

M&S Standards Activities in NATO

NATO Modelling and Simulation Group (NMSG)

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NATO and National Challenges where M&S can contribute solutions

- Training
- Decision Support, Mission Planning, Mission Rehearsal
- Cyber operations
- Green Technology
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M&S Today

- Since 1990, M&S has become known not simply as an enabling technology but as a fundamental discipline;
- In 2005 the U.S. House of Representatives established the M&S Caucus and in 2007 they declared **M&S a "National Critical Technology"**.

Mid '90s – NATO recognized the importance of M&S in support to operations

NMSG's Mission

The **Mission** of the NATO Modelling and Simulation (M&S) Group (NMSG) is to **promote co-operation** among Alliance bodies, NATO Member Nations and Partner Nations to maximise the effective utilisation of M&S.

Primary mission areas include **M&S standardisation, education, and associated science and technology**. The Group will provide M&S expertise in support of the tasks and projects within the STO and from other NATO organisations.

M&S Fundamentals: Interoperability, Standardisation, Re-use, Security, V&V

NATO M&S Vision and Guiding Principles

- **Exploit M&S to its full potential across NATO and the Nations to enhance both operational effectiveness and cost effectiveness.**
- **Guiding Principles as Reflected in the NATO M&S Masterplan (NMSMP):**
 - Synergy
 - Interoperability
 - Reuse and Affordability

NMSMP Objectives

Objective 1

Establish a Common Technical Framework

Sub-objectives

- Develop NATO standard interoperability architecture and supporting material
- Establish recommended standards pertaining to data interchange for M&S and C2 systems, promotion of true interoperability, pursue trust in M&S
- Establish a NATO wide (incl. National Stakeholders) technical environment for distributed networked M&S application areas

Objective 2

Provide Coordination & Common Services

Sub-objectives

- Develop common process and procedures to guide actions and decisions regarding M&S application
- Compile M&S information
- Establish capability to share M&S education resources with NATO organizations and Alliance nations
- Promote the sharing of M&S resources through a knowledge management process and system
- Establish a help desk to facilitate the development and use of M&S

Objective 3

Develop Models & Simulations

Sub-objectives

- Identify and prioritize M&S requirements
- Identify the most effective strategies to satisfy each simulation requirement
- Allocate resources to satisfy the highest priority simulation requirements
- Execute the selected and resourced development strategy
- Provide information to the larger NATO community regarding the resultant simulations and any lessons learned during development

Objective 4

Employ Simulations

Sub-objectives

- Plan employment
- Provide resources to operate simulations
- Provide databases
- Operate simulations to improve all aspects of NATO/national military activities
- Conduct impact assessments and document lessons learned to guide further development / investments

Objective 5

Incorporate Technological Advances

Sub-objectives

- Monitor M&S related technological advances
- Conduct R&D, experiments and pilot projects as needed to support Alliance requirements
- Share information on realized advances to facilitate incorporation
- Implement technological advances

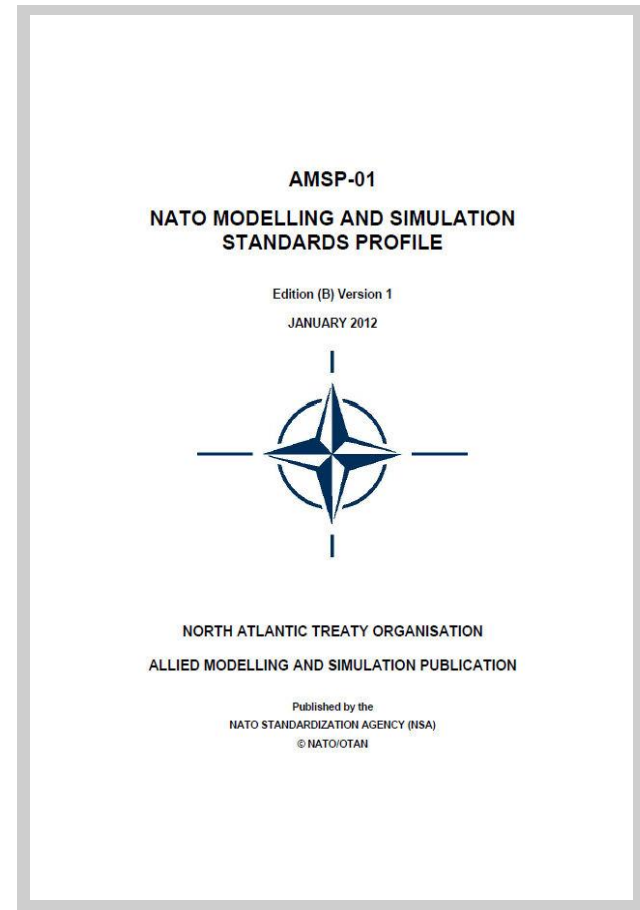
NMSG Specific Characteristics

- **Membership:**
 - Not only scientific / technical people (academia, governm., industry),
 - But also **Military** subject matter experts
- **Mission on M&S standards**
 - NMSG was designated as “Delegated Tasking Authority” for NATO M&S standardization by CNAD in 2003,
 - Work in close cooperation with SISO (Simulation Interoperability Standards Organization): a technical cooperation agreement was signed in 2007
- **These characteristics have significant impact on**
 - NMSG internal organization,
 - NMSG activities that are not only technical, but are very often related to an operational need

