



JSP520

UK MOD's ORDNANCE, MUNITIONS AND EXPLOSIVES SAFETY MANAGEMENT SYSTEM

Part 1- Policy

Issue 2.0

A handwritten signature in black ink, which appears to read 'Kevin Treharne'. The signature is written in a cursive style and is positioned above a short horizontal line.

By command of the Defence Council

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- 2.0F IPT draft for comment
- 2.0G Final draft

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3		Page 20: Para 5.3.3, OME Risk Category Page 21: Pare 5.3.6.6 Page 27: Para 6.4 Page 28: Para 6.6	14 Apr 09
4		Para 5.3.12 & 6.8 inclusion of SOLAS Para 5.3.6.4 inclusion of Logistic Parachute Delivery Clearance Para 7.2.4 inclusion of NOS	27 Aug 09

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PREFACE

It is the Defence Ordnance Safety Board's (DOSB) requirement that the highest standards of safety management shall be delivered. This is achieved through the development of its policies into a robust and comprehensive Safety Management System for Ordnance, Munitions and Explosives (OME), articulated in a series of Joint Service Publications (JSPs) endorsed by the DOSB. There are clearly hazards and risks whenever explosives are commanded to function. The inadvertent functioning of explosives can have catastrophic consequences for personnel, the environment and for Defence capability. The majority of modern weapon systems continue to rely on the power of explosives, propellants and pyrotechnics (collectively termed explosives) to achieve the desired military effect. Thus the control of explosive hazards is essential if the MOD is to fulfil its common-law duty of care obligations, and fulfil its statutory obligations while maintaining Defence Capability.

JSP520 specifies the DOSB's policy for inherent OME safety across the acquisition cycle within the Ordnance, Munitions and Explosives Safety Management System thus providing a common thread throughout the family of documents. It defines the approach that shall be taken to ensure that systems remain safe and serviceable during their service life (including disposal) by reducing risks to levels As Low As Reasonably Practicable. It also defines the responsibilities of the key stakeholders in the acquisition process and specifies the required methodology for assuring the Secretary of State for Defence that the arrangements for Ordnance, Munitions and Explosives safety are consistent with his safety policy statement.

KJ LEESON
Air Vice-Marshal
Chairman Defence Ordnance Safety Board

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1. INTRODUCTION

1.1 MOD Safety Policy Structure

1.1.1 The Secretary of State (SofS) for Defence has overall responsibility for Environment, Health and Safety throughout the MOD, and has published a top-level statement¹ in Defence Environment and Safety (JSP 815, Ref.1) JSP815 defines the structure and form of the seven Functional Safety Boards, whose responsibilities are delegated from the top-level Defence Environment and Safety Board (DESB). The seven functional safety boards are as follows:

- Defence Ordnance Safety Board (DOSB).
- Defence Nuclear Environment Safety Board (DNESB).
- Land Systems Safety Board (LSSB).
- Ship Safety Board (SSB).
- MOD Aviation Regulatory Safety Board (MARSB).
- Sustainable Development & Environment Board (SDEB)
- Occupational Health & Safety Board (OHSB)

1.1.2 The overarching DESB safety policy is promulgated by each board in the form of JSPs. For Ordnance, Munitions and Explosives (OME), the DOSB sponsors a number of JSPs and associated publications that collectively form the OME Safety Management System (OME SMS) described in this document. The aim of the OME SMS is to ensure that the levels of inherent risk presented by all OME acquired for use by, and at the direction of, the MOD can be demonstrated to be As Low As Reasonably Practicable (ALARP) and tolerable. The assessment of inherent OME safety risks presented to MOD personnel, third parties, materiel and the environment applies across the whole acquisition cycle and at any stage in a Manufacture to Target or Disposal Sequence (MTDS - see Section 3).

1.1.3 MOD must fulfil its statutory obligations and its common-law duty of care whilst maintaining Defence capability. Core requirements have been placed on IPTLs to generate safety cases, and to establish a safety management system to manage them. These are published in domain-specific standards for Land (JSP454), Sea (JSP430) and Air (JSP553), (Refs. 3 to 5). However, due to the specialist nature and inherent hazards associated with OME, JSP520 supplements these requirements with specific procedures, assessments and technical requirements.

1.1.4 The MOD has adopted modern best-practice by adopting a goal-setting SMS and the development of a body of evidence collated in a set of documents termed a safety case. This top-down, risk-based, approach permits efficiency savings and the proportionate prioritisation of resources according to the significance of the risks. Inputs to the safety case can draw upon modern and traditional safety management procedures, the application of good engineering practice and even prescriptive standards where proportionate. Additionally MOD is able to draw upon its considerable in-service experience with a wide range of OME systems. Outputs from a safety case, together with clearances and certificates, provide the degree of safety assurance demanded by the DOSB. JSP520 is split into two distinct parts, namely:

- Part 1 - Policy.
 - Part 2 - Guidance.
- a. **Part 1** provides the policy framework, which applies throughout the whole acquisition cycle. It mandates a series of requirements, processes, inputs, outputs and independent reviews which collectively support claims of inherent OME safety. The assessment of inherent OME safety shall cover those hazards that result from the initiation of OME systems, whether intentional or unintentional, and across all stages of the MTDS. These requirements and scope of safety responsibilities apply equally to OME systems operated by MOD personnel and to systems being operated at the direction of MOD by third parties and/or its contractors. Responsibilities for safety issues that fall outside the definition of inherent OME safety shall be managed in accordance with policy requirements in the overarching domain-

¹Policy statement by Secretary of State for Defence on Safety Health and Environmental Protection in the MOD Dec 2006

specific safety JSPs and associated publications even if they remain the responsibility of the OME IPTL.

- b. **Part 2** expands on the Part 1 policy framework, describing in more detail the roles, responsibilities, procedures and techniques to be employed to implement the policy. It stops short of mandating methodologies or techniques, but provides guidance in the form of an Approved Code Of Practice (ACOP). Compliance with Part 2 and associated safety policies is likely to meet the requirements of Part 1 and provide robust evidence that the levels of risk presented to personnel, third parties, materiel and the environment can be assessed and reduced so far as reasonably practicable.

1.1.5 Compliance with the requirements of JSP520 will bring about commensurate through-life savings by consideration of hazards, reducing the frequency of incidents and mitigating their consequences. In turn, sound safety management principles help to generate increased confidence in equipment, resulting in improved morale and operational capabilities. Importantly, in the event of an incident, assurance authorities will be looking for evidence, which demonstrates that Duty Holders have fulfilled their safety obligations via compliance with relevant standards and policies. The audit trail that the JSP520 processes generate will provide evidence of best practice in the management of OME safety.

1.1.6 The requirements of this policy, which is sponsored by the DOSB, align and are compatible with the requirements for any MOD safety management system and safety case and are repeated for clarity in Section 3.

