The Research & Technology Organisation (RTO) and The NATO Modelling & Simulation Group (NMSG)

NATO M&S Coordinaton Office (MSCO)

Approved for public release, distribution unlimited

See also ADA564685. 2010 Coalition Battle Management Language Workshop (Atelier 2010 sur le langage de gestion du champ de bataille pour les operations en coalition). RTO-MP-MSG-079
Content

• The NATO Research & Technology Organization (RTO)
  – Place in NATO
  – RTO Mission and Objectives
  – RTO 3-Level Structure
  – Support from the NATO Research & Technology Agency

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  – Mission
  – Structure
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• NMSG vs. RTO Panels
• MNSG Areas of Interest in M&S
• NMSG Program of Work
• Examples of Technical NMSG Activities
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• NATO M&S Master Plan. A challenge for the NMSG.
North Atlantic Treaty Organization

28 Member Nations
The Research & Technology Organization

- NATO Body funded 1st Jan 1998
- Unique forum for Technological Exchange
- Leader in NATO R&T
- Considered as a force multiplier in NATO
- Young organization but still in evolutionary phase: need to adapt to new NATO
- Many challenges ahead
- Includes RTB, RTA, Panels, NMSG ….
The Place of the RTO in NATO

North Atlantic Council

NATO C3 Board
Science for Peace & Security Committee
Military Committee MC
Allied Command Transformation
Allied Command Operations
RTO

Conference of National Armament Directors CNAD
NATO Army Armaments Group
NATO Naval Armaments Group
NATO Air Force Armaments Group
NATO Industrial Advisory Group
The RTO Mission

To conduct and promote co-operative research and information exchange within NATO and with its “Partners”.
The RTO Objectives

- To support the development and effective use of national defence R&T and thus to maintain a *technological lead* within the Alliance,

- To meet the *military needs* of the Alliance,

- To provide *advice* to NATO and national decision makers.
RTO: 1st Level
(RTB, RTA, IMC)
RTO 1st Level: Decision body RTB

- A Research & Technology Board (RTB)
  - Decision on RTO policy
- Supported by an Agency (RTA)
  - Permanent Support
- Which is supported by the IMC

Information Management Committee
RTA: The Research & Technology Agency

- RTA is the permanent structure for the RTO
- Unique mix of NATO Civilians (39) and IMPs/VNCs (14)
- Located in Paris, small group in NATO HQ
- Provide administrative support to the RTB, Panels, NMSG and to the scientific RTO community.
RTO: 2\textsuperscript{nd} Level
(Panel members' panels)

Board members'
Level
Leadership

Panel members'
Level
Panels

Expert members'
Level
Technical Teams

AVT  HFM  IST  SAS  SCI  SET  MSG

IMC

RTA

RTB

MSG-079
RTO 2\textsuperscript{nd} Level: Support Body  
(panels & group)

- AVT \textbf{Applied Vehicle Technology Panel}
- HFM \textbf{Human Factors and Medicine Panel}
- IST \textbf{Information Systems Technology Panel}
- SAS \textbf{System Analysis & Studies Panel}
- SCI \textbf{Systems Concepts & Integration Panel}
- SET \textbf{Sensors & Electronics Technology Panel}
- MSG \textbf{Modelling and Simulation Group}
RTO: 3\textsuperscript{rd} Level
(Groups: Network of Scientists & Engineers)
The RTO Network

- RTB Board Members (54)
- RTA Headquarters Staff (51+2)
- Panel/Group Members (344)
- Scientists/Engineers - (est. 3500)
The NMSG Mission

To promote co-operation among Alliance bodies, NATO member nations and Partner nations to maximise the effective utilisation of M&S.
NMSG Leadership

NMSG Chairman: Mr. Rob SMITH (GBR)
Head of Weapon System Simulation & Experimentation
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E/M : rob.smith@mbda.co.uk

NMSG Vice Chair: Mr. Niels KRARUP-HANSEN (DNK)
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Senior Advisor, MSc.
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MSCO - M&S Coordination Office

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NMSG Structure: MORS, PPC & MS3

NMSG Plenary Session

MORS
Military Operational Requirements Subgroup

PoW
Programme of Work

PPC
Programmes and Planning Committee

MS3
M&S Standards Subgroup

NMSG Structure: MORS, PPC & MS3
NMSG - Membership

• Main nations are represented by both
  – Technical M&S Experts (from M&S national offices) generally responsible for M&S policy and development in their nation,
  – Military Officers (mainly interested in M&S application to support military activities).