NMSG Activities - Highlights

NATO M&S Standards Profile

- The M&S standards profile is a so-called NATO “Allied Publication” (reference AMSP-01)
 - Identify standards of interests for NATO M&S;
 - **Include all relevant STANAGs and underpin mandatory use**
 - Advice on ‘good practice’ standards (and not impose);
 - Provide basic information on standards of interest;
 - Identify gaps and propose new initiatives



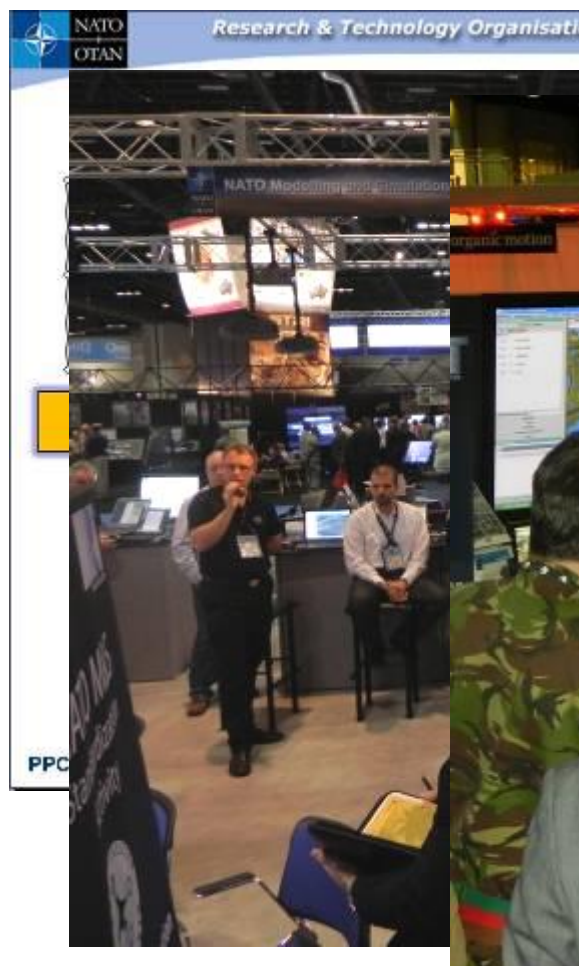
NATO M&S Glossary

- **The M&S Glossary is currently under development as AMSP-02**
 - Identify and align M&S related definitions
 - Provide information on terminology
 - Identify gaps and propose new initiatives

NATO M&S CAX Handbook

- **The M&S CAX handbook is currently under development as AMSP-03**
 - Identify and align existing documents
 - Provide information on preparation and execution of distributed multi-national CAX events
 - References to technical standards (e.g. MSG-068/MSG-106 NETN)
 - Governance of standards and procedures

NMSG Impact: MSG-068 Simulation Reference Architecture



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Viper 51 Meets Rattlesnake 4 In The Virtual World

"Viper 51 this is Rattlesnake 4, let me know when you clear the IP (Initial Point) for your run".
"Roger, Rattlesnake 4".

The pilot of Viper 51 was flying his F-16 at 300 knots just 200 feet off the ground with six 500-pound MK-82 high-drag bombs under his wings.

At this speed and altitude the trees blur into one green mass as he scans the terrain.

"Cleared IP." The Forward Air Controller (FAC) has only seconds to visually acquire the aircraft. One moment it will be a dot on the horizon and the next it will flash overhead.

Rattlesnake 4 has been a FAC for years and has many combat missions in ISAF. He takes one last look at the terrorist vehicles, checking also with the ROVER UAV feed to make sure they have not moved, and that there are not any non-combatants near.

"Tip up", calls Viper 51. The F-16 begins a pull up manoeuvre to gain altitude. As he levels out, he sees the targets as his aiming dot on his heads-up display creeps across the ground toward the vehicles.

"Rattlesnake 4, tally target"
"Viper 51, cleared hot"

Viper 51 barely gets his clearance to drop before leaving the target area. He drops the bombs as he pulls a high G turn to escape the weapon's fragmentation envelope. The explosion destroys all three vehicles; a successful high-threat low altitude target engagement.

This event did not occur in some far off land on a battlefield between two unnamed mountains. Instead, it took place all around Europe. The UAV pilot was located in Great Britain's Defence Science and Technology Laboratory. The Dutch pilot was flying his F-16 on a desktop simulator at TNO in The Hague, The Netherlands. The FAC was conducting his mission at NATO's Joint Force Training Centre, Bydgoszcz, Poland, wearing a virtual reality helmet. All of them were wrapped in a virtual environment created by the NATO Live, Virtual and Constructive simulation infrastructure. ACT, NCSA, The Netherlands and Great Britain put together this experiment hosted in part by JFTC.