1.2 Terminology

1.2.1 The following terminology is used in this document to distinguish between different types of review and approval activities:

- **Agree.** To agree that a document fairly represents the current situation, within the scope of knowledge of the signatory.
- **Endorse.** To assert that a document meets the requirements of relevant policy, procedures and good practice.
- **Authorise.** To assert that a document may be issued and that it reflects the individual's acceptance of responsibility.
- **Assurance.** Adequate confidence and evidence, through due process, that safety requirements have been met.

1.2.2 The term "Incident" has been used generically to cover incidents, accidents and near misses.

2. SCOPE

2.1 Overview

2.1.1 The scope of JSP520 covers all equipment and systems that satisfy the agreed NATO definitions of OME (Ref.6). It applies to OME operated by and at the direction of the MOD (including contracted services), and shall be applied at every stage of the Acquisition Cycle and across the complete MTDS as described in Section 3.5 of this document. The policy and procedures that JSP520 promulgates assess risks to MOD personnel, third parties, materiel or the environment, and specify how levels of inherent OME safety risk for systems and their constituent components shall be established and demonstrated.

2.1.2 JSP520-compliant processes shall complement the overarching safety activities described in Section 3 conducted to establish overall equipment risk levels. Where there is no higher-level safety case produced in accordance with one of the domain-specific safety JSPs, safety management activities above and beyond those specified to capture inherent OME hazards will be required to generate evidence to support safety claims.

2.1.3 The IPTL, as the delegated Duty Holder for inherent OME Safety, is responsible for complying with, and demonstrating both their own and other identified duty holder's compliance with, the requirements of JSP520 within the defined boundaries of their safety case. In turn, the OME Safety Review Panel (OSRP) has responsibility for providing assurance as part of the overall MOD permissioning regime through independent, specialist review of documentation produced by the OME IPT at key project milestones to assure compliance against JSP520 requirements.

2.1.4 The SofS, through 2nd PUS has issued a letter of delegation to the DOSB chairman authorising the promotion of policy and standards for safety management systems within the OME functional domain and where the DOSB deems it necessary, to introduce systems of assurance and permissioning, which are at least as good as statute. Therefore in accordance with Health and Safety Commission (HSC) guidelines (Ref. 20), the following terms have been adopted to reflect the activities performed on behalf of the DOSB which provide it with assurance

- **Permissioning Regime** is the full regulatory process that is put in place by MOD to meet the direction of the SofS, to secure the systematic management of hazardous activities throughout the life cycle, 'cradle to grave' and thereby provide assurance.
- **Permissioning** refers to a discrete activity within a permissioning regime, linked to a specific milestone that requires positive action by the Regulator to permit (or permission) the start or continuation of an activity that is conditional upon an endorsement of a Safety Case Report (SCR). The term permissioning is not exact and not all regimes may require explicit consent ... nonetheless in this case it is not possible to operate without documenting the hazards, risks and control measures and presenting arguments justifying their identification to the satisfaction of an independent health and safety assurance body.

2.2 JSP520-applied Systems and Equipment.

2.2.1 JSP520 shall be applied to assess the inherent OME safety of any equipment or system that satisfies the following AOP-38 (Ref.6) definitions of OME:

- a. All Conventional **Ordnance** systems (weapon systems with their associated explosive munitions and auxiliary materiel needed to fire the munition).
- b. **Munitions**. Defined as an equipment forming a complete device, (e.g. missile, shell, mine, demolition store etc.) charged with explosives, propellants, pyrotechnics, initiating compositions for nuclear material, for use in connection with offence, or defence, or training, or non-operational purposes, including those parts of weapon systems containing explosives.
- c. Any other explosive device not a munition. An **Explosive** is a substance (or a mixture of substances), which is capable by chemical reaction of producing gas at such a temperature and pressure as to cause damage to the surroundings. The term "explosive" thus includes all solid and liquid materials variously known as high explosives and propellants, together with igniter, primer, initiatory and pyrotechnics irrespective of whether they evolve gases (e.g. illuminants, smoke, delay, decoy, flare and incendiary

compositions). For the purposes of the OME SMS policy, the definition of Explosives extends to novel materials designed to create an explosive effect.

2.2.2 The application of JSP520 is therefore not limited to weapon systems, and applies irrespective of the intended purpose of the system. It is the responsibility of the OME IPT to assess the inherent safety of all such OME when it is owned and/or operated by or at the direction of the MOD (including contracted services). The OME IPT shall also ensure that the assessment identifies those operating environments and stimuli with the potential to jeopardise the safety of the OME, passing that information on to other Duty Holders and users with control over the operating environments to which the OME is exposed.

2.2.3 Whilst the processes and requirements mandated within JSP520 are sufficiently generic to apply to the majority of OME systems, there may be instances where initial Risk Assessments infer that some of the JSP520 requirements may not be appropriate. This is particularly relevant to systems reliant on novel technologies and compositions, in which case the OME IPT shall apply the fundamental JSP520 processes and justify which requirements are not valid in their submission to the OSRP.

2.3 Inherent OME Safety

2.3.1 Inherent OME Safety is defined as the reduction of risks resulting from, and having an effect upon, the safety of the explosive component(s) of Munitions or higher level Ordnance systems. Inherent OME hazards can be classified into four groups, namely:

- a. Intrinsic hazards - those hazards presented by the explosive material in its quiescent state, such as toxicity, composition breakdown, gas/heat generation, material incompatibility etc.
- b. External and internal hazards which could initiate the explosive component or have an adverse effect on the firing chain, such as spurious fire commands, EMC/E³ (Electro Magnetic Compatibility/ Environmental Electromagnetic Effects) emissions, temperature/drop/shock/vibration, firing chain failure, aerodynamic heating, fragment and bullet attack etc.
- c. Hazardous consequences of initiation and partial initiation (whether intentional or unintentional) of the explosive component, such as blast, fragment, noise, toxic efflux, heat etc.
- d. Post launch and dynamic safety hazards such as loss of guidance control, unintended launch, ricochet, early burst, etc.

2.3.2 The Safety Assessment process shall apply a top-down approach. In general, the safety of ordnance cannot be assessed independently of its munitions or explosive component. Where safety assessments are performed at the system level, hazards and risks identified in lower-level OME components shall be integrated into this system-level assessment.

2.3.3 Whilst the OME IPTL is responsible for all safety issues associated with the equipment, those hazards which fall outside the aforementioned definition of inherent OME safety (para 2.3.1) should be managed in accordance with the overarching domain-specific safety JSP applicable to the particular service operating environment(s). Risks which might be further mitigated at a higher system or platform level shall be clearly identified as a hazard footprint and, where appropriate, addressed at that level.

