AFSPC/XPY assesses the relevance of the tool to the AFSPC M&S goals and objectives and recommends formal AFSPC-sponsorship and support.

**A3.2. Relationship to AF Toolkits.** AFSPC will support growth of the AF toolkits by first populating the AFSPC M&S Toolkit. HQ AFSPC/XPY sponsors changes to the AF toolkits to reflect changes in the AFSPC M&S Toolkit. AF currently recognizes the following AFSPC tools: the GPS Interference and Navigation Tool (GIANT), System Effectiveness Analysis Simulation (SEAS), and Satellite and Missile Analysis Tool (SMAT).

**A3.3. Model Proponent Requirements.** The AFSPC model proponent provides HQ AFSPC/XPY with documentation for the AFSPC-sponsored version of the tool and AFSPC applications. The following information will be updated on an annual basis or with each new software release in an MSSP:

A3.3.1. Description of the model capabilities, previous uses, a model development history, V&V report, and list of customers/users.

A3.3.2. Users' manual, users' support plan, and standard installation requirements.

A3.3.3. V&V plan, configuration management plan and life cycle management program (including AFSPC funding).

A3.3.4. Data sources/suppliers and related tools.

A3.3.5. **Distribution/Releasability Controls.** A standard Memorandum of Understanding (MOU) controlling the distribution to external M&S Users describes the release procedures for the model and data. The agreement specifies reasonable and intended use guidelines for the model and data IAW AFD 16-10.

**A3.4. Periodic Review.** On request of the HQ AFSPC/XP, the model sponsor will present a review of model development plans and integration with other AF and DOD initiatives. Periodically, the full toolkit will be reviewed to assess retention as AFSPC-sponsored tools and needs for transition or retirement of tools. The review may be based on changes to the AF or AFSPC M&S strategy or changes in funding for the AFSPC M&S Toolkit.