Ministry of Defence

JSP 939
Defence Policy for Modelling & Simulation (M&S)

Part 1: Directive

Foreword

As a key enabler, Modelling & Simulation (M&S) has clear potential for wide utility and application across the Defence Enterprise, both in terms of cost benefits but also providing a mechanism for satisfying otherwise impossible or challenging Defence requirements. It also provides environmental benefits over traditional options.

Better coordination of activity, guidance and acquisition are needed to enable Defence to exploit the maximum benefit from investment in M&S. This JSP sets out appropriate direction, clear governance structures and suitable mechanisms to resolve issues and reduce risk, enabling the Front Line Commands (FLCs) to develop and deliver M&S based solutions in a technically coherent manner.

Under the direction and guidance of the Defence Modelling and Simulation Coherence (DMaSC) Technical Authority (TA), the aim is to provide a coherent framework of M&S enablers and resources, accessed through the Defence Simulation Centre (DSC), that are reusable, interoperable, reconfigurable and cost effective, not just across the Defence Enterprise but also with our Allies.

As the Defence 3* Military Capability Management Functional Owner, I mandate compliance with this JSP beginning with early engagement with the DMaSC TA, through the DSC, to ensure success.

Air Marshal Richard Knighton
Deputy Chief of Defence Staff (Military Capability)
Functional Owner for Military Capability Management

Preface

How to use this JSP

1. JSP 939 is intended to provide Defence Direction and Guidance for the acquisition, development and usage of M&S across Defence. It is designed to be used by staff responsible for any M&S capability change. This JSP contains the policy and direction on M&S from a Defence Enterprise perspective and guidance on the processes involved and best practice to apply to any M&S development.

2. The JSP is structured in two parts:

   a. **Part 1 - Directive**, which provides the direction that must be followed in accordance with statute or policy mandated by Defence, or on Defence by Central Government.

   b. **Part 2 - Guidance**, which provides the guidance and best practice that will assist the user to comply with the Directive.

Coherence with other Policy and Guidance

3. This JSP is designed to be compatible with the following Defence directives.

Related JSP	Title
JSP 440	Defence Manual of Security and Resilience
JSP 441	Information, Knowledge, Digital and Data in Defence
JSP 465	Defence Geospatial Intelligence Policy
JSP 490	Defence Cryptosecurity Operating Instructions
JSP 604	Defence Manual for Information and Communications Technology (ICT)
JSP 745	Digital Publishing Policy
JSP 901	Technical Governance and Assurance of Capability
JSP 906	Defence Principles for Coherent Capability
JSP 920	MOD Standardization Management Policy
JSP 945	MOD Policy for Configuration Management

Training

4. There is no specific requirement to undertake training in order to make use of this JSP; however, relevant educational courses to support the requirement for Suitably Qualified and Experienced Personnel (SQEP) are delivered by Cranfield University at the Defence Academy. Recommended courses include the following:

- An Introduction to Defence Simulation (IDS).

- Simulation Employment Training (SimET).

- Masters in Defence Simulation & Modelling (MSc DSM).

5. More details on these courses and other related courses can be found via the Defence Academy website at www.da.mod.uk.

Further Advice and Feedback – Contacts

6.   The owner of this JSP is UKStratCom Cap C4ISR Dep Hd Joint Training & Simulation (JTS). For further information on any aspect of this guide, or to ask questions not answered within the subsequent sections, or to provide feedback on the content, please contact:

Job title/email	Project focus	Telephone
DMaSC Technical Authority Hd UKStratCom-DMaSC-TA	DMaSC	9360 58818
DMaSC Lead SCTA (Defence) UKStratCom-DMaSC-TA	DMaSC	9352 71321

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Defence Policy for Modelling & Simulation

Sponsor: DCDS (Mil Cap)

Scope

1.   This JSP sets out the technical governance and assurance framework to be applied as appropriate to Modelling & Simulation (M&S)[1] across Defence. The role of the Defence Modelling and Simulation Coherence (DMaSC) Technical Authority (TA) is to promote Value for Money (VfM) at the Defence Enterprise level and build corporate knowledge supported by the Defence Simulation Centre (DSC)[2].