2.3.4 Where ordnance systems comprise a number of equipments and sub-systems which are the responsibility of more than one OME IPT, Senior Managers are authorised to appoint a Principal Duty Holder with overarching responsibility for co-ordinating and resolving pan-IPT safety issues. Wherever a safety case covers entire weapon systems, wider combat systems or platforms, the interfaces shall be assessed for requirements and risks, which impact on the OME. The SMS shall be managed in accordance with the requirements of both this JSP and the overarching domain-specific safety JSP applicable to that operating environment(s).

2.3.5 Figure 1 below illustrates the typical relationship between a Naval Gun system (ordnance-level safety case) together with its munitions and explosive components, and in turn their relationship with the Platform. The shaded areas within the example provided demonstrate a typical interface between an OME system and the wider system or platform safety case, irrespective of service domain and Operating Environments:

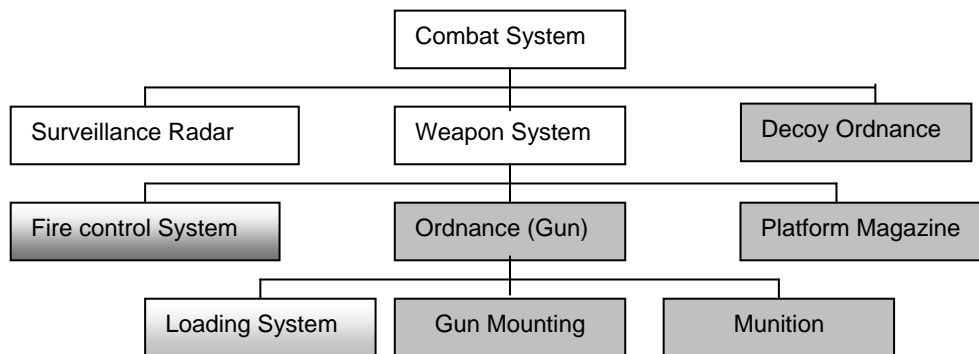


Fig 1. Example of Hierarchical Equipment Structure for Safety Case Construction

2.3.6 The responsibilities of each stakeholder in the OME SMS are laid down in Section 7.

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3. PRINCIPLES and INTERFACES

3.1 Core Safety Management Principles

3.1.1 The three domains in which MOD equipment operates pose a wide range of differing threats, and consequently the safety management systems published for each functional safety domain describe systems with a correspondingly wide range of technical requirements. Underlying these requirements, though, is a common risk-based approach based on five main elements:

- a. **Safety Management System (SMS)** – the specific organisational structure, processes, procedures and methodologies employed to direct and control activities that meet defined safety requirements throughout acquisition.
- b. **Safety Management Plan** – defines the organisational structure of the SMS for an individual Project. It includes the safety-related time scales, milestones and targets to which the project will be adhering throughout the system life cycle.
- c. **Safety Requirements** – a set of requirements designed to demonstrate compliance with legislation, statute, policy and standards are managed and any changes are monitored for safety impact.
- d. **Safety Case** – a robust body of evidence that supports safety claims by recording and demonstrating how safety requirements are met and risks have been managed, will be reduced and are being maintained to levels broadly acceptable or tolerable and ALARP.
- e. **Safety Case Report** – a summary of the safety case produced at key project milestones in the form of a stand-alone report.

3.2 Core Safety Assessment Requirements

3.2.1 Duty Holders shall adopt a risk-based safety management approach to system design and through-life management. They shall demonstrate in their safety case and SMS details of their system, its manner of operation, and the operating environments to which it will be subjected. They shall begin implementation of processes which shall identify hazards and provide an assessment of that OME's response to a wide range of credible stimuli at the earliest possible stages of the project. In turn, they shall evaluate levels of risk presented by the OME and consider reduction of those risks using suitable methods to control consequence and/or likelihood, and seeking appropriate advice from OME Safety Advisers and Subject Matter Experts. They shall consider the balance between operational benefits and options for mitigation, by avoiding the imposition of inappropriate controls that can sometimes result from prescription and justify their decisions accordingly.

3.2.2 All Duty Holders are permitted to assess the use of novel approaches which previous-practice may not accommodate. A risk-based approach does not preclude the use of approved deterministic design standards, but reliance on such standards shall be justified as best practice and the tolerability of resultant risk through compliance established or reduced to ALARP as necessary.

3.2.3 The MOD's preferred standard for contracting for safety management is Def Stan 00-56 (Ref.7), Safety Management Requirements for Defence Systems, which provides requirements and guidance on the core elements, activities and outputs of the safety management process to comply with this policy. It is important to recognise that Def Stan 00-56 is not prescriptive, and that the processes and procedures that it describes set a framework for compliance with this policy. Similarly, the DE&S's preferred standard for IPTs meeting the requirements of this policy is the POSMS and POEMS (Ref.8).

3.2.4 Irrespective of the standard selected each Duty Holder shall adopt a risk-based approach, with suitable emphasis placed by the IPT on the level of scrutiny that is appropriate and in proportion to the level of risk presented by the subject equipment, system or platform. They are also to take into account any existing safety pedigree that can be ascertained from historical in-service data (defects, faults and incidents), previous best-practice or read across by a competent person or body from similar equipment or systems, by applying the principles of proportionality. Further guidance is provided in Part 2 of this JSP.

3.2.5 The Duty Holder shall demonstrate a structured, systematic approach to safety management, starting with the setting of high level safety goals, the identification of hazards, followed by the estimation of risk levels and finally the reduction of risk to levels As Low As Reasonably Practicable (ALARP) and

tolerable. Def Stan 00-56 (Ref.7) and Part 2 of this JSP provide full details of such a safety management approach centred around the following key elements:

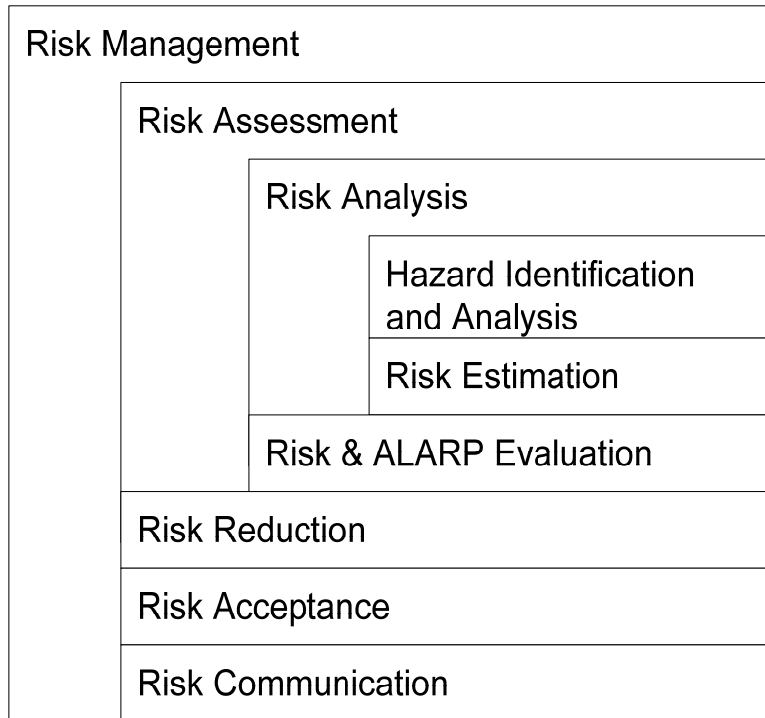


Fig 2. Key elements of the Risk Management process

3.2.6 The evidence generated by the safety management process shall be the backbone of the safety case, and, wherever practicable, the Duty Holder shall select common processes regardless of the domain in which the equipment will operate. The interrelationships with JSP520 and JSPs 454/430/553 (Refs. 3 to 5) are summarised below:

- a. **JSP454:** defines the safety management requirements for all systems and equipment used in the Land operating environment, through-life. For OME used on, or fitted to land platforms the inherent OME safety shall be assessed against JSP520 as a prerequisite of the JSP454 Operational Safety Endorsement (OSE) and as part of System Acceptance. The Land Systems IPTL is ultimately responsible for the integration of the safety cases of all equipment fitted to their vehicle/land-based system/weapon, including all OME fitted or carried as cargo. The outputs from this process shall support any higher systems safety case.
- b. **JSP430:** defines the safety management requirements for ship platforms, systems and all equipment in the maritime operating environment, through-life. For all OME embarked on JSP430 vessels, the inherent OME safety shall be assessed against JSP520 and the maritime interface specified in the Generic Naval Environment. The Maritime Platform IPTL is ultimately responsible for the integration of the safety cases of all equipment fitted to their vessels, including all OME. Combat System IPTLs have similar responsibilities relating to the safety of equipment that comprise their systems. The outputs from the OME SMS process will support subsequent Naval Authority (Explosives) activities, which assess and certify the integration of OME into a specific Platform operating environment.
- c. **JSP553:** defines the safety management requirements for all Platforms, systems and equipment used in the Air Operating environment, through life. The Platform IPTL is ultimately responsible for the integration of the safety cases of all equipment fitted to their Aircraft/Unmanned Air Vehicle, including all OME. For OME fitted to aircraft, the inherent OME safety shall be assessed against JSP520 as a prerequisite to the subsequent JSP553 process for Guided Weapon Release, Generic Aircraft Release Procedure (GARP), covering the Airworthiness of all Ministry of Defence Aircraft.

3.3 OME Safety Management System

3.3.1 In addition to the Core Requirements of Sections 3.5 to 3.7 and Section 4, the MOD's OME SMS shall supplement the activities mandated by the three domain-specific safety JSPs, building on the processes and evidence that will result from their application.

3.3.2 OME SMS activities can be classified into two groups: Implementation and Assurance.

- a. Implementation functions as described in this JSP are predominately performed by the OME IPT, and involve putting in place and conducting activities that assess and reduce the inherent safety risk of the OME equipment or system for which they are responsible. The relationship between the IPT and the OME Safety Adviser² is such that they cannot be considered independent of each other. Consequently, an OME Safety Adviser's role is one of Implementation.
- b. The Assurance function is provided principally by DOSG, who generate policy, audit against the policy and provide independent review by the OSRP of safety documentation produced to demonstrate compliance with the policy.

3.3.3 Progress towards achieving full implementation of inherent OME safety shall be summarised in an OME Safety Case Report (OME SCR) at key Project milestones, supplemented with JSP520-specific outputs as detailed in this document. In conjunction with the IPT's corresponding OME SMS and associated documentation, the SCR shall also form the basis of assurance through an independent specialist review conducted by an OSRP, convened by Director DOSG. The OSRP shall seek to review the evidence and arguments presented by the IPT to demonstrate that adequate progress is being made towards reducing the risks to ALARP and tolerable levels, identifying any significant shortcomings and safety concerns. If the OSRP concludes that the submission satisfies the requirements of JSP520, the output of the OSRP review will be a Certificate of Safety OME (CSOME), which records an independent assessment of progress towards inherent OME safety. The inherent OME safety arguments presented within the IPT's OSRP submission are independently assured by the OSRP process, and will result in a CSOME when the OSRP is satisfied. The CSOME may additionally be an essential prerequisite of permissioning and certification regimes operated by other authorities responsible for approving the storage, handling, transport, embarkation and use of OME.

3.3.4 The minimum baseline documents to be referenced when defining any OME SMS shall include inherent safety requirements arising from:

- a. **The Weapon Systems Design Guide**, Def Stan 07-85 (Ref.9), is written by the Joint Technical Requirements Committee (JTRC³) as the primary design standard for all OME and incorporating Ordnance Board (OB) Pillar Proceedings and other historic best-practice. The Duty Holder shall ensure their design adopts the principles of safe design and the key requirements specified in Part 1 of this standard (irrespective of country of origin) and the suite of national and international OME standards which it signposts, documenting this review within their safety case.
- b. **The Dangerous Air Cargo Regulations**, JSP335 (Ref.10), are written under the authority of the Dangerous Air Cargo Committee (DACC), a sub-committee of the DASB and a specialist sub-committee of the Defence Movements Policy Committee. The OME IPTL shall ensure the safety case considers stimuli from this transportation mode and compliance with requirements promulgated for all personnel concerned with the movement of dangerous air cargo (incl. RAF transport aircraft). The OME IPT shall specify all mandatory controls for the safe carriage of hazardous consignments and collaborate with other Duty Holders to ensure they are contained within their SMS and Safety Instructions and indicate the implications of any deviation from System Operating Procedures (SOPs) in these regulations.
- c. **The Transport of Dangerous Goods (by Road, Rail and Sea)**, JSP445 (Ref.11) provides both Armed Forces and MOD civilian staff with transportation regulations (including OME and radioactive material): written under the authority of the Explosives Storage and Transport Committee (ESTC), a sub-committee of the DOSB. The applicability of JSP445 to the transport of dangerous goods in the maritime operating environment is limited to civilian MOD charter vessels; carriage on all other vessels shall satisfy the requirements of JSP430 (Ref. 4). The

² Provider of specialist OME safety advice who may reside within the IPT or within a support group (principally DOSG). Their role may range from the provision of ad-hoc safety advice to full associate membership of the IPT.

³ The JTRC are the standards sub-committees of DOSB

OME IPTL shall ensure the safety case considers both the stimuli from these operating environments and the regulations pertinent to the carriage of dangerous goods and shall communicate the information to logistics staff.