• NMSG fully open to PfP nations and recently opened to Australia. MD under discussion.

• NMSG - the best opportunity for dialogue with nations!!
  – MORS: Military/Civilian Personnel from MoD
  – MS3: Technical Experts in Standards Mil./Gov./Acad.
  – PPC: Technical Experts in M&S from M&S, OR Offices
  – PLENARY: National reps with decision authority.
**NMSG Chairman:** Rob SMITH (GBR),  
**Vice-Chair:** Niels KRARUP-HANSEN (DNK)

**MSCO Head:** Juan J. RUIZ (ESP),  
**Deputy Head:** Vacant,  
**Chief Scientist:** Vacant,

**Tech. Officer:** Adrian VOICULET (ROU),  
**Assistant:** Ms Illeana GANZ (USA)

### NATO:

<table>
<thead>
<tr>
<th>Belgium</th>
<th>Greece</th>
<th>Spain</th>
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<td>Bulgaria</td>
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<td>France</td>
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### Partners for Peace:

- Belarus - Georgia - Moldavia - FYROM - Australia
- Finland - Sweden - Uzbekistan - Switzerland

### Contact Nations:

- ACO
- ACT
- IMS
- NC3A
- JWC
- NIAG
The RTO Panels and Group

- R&T: Research
- S&T: Science
- R&D: Research
- New Technologies
- Low TRL scales
- Pure Sciences
- PoW driven by LTCR, DAT, …

VS

- Technology
- Technology
- Development
- Applications
- High TRL scales
- Applied Sciences
- PoW driven by M&S MP objectives, LTCR, DAT, …

- MSCO Should Provide Expertise (Chief Scientist)

- STANDARDS Activity

Scientists

Engineers
NMSG PoW

Source: Nations
Benefit: Nations

Natural Process
- Driven by Nation needs.
  - MORS 15%
  - PPC 85%

Total 80%
Bottom-Up

Source: NATO
Benefit:
- NATO & NATIONS

Forced Process, driven by:
- LTCR, DAT, PSA
- NATO HP

Noticeable examples:
- MSG-068
- NATO M&S MP Update

Total 20%
Top-Down
NMSG Terms of Reference

The Mission of the NATO Modelling and Simulation (M&S) Group (NMSG) is to promote co-operation among Alliance bodies, NATO Member Nations and PfP 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 RTO and from other NATO organisations.

The activities of the Group are guided by the RTO Rolling Plan and governed by the NMSG Strategy and Business Plan.
M&S ≠ Interest for NMSG

- **MODELLING:**
  Action of creating a physical, mathematical, logical etc. representation of a system, entity, phenomenon, or process.

- **SIMULATION:**
  A method for implementing a model over time.

- **COMMON MISTAKE:**
  Not all M&S activities that fit the definitions are of interest to the NMSG, most of them are NOT!

RTO Panels work on a daily basis with M&S, they (sometimes) do not know and we (sometimes) do not care.
NMSG Areas of Interest

There are 2 keywords to understand the PoW of the NMSG:

1. Interoperability
2. Reuse

There are 3 areas of interest in M&S for the NMSG:

1. M&S under a Federation Enabled Concept
2. M&S applied to Distributed Education & Training
3. M&S STANDARDS
M&S Master Plan Objectives

1. Establish a Common Technical Framework
2. Provide Common Services in NATO M&S
3. Develop Simulations
4. Employ Simulations
5. Incorporate Technological Advances

NMSG
NC3A, nations & industry
NATO Training Centers (JJJ) & NC3A
M&S Master Plan Sub-Objectives

1. Establish a Common Technical Framework
   - 1.1 Adopt HLA
   - 1.2 Establish data interchange standards

2. Provide Common Services in NATO M&S
   - 2.1 Compile M&S information
   - 2.2 Provide M&S education
   - 2.3 Establish a Simulation Resource Library
   - 2.4 Establish a helpdesk