2.   This JSP applies to all uses of M&S. However, due to resource constraints, the initial focus of the DMaSC TA and the DSC will be primarily on training capabilities unless directed otherwise by the TA.

3.   NATO defines M&S as the discipline that '*develops and/or uses models, simulations and simulation systems*'[3]. It is important to note that M&S is a term in itself and not the sum of the two words 'modelling' and 'simulation'.

4.   The NATO definitions of 'model' and 'simulation' are[3]:

   a.   **Model** - a physical, mathematical or otherwise logical representation of a system, entity, phenomenon, or process; and

   b.   **Simulation** - the execution of a system model over time.

5.   M&S is a key enabler for Defence that is increasingly supporting a wide range of activity that includes: decision making, training and education, mission rehearsal, acquisition, operational analysis, test and evaluation, and experimentation. Such disparate activities provide a challenge in the delivery of VfM in accordance with JSPs 901 and 906 and the exploitation of investment.

Purpose of this JSP

6.   This JSP is designed to:

   a.   direct, ensure and assure the coherent development of M&S as an enabler in support of Defence Outputs.

   b.   ensure Defence will have effective and technically coherent M&S based capabilities that are interoperable, reconfigurable, innovative and provide VfM at the Defence Enterprise level.

Principles

7.   Improved direction, governance, advice, guidance and coordination across Defence will

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[1] In this context, M&S only applies to computer-based M&S.
[2] For the purposes of this document the use of the term simulation includes the acknowledgement of the precursor process of modelling, although it needs noting that there is much modelling in Defence which does not relate to simulation. Australian Joint Simulation Strategy, 2018.
[3] NATO definitions can be found at: https://nso.nato.int/natoterm/content/nato/pages/home.html?lg=en.

yield more flexible, affordable, effective and efficient M&S-based systems via the following principles:

    a.   Defence M&S resources and corporate knowledge, as provided through the DSC, are to be developed and exploited where appropriate.

    b.   M&S is to be developed coherently[4] across Defence and exploited to deliver the widest possible benefits to support Defence Final Outputs.

    c.   TLBs' M&S strategies and supporting plans are to conform to this policy and are to be reflected in their respective annual Command Plans or equivalent.

    d.   the DMaSC approach is to maximise VfM across the Defence Enterprise by ensuring technical coherence for M&S across Defence, and with Allies, without stifling innovation.

    e.   applicable M&S change activity is to be compliant with DMaSC TA direction, initially through engagement with the DSC.

    f.   owners of all M&S are to contact the DSC to register their assets and resources.

    g.   interoperability is to be considered for all M&S systems and developed through a common technical architectural approach and the reuse of data.

Governance & Approach

8.   **Head Office Roles and Responsibilities**. DIRECT: to assist DCDS (Mil Cap) in meeting the responsibilities as associated with the Defence Authority for Capability Coherence role, the MCB will routinely consider appropriate elements of M&S. With respect to the development of M&S, the MCB will provide prioritised, clear direction and guidance on capability coherence issues or technical compliance issues that cannot be resolved at the DMaSC TA level. Following on from this:

    a.   DCDS (Mil Cap) delegates authority of the DMaSC TA to UKStratCom Cap C4ISR Dep Hd JTS.

    b.   UKStratCom Cap C4ISR Dep Hd JTS delegates authority to each of the SCTAs.

    c.   UKStratCom Cap C4ISR Dep Hd JTS provides regular M&S Projects Status updates to the MCB.

9.   **TLB Roles and Responsibilities**. DEVELOP, DELIVER, OPERATE:

    a.   UKStratCom Cap C4ISR will provide the DMaSC TA, which supports, advises and assures coherence across all M&S development in Defence[5].

    b.   The DMaSC TA will:

        (1)   develop relevant architectures, including identifying which M&S standards Defence should follow, in order to promote reuse and interoperability.

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[4] As per JSPs 901 and 906.
[5] The TA holds meetings with FLC representatives quarterly and engages with projects directly as required.

(2) assure systems compliance iaw the DMaSC Rule Set[6] in order to ensure coherence and VfM at the Defence Enterprise level.