- d. **MOD Explosives Regulations**, JSP482 (Ref.12), are concerned with the management, storage, maintenance, inspection, processing, handling and disposal of explosives and explosives storage facilities within the MOD, with the exception of activities on-board warships and firing activities on ranges. The regulations are based on mandatory legislation and MOD standards and specify safety principles set by ESTC. The conditions and requirements specified by JSP482 shall be treated as the mandatory minimum safety regime that shall be applied to explosives and associated explosives facilities and equipment in the MOD. The OME IPT's SMS shall ensure that each Head Of Establishment (HOE) supplied the data they need from the safety case and has gained assurance that the facilities available to each OME article may be managed safely. All OME safety cases shall comply with the regulations in JSP482 and associated ESTC standards. All explosives substances and articles shall be classified by the ESTC, in authorised packages and arranged in configurations, which minimise the risk to ALARP. Assessments shall be made of the life cycle implications for safe processing, storage, handling, transportation and disposal while under the control of MOD.
- e. **The Major Accident Control Regulations (MACR)**, JSP498 (Ref.13), defines the MOD's implementation of Control Of Major Accident Hazard (COMAH) for dangerous substances, with its supporting regulations. The Regulations are written by the MACR Competent Authority Support Group under the authority of DOSB. This policy reflects how site-level safety cases, developed by each HOE shall take into account the safety implications of incorporating dangerous substances and should be reviewed during assessment of the OME system safety case by the OME IPT.
- f. **The Defence Land Range Safety Management Procedures**, JSP403 (Ref. 14), is written by the Defence Land Ranges Safety Committee (DLRSC), under the authority of DOSB. (Defence Sea Range Safety is described in BR1043). The OME IPT shall seek advice on the range safety implications of their OME system from each relevant HOE, Subject Matter Expert (SME) and Operating Staff to ensure their acquisition Integrated Trials, Evaluation and Assessment Programme (ITEAP) takes due consideration of safety during tests and trials. Advice shall as a minimum be sought for trials programmes at acceptance, in-service training, post-training and disposal needs. Safety cases shall take account of hazards associated with training on land, sea and air ranges and other training areas.
- g. **The Regulations for Military Lasers**, JSP390 (Ref.15), is written under the authority of the Military Laser Safety Committee (MLSC), a sub-committee of the DOSB. The OME IPT shall ensure the Ordnance safety case incorporates the laser safety case and complies with requirements promulgated for all personnel concerned with the use and integration of lasers. They shall specify all mandatory controls for the safe use and collaborate with other Duty Holders to ensure they are contained within their SMS and Safety Instructions and the implications of any laser certification.
- h. **POSMS/POEMS** (Ref.8) are the DE&S's business procedures for compliance with this policy, requirements of the DOSB and other functional safety boards. The OME IPT is encouraged to use these documents to assist them in generating suitable and sufficient evidence within their OME safety case and their SMS. The OME IPT shall specify all mandatory controls for the safe use of OME and collaborate with other Duty Holders to ensure they are contained within their SMS and ensure safety information is forwarded to service operating authorities.
- i. **Service Operating SMS**, a range of single and joint-service procedures and Regulations exist, written under the authority of Service Boards and co-ordinated by the Chief Environment and Safety Officers (CESOs). Many components of the SMS will have existed for some time. The OME IPT shall consider how all such operational SMS impact on the assumptions within their systems safety cases. They shall use their safety committee to co-ordinate safety issues between Duty Holders and ensure compliance with requirements for personnel safety and the wider safe use and integration of their OME. The OME IPT shall specify mandatory controls for the safe use and communicate the risks through the Safety Committee. The Operating SMS shall collectively ensure an integrated Safety Management System and proper collaboration between operational Duty Holders.

3.4 Safety Case Hierarchy

3.4.1 The safety requirements of the Land, Ship, Aviation and Ordnance Functional Safety Boards are similar in that each stipulates the need for a single comprehensive, credible and robust safety case for each system or sub-system. However each will vary to reflect the different hazards presented within their respective domains. In the majority of instances, there will be a hierarchy of safety cases, and Duty Holders are required to manage the interface between their own responsibilities and those of other related systems through a proportionate, risk-based approach to safety management. The top level safety case will be for the Land, Sea or Air platform as described in the domain-specific safety JSP above (see Refs. 3 to 5). This platform safety case is dependent on inputs from all lower level systems, one being the weapon systems of which OME is a sub-part. Integration of OME systems and their associated risks onto platforms is a platform responsibility.

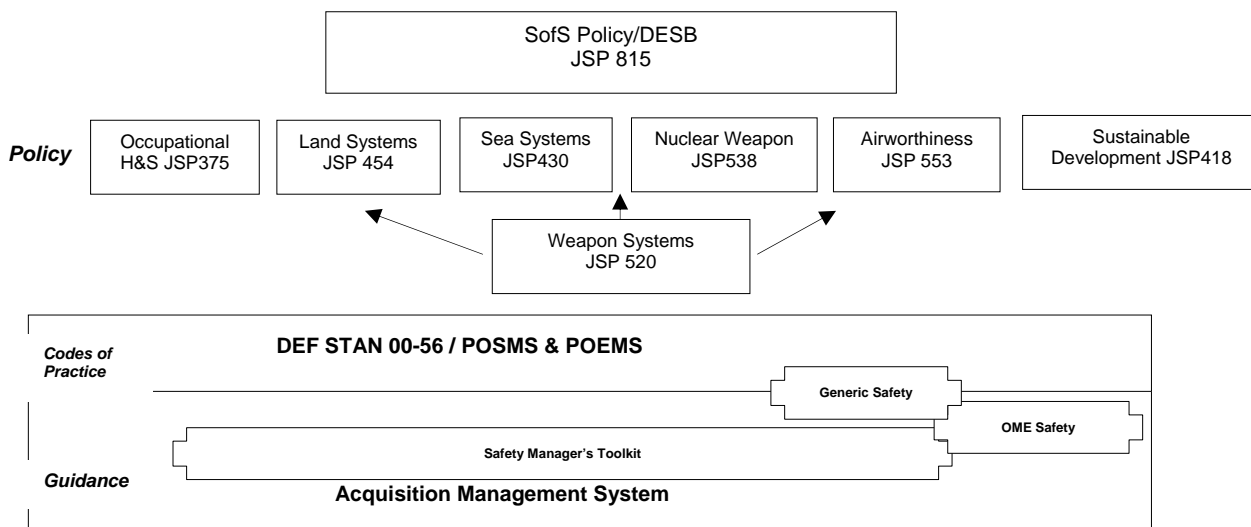


Fig 3. Relationship between safety guidance, codes of practice and policy documentation.