3. Develop Simulations
   - 3.1 Identify & prioritize requirements
   - 3.2 Identify strategies
   - 3.3 Allocate resources
   - 3.4 Execute strategy
   - 3.5 Provide feedback

4. Employ Simulations
   - 4.1 Plan employment
   - 4.2 Provide resources
   - 4.3 Provide databases
   - 4.4 Operate simulations
   - 4.5 Conduct Impact Assessment

5. Incorporate Technological Advances
   - 5.1 Monitor M&S-related advances
   - 5.2 Conduct R & D
   - 5.3 Share information
   - 5.4 Implement advances
M&S Application Areas

Acquisition

Education and Training

Planning and Analysis

Strategic

Operational

Tactical

Systems
Classification of the NMSG Activities

• Standards Related - 30%

• Best practice (Info exchange) - 40%

• Applications/Experimentation - 30%
NMSG Activities

• Working groups (Task Groups / Exploratory Teams)
  – Minimum of 4 nations / Not required
  – 3 years / 1 year
  – Final Report / Report, TAPs

• Organising Conferences, Workshops, Lecture Series, Seminars, Specialists Teams …
  – NMSG Annual Conference 2009 Brussels, 2010 Utrecht

• Participating to M&S related events
  – ITEC, I/ITSEC
  – SISO International Workshops
  – National M&S Conferences (IberSIM 09, USMOS 09) …
NATO - OTAN

NMSG:
Examples of Technical Activities
MSG-048 / MSG-085

Coallition Battle Management Language

C-BML

NORTaC-C2IS

SCIPIO

APLET

SIMBAD

C2LG

ISIS

JSAF

CAPES

Orders & Plans

JC3IEDM +

Reports

Robots

Humans

Research and Technology Organisation

Coallition Battle Management Language (C-BML) is a battle management language designed for use in multi-national military operations. It facilitates the exchange of orders, plans, reports, and information between different systems and platforms. The diagram illustrates the integration of several systems and applications, including NORTaC-C2IS, SCIPIO, APLET, SIMBAD, C2LG, ISIS, and CAPES, into the C-BML framework. This integration supports the communication of orders and plans, as well as the exchange of reports and information between different components of the command and control system.
MSG-049: M&S System for Emergency Response Planning and Training
MSG 053 – Rapid Scenario Generation for Simulation Applications

**Rapid Scenario Generation**

**SCENARIO SETUP**
- Design Architecture
- Simulation Preparation
- Core Database
- Post Event Analysis
- Policy, Doctrine, Directives
- Lessons Learned

**EVENT**
- Control
- Data Collection
- Live
- Virtual
- Constructive

**MSG 053 – Rapid Scenario Generation for Simulation Applications**
MSG–068
NATO Training Federation (NTF)
MSG-069
NMSG M&S Conference

RMA, Brussels
Week of 15-16 October 09
MSG-076
NMSG M&S Conference 2010

Blending LVC Simulation to Better Support Training & Experimentation

Call for Papers – www.rto.nato.int
Deadline for abstracts 30 May 2010

Utrecht, The Netherlands
Conference Centre in Soesterberg
16 and 17 September 2010
C-BML presence in the NMSG Events
OTAN - NATO

NMSG: MS3
M&S Standardisation in NATO
NMSG M&S Standards Activity:

- With the disbandment of NATO Army Armaments Group and Land Group 8 in Apr 03.
  - NMSG was officially named as the Delegated Tasking Authority for NATO M&S standards by CNAD in 2003

Thank you for your letter of 8 August requesting the delegation of authority to the Research and Technology Board’s NATO Modelling and Simulation Group (NMSG) for the development, production and maintenance of NATO Standardization Agreements (STANAGs) and Allied Publications (APs).

The plan developed by the NATO Army Armaments Group (NAAG) for the closure of Land Group 8 on Simulation Interoperability for Joint Training and Operational Support proposed the transfer of that group’s responsibility for fostering interoperability in the area of modelling and simulation to NMSG. This proposal was supported by the Conference of National Armaments Directors (CNAD). With responsibility must come authority, so as ChairmanCNAD I fully support your request and would ask Director NATO Standardization Agency to note the delegation of this function, in accordance with Section 109 of reference, to NMSG.