(3) support the TLBs in making the most appropriate acquisition choices for Defence; where serious conflicts of interest arise, these will be referred to the MCB.

(4) provide the Training Requirements Authority (TRA) function for the M&S courses delivered at the Defence Academy.

(5) prioritise the taskings carried out by the Defence Simulation Centre (DSC).

(6) engage Industry through the DMaSC Industry Advisory Group (DIAG).

c. UKStratCom Cap C4ISR Dep Hd JTS, as DMaSC TA Head, will be supported by a virtual team of DMaSC Service Command Technical Authority (SCTA) representatives, with the Defence incumbent acting as the lead SCTA.

d. Each Service Command is to establish a SCTA post and to appoint a suitably qualified and experienced individual (i.e. SQEP) as agreed with the DMaSC TA Hd.

e. Each SCTA is empowered to act on behalf of the DMaSC TA Hd for M&S technical coherence matters.

f. The Defence Simulation Centre (DSC) will support the DMaSC TA in providing technical coherence across the Defence Enterprise. Any Defence user seeking to develop or procure M&S based systems is to liaise with the DSC. The core functions of the DSC include:

(1) the provision of M&S technical advice and guidance through the SCTAs.

(2) DMaSC Compliance Support.

(3) knowledge and information management (including communications).

(4) management of the DMaSC Catalogue.

(5) management of the DMaSC Common Simulation Services.

(6) Synthetic Environment content reuse and management.

(7) experimentation facilities.

(8) Verification, Validation & Accreditation.

(9) Test & Reference.

10. **Coherence**. Capability coherence will be achieved in the following ways:

a. **Direction**. All users of M&S (including capability areas and delivery agents) are to follow TA direction on DMaSC compliance issues.

b. **Compliance**. All M&S capability or solution changes are to be DMaSC compliant

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[6] JSP 939 Part 2.

and all capability areas are to ensure that this is to be included as a specific mandated requirement in any URD (as detailed in the Knowledge in Defence (KiD) tool[7]).

c.   Capability areas and delivery agents are to engage with the DMaSC TA at inception and throughout the project lifecycle. Note that only the DMaSC TA Hd can determine and assure DMaSC compliance.

d.   **Compliance Assessment**. Through initial engagement with the DSC to initiate the process, DMaSC compliance is assessed by a SCTA against a set of specific rules as follows:

> (1)   **Rule 1: Reuse Existing**. Any available existing systems, components, services, data and licences that meets the M&S requirement must be used as the default or 'Do Minimum' option.

> (2)   **Rule 2: Procuring for Reuse**. Any new/modified/enhanced M&S components, services and data acquired by a project shall be made available for reuse via the DMaSC M&S Catalogue in formats specified in Def Stan 03-50 where applicable and practicable.

> (3)   **Rule 3: M&S Standards**. Any M&S standards selected for use by the capability or technical solution change must be compliant with Def Stan 03-50.

> (4)   **Rule 4: Enumerations**. All new and revised distributed simulation enumerations must comply with the DMaSC Enumerations Policy and be registered with the Defence Simulation Centre (DSC).

> (5)   **Rule 5: M&S Enterprise Architecture**. All M&S-based capability must be developed in accordance with the DMaSC Enterprise Architecture approach (both in terms of engineering approach to implementing the architecture and the agreed physical architecture itself) as advised and approved by the relevant SCTA.

> (6)   **Rule 6: Technical Documentation**. In order to support interoperability and reuse, suitable documentation must be made available for all M&S-based capabilities; this includes Interface Control Documents (ICDs), 3D model metadata etc.

> (7)   **Rule 7: Synthetic Environment (SE) Data**. All are to attempt to source all M&S-based capability needs for SE Content Data via the DSC; this includes terrain data, 3D models, hydrographic data etc.

> (8)   **Rule 8: Research and Reports Exploitation**. All M&S-related research and decision support activity, including any outputs, is to be registered with the DSC.

e.   **Exploitation Opportunities**. The DMaSC TA will expose common requirements to identify intervention opportunities for collaboration and reuse between projects through routine engagement.

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[7] http://aof.uwh.diif.r.mil.uk/aofcontent/tactical/mands/content/ms_common_ur.htm.