Some comments from the forward air controllers, after the event, included, "doing simulated exercises before the initial live run is critical for making these more productive and for decreasing the number of failed runs". And, "practice of procedures with pilots of the different nations is essential for being ready for real operations. For example, it is critical to deal with different accents or to handle particular ways to describe objects".

"I think this is a huge step forward to improve the training for FACs and air support pilots engaged in multinational operations," said U.S. Navy Commander David James, Fratricide Prevention Integrated Program Team leader. He continued, "Distributed multinational training events such as the one demonstrated here are crucial for pre-deployment and mission rehearsal preparations in order to produce the desired effects for the Alliance in a timely and accurate manner."

NMSG Impact: C2-Sim MSG-048 and MSG-085

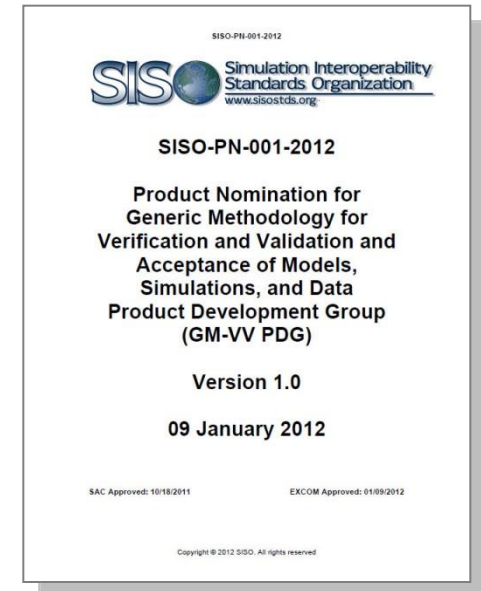
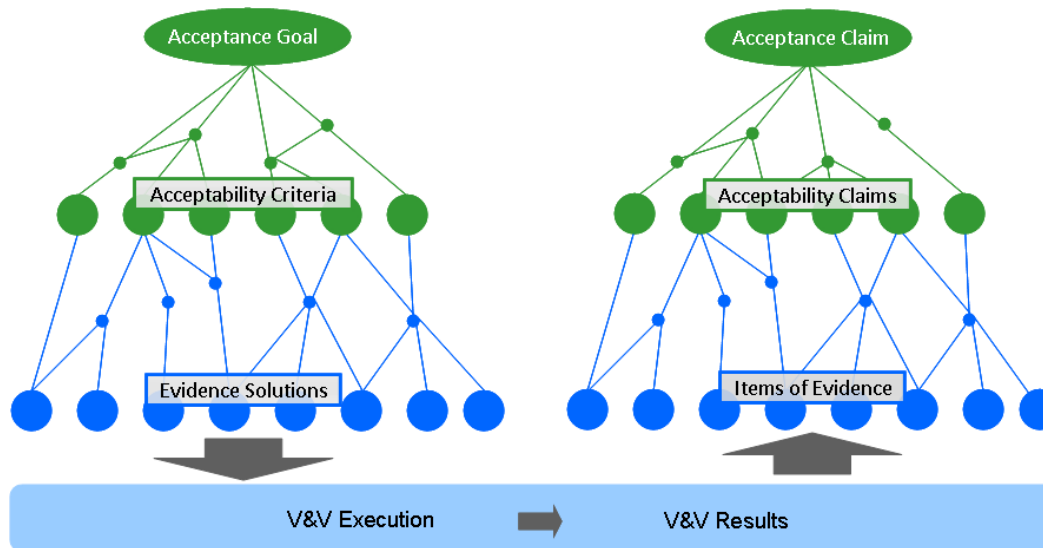


MSG-048



NMSG Impact: Validation of Simulations (GM-VV)

- › NMSG Leads development of international GM-VV standard



MSG-107 / HFM-220 Human Behaviour Modelling for Military Training Applications

- Specialist Team Meeting I
 - Dec 2011, Orlando, USA
- Specialist Team Meeting II
 - 14-15 June 2012, The Hague, The Netherlands
- Deliverables
 - TAP for new Cross-Panel Task Group, Submitted for Fall NMSG/HFM BM
 - Title: [Reference Architecture for Human Behaviour Modelling](#)



MSG-117 M&S Support for Cyber Defence

Investigate and recommend what aspects of Cyber Defence can be supported with Modelling and Simulation

Activity will focus on Education, Training, Exercise, Evaluation, Concept and Conops Development and their validation, Cyber Threat Assessment, enhancing cyber capabilities and technical solutions.

HACKER

**Kick-Off
Sept 2012**



Conclusions

- **Modelling and Simulation is increasingly important for supporting Current and Future Operations**
- **Modelling and Simulation supports training, capability development and operations**
- **S&T networking and M&S Standardisation activities are fundamental to exploit NATO's M&S potential**

Modelling and Simulation contributes to saving lives, saving time and money and preparing the war fighter better, faster and cheaper

Questions?

<http://www.cso.nato.int/panel.asp?panel=5>

BRIEFER

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