To ensure good co-ordination between the efforts of NMSG and those of other CNAD bodies, I would ask that NMSG regularly brief those groups with an interest in this area on its activities, in particular the NAAG.

- NATO (RTO) Signed a TCA with SISO in 2007
NMSG M&S Standards Activity:

• High Level Architecture (HLA) STANAG 4603; has been Promulgated by NSA 02 Jul 2008. Nations continue ratification in 2009

• Synthetic Environments Data Representation and Interchange Specification (SEDRIS) STANAGs 4662, 4663 & 4664; in ratification process right now.
M&S Standards Sub Group (MS3)


- The MS3 will host the HLA Certification Advisory Group, CeAG following completion of RTO TG MSG-050 – HLA WG.

http://www.nato.int/docu/stanag/amsp/AMSP-01.pdf
NATO - OTAN

NMSG: NATO M&S Master Plan Update
NATO M&S Master Plan

CNAD created SGMS in 1996 to:
Craft an Alliance approach to achieve Simulation Interoperability and Reuse
Develop a preliminary NATO M&S Master Plan
Draft a roadmap to achieve prioritized NATO Simulated Environments
Recommend NATO Policies regarding M&S Management
Present a Final Report through the RTB, to CNAD and MC
NATO M&S Master Plan

SGMS’s Final Report consequences:

NATO M&S Master Plan
NATO Policy on M&S:
Creation of NMSG
Creation of MSCO

Approved by North Atlantic Council
NATO and M&S have evolved since 1998!
NMSG still guided by the NATO M&S MP
Changes in NATO since 1998 (I)

New NATO Command & Force Structure:
ACO with Operational Responsibility
ACT with Transformation Responsibility, including partnership with USJFCOM
NATO Centers of Excellence
Changes in NC3A
New JWC
New JTFC
New JALLC
Changes in NATO since 1998 (II)

NATO changed Policy:
  Type of Operations, Humanitarian, DAT, Piracy ...
  Relation with new Partners
New Requirements: High Readiness Forces
  Rapid Reaction Corps
  Rapid Deployable Forces
  New player EUROCORPS
Low Readiness Forces
NATO Response Force

In summary:
A whole spectrum of new Training Requirements …
Changes in M&S since 1998

“The M&S market is in the middle of a disruptive transition from
Low-volume,
High-priced simulations,
Custom-made for each application
to a
High-volume,
Low-priced market,
Interoperable COTS, GOTS products.
This explosion of simulation deployment will have a similar effect to what the PC did to the mainframe or the GPS to the nautical chart or map.”

Warren Katz, Spring 2008 – EuroSATORY

…and new approaches to maximize the effective utilisation and co-ordination of M&S (NMSG Mission)
Want to know more?: http://www.rto.nato.int/
Questions
The Research & Technology Organization (RTO).
The NATO Modelling & Simulation Group (NMSG)

OTAN - NATO

North Atlantic Treaty Organisation
Back-up slides
NATO Simulation Resource Library (NSRL)

Background

- a generic, distributed, multi-user application which allows for searching, retrieving and uploading of resources from different locations spread over interested NATO/PfP Nations & Organisations

- a fundamental tool to facilitate interoperability and reuse of M&S resources amongst NATO/PfP Nations

- a NATO RTA funded project – requirement derived from the NATO Modelling & Simulation (M&S) Master Plan
Architecture for NSRL

RTO NSRL Web Portal (@ RTA)

via Web Services (IEEE 1420, MSG-012, XML Data Flow...)

INTERNET

via Web Service IEEE1420
via Web Service MSG-012
via Web Service IEEE 1420
via Web Service IEEE 1420
via Web Service MSRR (XML Data Flow)

Spain - SRL Library - Database
Germany - SRL Library - Database
PATHFINDER - Database
RTO - SRL - Database
US - MSRR Library - Database
NSRL REGISTRATION PROCESS

www.rto.nato.int

Locate & click on MSG-NSRL
QUESTIONS ?

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