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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
• The NATO Modelling & Simulation Group (NMSG)
  – Mission
  – Structure
  – Membership
• NMSG vs. RTO Panels
• MNSG Areas of Interest in M&S
• NMSG Program of Work
• Examples of Technical NMSG Activities
• Standards Activity: MS3
• NATO M&S Master Plan. A challenge for the NMSG.
North Atlantic Treaty Organization

28 Member Nations
The Research & Technology Organization

- NATO Body funded 1\textsuperscript{st} 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
- Conference of National Armament Directors CNAD
  - NATO Army Armaments Group
  - NATO Naval Armaments Group
  - NATO Air Force Armaments Group
  - NATO Industrial Advisory Group

- Allied Command Transformation
- Allied Command Operations
  - NATO Underwater Research Center
  - RTO
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: 1\textsuperscript{st} 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: 2nd Level
(panels and group)
RTO 2nd Level: Support Body
(panels & group)

- AVT  Applied Vehicle Technology Panel
- HFM  Human Factors and Medicine Panel
- IST  Information Systems Technology Panel
- SAS  System Analysis & Studies Panel
- SCI  Systems Concepts & Integration Panel
- SET  Sensors & Electronics Technology Panel
- MSG  Modelling and Simulation Group
RTO: 3rd 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

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E/M: ganzi@rta.nato.int
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.
<table>
<thead>
<tr>
<th>Partners for Peace:</th>
<th>Contact Nations:</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Belarus</td>
<td>- Australia</td>
</tr>
<tr>
<td>- Finland</td>
<td>- Georgia</td>
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<tr>
<td>- Georgia</td>
<td>- Sweden</td>
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<td>- Moldavia</td>
<td>- Uzbekistan</td>
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<tr>
<td>- FYROM</td>
<td>- Switzerland</td>
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</tbody>
</table>

**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:**
- Belgium
- Bulgaria
- Canada
- Czech R.
- Denmark
- Estonia
- France
- Germany
- Greece
- Italy
- Hungary
- The Netherlands
- Norway
- Poland
- Portugal
- Romania
- Spain
- Slovakia
- Slovenia
- Turkey
- United States
- United Kingdom

**Ex-Officio:**
- ACO
- ACT
- IMS
- NC3A
- JWC
- NIAG
NMSG PoW, Involvement with NATO S&T

MSG-048
MSG-052
MSG-066
MSG-068
MSG-085

MSG-048
MSG-052
MSG-053
MSG-068
MSG-084
MSG-090

MSG-060
MSG-061
MSG-069
MSG-070
MSG-074
MSG-078

MSG-053

NATO C3 Agency

Allied Command Transformation

Allied Command Operations

RTO

NMSG

NATO C3 Agency

NMSG PoW, Involvement with NATO S&T

MSG-060
MSG-069
MSG-076

Strong tie
Significant contact
Occasional contact
TGs, W/S, ETs
Symposia

NATO Army Armaments Group
NATO Naval Armaments Group
NATO Air Force Armaments Group
NATO Industrial Advisory Group

MSG-049
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

Objective 1: Establish a Common Technical Framework
Objective 2: Provide Common Services in NATO M&S
Objective 3: Develop Simulations
Objective 4: Employ Simulations
Objective 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
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

North Atlantic Treaty Organisation
MSG-048 / MSG-085
Coallition Battle Management Language

C-BML

Orders & Plans

JC3IEDM +

Reports

NORTaC-C2IS

C2LG

ISIS

CAPES

Robots

Humans

APLET

SCIPIO

SIMBAD

JSAF

Research and Technology Organisation

NATO AGENCY

Canada

Denmark

Finland

Germany

France

Italy

Spain

Turkey

United Kingdom

United States
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
- Policy, Doctrine, Directives
- Lessons Learned
- Post Event Analysis

EVENT
- Control
- Data Collection

Live
Virtual
Constructive

MSG 053 – Rapid Scenario Generation for Simulation Applications
URBAN COMBAT ADVANCED TRAINING TECHNOLOGY 2

MSG-063
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](http://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 Chairman CNAD 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.
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
OTAN - NATO

The Research & Technology Organization (RTO).
The NATO Modelling & Simulation Group (NMSG)
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

RTO - SRL - Database

via Web Service

MSRR (XML Data Flow)

Spain - SRL Library - Database

Germany - SRL Library - Database

PATHFINDER - Database

US - MSRR Library - Database

NSRL User
QUESTIONS?

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