3.4.2 The OME IPT shall prepare a safety case for their system or equipment that complements the higher-level systems or platform safety cases. The aim is to have a seamless flow of safety information between safety cases at successive levels, be it equipment, system or platform. The safety case shall define the system, its boundaries and its operating environment, with all interfaces clearly identified and effectively managed. In order to achieve that, interfaces shall be clearly established and the requirements of the different safety policy documents understood.

3.4.3 Existing safety cases for sub-systems shall be reviewed when changes occur to the operating environment or the role of the subject OME, and the existing arguments justifying the safety claims reassessed. Technologies such as Insensitive Munitions (IM) shall be utilised to reduce risks at OME equipment, system or platform levels wherever reasonably practicable (see Section 3.8, MOD Policy for Insensitive Munitions).

3.4.4 Where no safety case has yet been produced to satisfy the requirements of a domain-specific safety JSP, the scope of the OME safety case should be agreed between Duty Holders. It shall state any assumptions regarding the boundaries of the safety case (e.g. maintenance of power supplies, generation of valid signals) stated. In general, the detail within the safety case should align with and be proportional to:

- a. The scope of the work being carried out
- b. The levels of management control and influence, and
- c. Levels of risk.

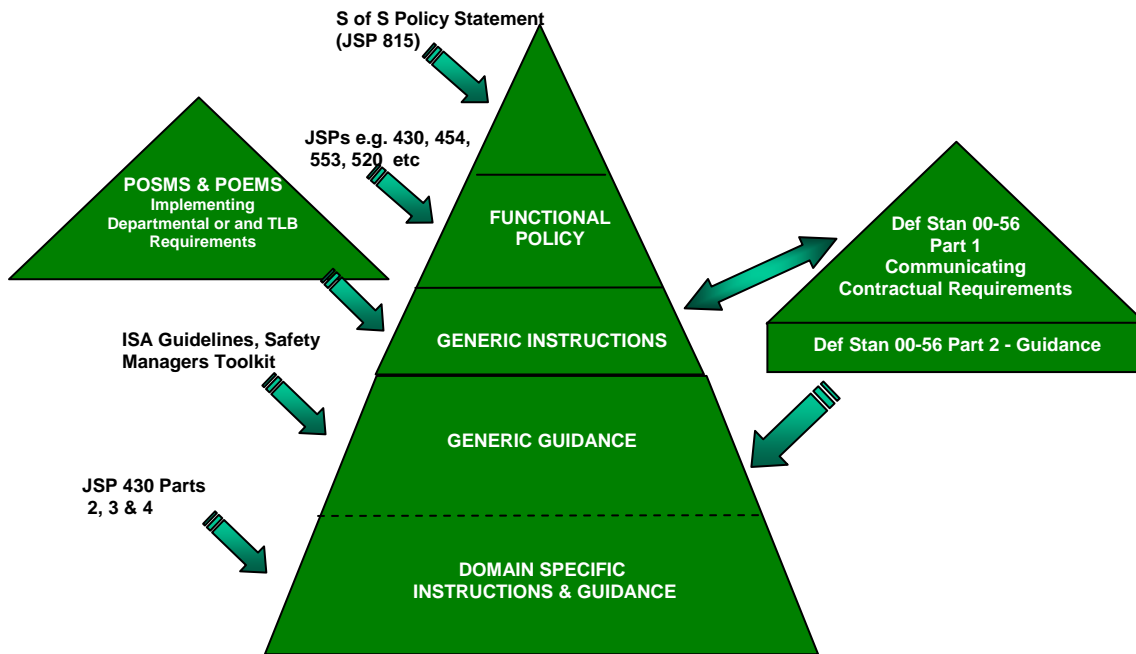


Fig 4. Hierarchical relationship between MOD safety management standards.

3.4.5 The requirements driven by Platform integration issues shall be addressed via compliance with the domain-specific safety JSPs. Where safety evidence is extracted from other systems engineering analysis activities, (e.g. Availability, Reliability and Maintainability [ARM], Integrated Logistics Support [ILS], Human Factors Integration [HFI]) those activities shall be referenced, with a brief argument why the data is relevant and why specific safety assessment was necessary or unnecessary. Wherever a safety case has been limited to a small part or element of the system the OME IPTL has the additional responsibility to:

- a. identify risks which shall be specified in the hazard footprint for control outside the OME SMS at a full Weapon, other System or Platform level,
- b. ensure that these are communicated to the relevant IPTs. In most cases, this will be achieved by including suitable guidance in the OME Safety Instruction,
- c. produce their safety case in a format that enables integration into higher systems.

3.5 OME Safety through the MTDS

3.5.1 MOD safety responsibilities extend across the entire MTDS, necessitating IPTs to establish a safety management approach that addresses specific safety issues particular to each stage. The Safety Assessment shall also consider the integration of all elements necessary to deliver the defence capability, taking account of associated equipment and platforms, personnel training, maintenance facilities, tactics and procedures.

3.5.2 The OME IPTL retains responsibility for ensuring performance against the safety requirements is maintained and where practicable is improved within agreed boundaries. This shall include identifying the Duty Holders and seeking necessary assurance of continuing satisfactory arrangements across the MTDS as well as suitable and sufficient procedures for the modification, upgrade, concessions/production permits and rectification of faults and defects.

3.5.3 The following sections provide further details of the areas that IPTs shall consider when assessing the safety of OME, and the associated standards that apply to each stage:

- a. **Requirements Capture/System Design** - Duty Holders are required to demonstrate a safe design and systems architecture in accordance with def Stan 07-85 Part1 (Ref 9). All requirements shall be periodically reviewed to consider the effects of emerging capabilities

from new equipment, or the application of new/current military thinking, tactics, techniques and procedures on previous assumptions.

- b. **Manufacture** – Duty Holder responsibilities in this phase are limited, but the principles of Corporate Governance require IPTLs to be satisfied that all Duty Holders' statutory duties (e.g. Manufacture and Storage of Explosives Regulations, MSERs [Ref. 16]) are the subject of a suitable and sufficient SMS.
- c. **Storage, Handling and Transport** – Duty Holders are required to demonstrate compliance with the statutory duties and minimum standards for safe storage, handling and transport as outlined in JSP445 and JSP482 (Refs. 11 & 12), and remain compliant throughout their service life. Furthermore, they shall ensure that all MOD explosives⁴ (development and in-service) are classified in accordance with the requirements of the United Nations Recommendations on the Transport of Dangerous Goods as detailed in JSP482 (Ref. 12).
- d. **Trials** - Where trials are performed at the direction of the MOD, whether on contractor's premises, UK or foreign ranges or in the service operating environment, the OME IPTL (or nominated Duty Holder, including the sponsor) shall have a responsibility for ensuring the inherent OME safety of their equipment under trial, within the boundaries of the operating envelope. Duty Holders are to jointly risk assess any operation outside that envelope. Specific requirements relating to Land ranges are published in JSP403 (Ref. 14). Trials involving air-carried munitions shall satisfy the requirements of JSP553 and JSP335 (Refs 5 & 10). For trials or trials series, performed at the direction of MOD and involving the embarkation on, fitting to and discharge of OME from MOD-owned vessels, a pre-requisite of JSP430 (Ref.4) will be the issue of a CSOME based on OSRP review of a formal safety submission. The evidence generated to support trials shall be proportional to the risk, taking cognisance of the known operating envelope, the likely controls and safeguards which will be in place and the likely time at risk.
- e. **In-Service Use (including Armed Conflict and Peacetime)** - The requirement to identify hazards and reduce levels of risk when operating in war and during transition to war remains paramount. Evidence shall be provided within the safety case to demonstrate sufficient design activity has occurred to allow procurement of OME that will be Safe and Suitable for Service (S³) when used within the 'assumed operating environment' (see paragraph 5.3.8 for information on Generic Platform Operating Environments). During peacetime use, limitations, restrictions and safeguards may be applied to satisfy safety criteria. Assessing the acceptability of relaxing these limitations and restrictions in wartime operations can only be made once the increased levels of risk are understood and balanced against the commensurate operational imperative. This requires inputs from multiple Duty Holders. However, the OME IPT shall make inherent OME safety data available to Operational Duty Holders in order to inform the decision whether the operational imperative justifies the higher level risk.
- f. **Maintenance** – The OME IPTL shall be satisfied that suitable and sufficient SMS exists for the safe conduct of maintenance activities. System-specific information shall be supplied where the safety case demonstrates that full compliance with generic manuals, (including precautions required by JSP482, Ref.12) is not reasonably practicable.
- g. **Post Launch Hazards and Dynamic Safety** – The hazards presented by OME post-launch are wide ranging and can be the responsibility of multiple Duty Holders. However, it is the responsibility of the OME IPTL to identify hazards inherent to the design of the OME for which they are the Duty Holder, and communicate where they have the potential to cause harm to MOD personnel, third parties, materiel and the environment. In addition to the consequences of inadvertent initiation, the hazards associated with intentional operation and discharge shall also be considered. Post launch hazards include impacting own forces and third parties, causing environmental damage through pollution, and endangering personnel with discarded debris such as unexploded ordnance and battlefield damage. Inherent dynamic safety concerns the in-flight period within the defined system boundary, for example those hazards which result from either:

⁴ Explosives in this context includes all substances, and materiel containing substances, which are classified as Class 1 in the UN Recommendations on the Transportation of Dangerous Goods. Nuclear weapons containing conventional explosives can only be stored, processed and handled in explosive facilities subject to the conditions of JSPs 520 and 538 (Ref.17).

- i. the ballistic performance of the round (such as deviation from the intended line of flight due to the operating environment, aerodynamic effects or ricochet),
- ii. faults and failures with the potential to adversely affect the performance of inherent guidance, control and targeting systems.

Establishing the consequences and hence the risk of certain post-launch hazards will be dependent on operational issues, particularly during wartime operations, and hence beyond the scope of the OME IPT's safety boundary. In such cases, data provided by the OME IPT will feed into higher-level safety assessments and risk levels determined.

- h. **OME Environmental Issues** - shall be assessed as part of the Risk Assessment process. Safety cases shall include assessments of the hazard footprint calculated according to a suitable Hazard Analysis technique (see Part 2) and inherent risks mitigated and/or the hazard footprint communicated to HOE and other duty holders as appropriate. The MOD Sustainable Development and Environment Manual (JSP418, Ref.2), shall be referenced for MOD Policy and the key activities required to comply with the law and international conventions across all programmes and environmental issues. In addition, the DE&S requirements shall be met as specified in environmental assessments (ASEMS, Ref.8).
- i. **Disposal** – The risks associated with disposal at any point in the project lifecycle shall be established at an early stage and a suitable disposal plan generated. The OME IPTL shall be satisfied that a suitable and sufficient SMS exists to safely conduct any disposal activity and that known hazards and risks are communicated to appropriate Duty Holders. Fully established Explosive Ordnance Disposal (EOD) procedures shall be developed prior to use of the OME, including the identification of any specialist procedures, tools and techniques. Disposal plans shall demonstrate compliance with the core requirements (JSP482 and JSP403, Refs.12 & 14). The term disposal covers a number of scenarios including:
 - i. **Planned Disposal** – The disposal of small quantities of life-expired or damaged stock. Although the operation may be performed by a third party authority, responsibility for assessing the associated risks remains with the Duty Holder, ie the procurement/design authority;
 - ii. **Termination of service** – The end-of-life or logistic disposal of large quantities of stock.
 - iii. **Unplanned Disposal/Emergency Contingencies** – The emergency disposal in situ of items unsafe to move (ie, EOD and Render Safe Procedures [RSP]) ;
 - iv. **Contaminated Land (peacetime)** – Legal obligations in training and storage facilities of obsolete OME and its safety disposal shall be assessed.
 - v. **Battlefield Debris** – Whilst the immediate consequences of the use of munitions may be readily apparent, the risks presented by discarded munitions and fragmented debris are also to be assessed. Legal obligations relating risks presented by discarded munitions and fragmented debris shall be assessed according to Explosive Remnants of War (ERW) and EOD clearance post-conflict requirements.
- j. **Onward Sales** – When OME is passed to third parties for use after its MOD service life, the MOD has a duty of care to communicate what purpose the equipment is fit for and all hazards that have been identified. This may require additional work to establish the integrity of previously conducted assessments (see MLA and Risk Assessment), in particular the validity of assumptions relating to the operating environment and competence of users.

3.6 Application of JSP520 through the Acquisition Cycle

3.6.1 Safety management activities shall be initiated at the earliest possible stage in the acquisition cycle. Where acquisition follows the traditional CADMID cycle, requirements shall be identified for each successive stage, including the specific Implementation and Assurance activities mandated by JSP520 and the wider OME SMS. Precise requirements are detailed in subsequent sections, but summarised below.

3.6.2 As described in subsequent sections, at the early stages of a project the OME IPT shall produce an OME Safety and Environmental Management System, setting safety goals and initiating processes in an auditable trail of evidence that demonstrates compliance with individual goals and processes. This evolving body of safety case evidence shall be used as the basis of successive reviews conducted by both the IPT and the OSRP at key project milestones throughout the acquisition cycle. The processes defined by the OME IPT shall follow the principles within JSP520 Part 2 and should incorporate sufficient flexibility to cope with projects following both a conventional CADMID acquisition cycle or alternate acquisition models such as Off-The-Shelf procurement.

3.6.3 The MOD's considerable inventory of mature OME shall undergo a retrospective assessment process, which places greater emphasis on historical safety pedigree, existing clearances and evidence, together with a new Risk Assessment. However, the basic principles of Implementing and Assuring safety remain paramount. See paras 5.3.11 and 6.6 for further guidance.

3.7 Munitions Life Assessment

3.7.1 Munitions Life Assessment (MLA) aims to promote more effective through-life management of munitions and, as a consequence, the optimisation of munitions' lives. This should lead to capability improvements, a reduction in the quantities of munitions that are demilitarised and in the size of the stockpile. To prevent the disproportionate waste of munitions due to precautionary safety, it is critical that the actual conditions munitions experience during their service lives and the degradation caused to their energetic and other components by temperature, humidity, shock, vibration and pressure are better understood.

3.7.2 Requirements of JSP 762 (Ref.18) specifies appropriate techniques for gathering data on the operating environment and safety through-life are justified in the safety case, with identified risks reduced by protecting munitions from potentially harmful effects of those operating environments. The tools and techniques of MLA shall be applied to all stages of the Acquisition (CADMID) Cycle and the MLA principles for Initial Service Life Trials, Service Life Amelioration Methods and In-Service Surveillance (ISS) implemented. The SMS shall also take due cognisance of the management structures for implementing MOD MLA policy across the MOD.

3.8 MOD Policy for Insensitive Munitions

3.8.1 It is MOD policy to reduce equipment safety risks to levels that are ALARP. Insensitive Munitions (IM) contribute to ALARP through fulfilling their performance, readiness and operational requirements on demand, whilst minimising the probability of inadvertent initiation and severity of subsequent collateral damage to weapon platforms, logistic systems and personnel when subject to unplanned stimuli. NATO nations have agreed a policy for introduction, assessment and testing for IM. These are prescribed in STANAG 4439 (Ref.19), which the UK has ratified.

3.8.2 The MOD Policy Statement is:

- "The vulnerability of the munitions in the MOD inventory will be reduced over time to meet the requirements of STANAG 4439, Ref. 19.
- All new munitions requirements shall stipulate compliance with the IM criteria (Ref.19). Formal dispensation from CM(PA) and Tech Dir is required for any non-compliance, either in the requirement definition or in the procurement solution, in addition to justification within the Risk Assessment.
- All legacy munitions shall be kept under review to identify opportunities to achieve IM compliance and thereby reduce risk. In addition to justification within the Risk Assessment, formal dispensation from CM(PA) and the appropriate DE&S Domain 2* officer is required for any non-compliance, either in the requirement definition or the procurement solution sought for mid-life update, refurbishment or re-provisioning programmes."

3.8.3 The Joint Insensitive Munitions Strategy Group (JIMSG) facilitates implementation of MOD's IM Policy on behalf of DOSB. JIMSG is a pan-MOD/Industry body whose mission is to develop MOD policy for IM, to co-ordinate the implementation strategy and, in particular, to ensure that consideration of potential IM solutions for new and legacy upgrade munitions programmes is given due priority and assessment. JIMSG is supported by 2 sub-groups:

- a. **IM Implementation Strategy (IMIS).** This sub-group is responsible for the production of the IM Insertion Plan, and
- b. **IM Assessment Panel (IMAP).** The IMAP is responsible to JIMSG for providing technical advice on assessment and achievement of IM compliance. Its principal roles are to assess IM test plans before testing commences and to provide consistent categorisation of the IM signature of munitions based on all available evidence. Details of compliance with the MOD IM policy, including a formal IM assessment by IMAP, shall be provided in OME Safety Case Reports.

3.8.5 Once the IM signature of the OME is available, the OME IPT shall conduct a Threat, Hazard Assessment (THA) to populate their hazard log and support their full safety assessment. Results may influence the energetic qualification and classification processes, system architecture, packaging and methods of transportation and use. Risks generated by this risk estimation process shall be evaluated and reduced or accepted as appropriate. Possession of a waiver signifies acceptance of non-compliance and does not remove the duty to mitigate risk to ALARP, nor of the possibility that highly sensitive munitions may not be widely deployable on every platform and could thus have restricted capability.

3.8.6 Further guidance on IM policy and its implementation, including the 2* IM Waiver process for accepting IM risk, can be found in JSP520 Part 2.

4. POLICY AND LEGISLATIVE OBJECTIVES

4.1 Objectives

4.1.1 Each Duty Holder shall comply with the following objectives of the OME SMS which are:

- a. To manage the OME SMS integrally with other safety management processes and as part of a system of systems.
- b. To manage OME inherent safety through all stages of the equipment or system lifecycle, in conjunction with other identified Duty Holders.
- c. To define the roles and responsibilities of authorities and personnel, whether MOD or acting at the direction of the MOD, involved in the management of OME inherent safety.
- d. To define how their evidence of OME safety will be documented in the safety case and its validity maintained.
- e. To identify interfaces with associated authorities and policies.
- f. To comply with the requirements of Sections 4 to 7 of this Policy inclusive.
- g. To comply with DOSB Objectives specified through SMO notices, prior to the issue of formal updates to this policy.

4.1.2 The legal objectives of the OME SMS are:

- a. To ensure, as far as reasonably practicable that the OME is designed and constructed to be tolerably safe, and without risks to health⁵.
- b. To reduce risks to broadly acceptable or tolerable and ALARP. This means that the degree of risk in a particular activity or operating environment, through-life can be balanced against the time, trouble, cost and physical difficulty in taking measures to avoid the risk. The greater the risk, then the more likely it is that it is reasonable to go to very substantial expense, trouble and invention to reduce it, but if the consequences and the extent of a risk are small, insistence on disproportionate expense would not be considered reasonable. It is important to remember that the judgement is an objective one and the size or financial position of the employer is immaterial.
- c. To cross-reference safety and legal reviews for compliance with International Law, including Protocols additional to the Geneva Conventions.

4.1.3 The HSE provides guidance and objectives for tolerability criteria based on the risk of death of an individual and societal risk at a specific site. DOSB may require the Duty Holder with responsibility for the site, as the HOE through the site manager, to meet that criterion or a MOD-derived target. In order to fulfil this function, the HOE relies on the provision of safety information from equipment Duty Holders, presented in a format, which allows the safety performance of that equipment to be established for a specific site.

4.1.4 For OME systems the OME IPTL is the Duty Holder responsible for the inherent safety of the munition or ordnance system and is the Principle Duty Holder with overall responsibility for the OME over its MTDS. Each phase of the MTDS can be considered a site/platform, with its own Duty Holder responsible for meeting the safety requirements at that site/platform.

4.1.5 Each site Duty Holder shall ensure they have control over the normal operating environment at that site and responsibility for any excursions from that operating environment, or communicate when they do not back to the Principle Duty Holder. The OME IPTL shall have responsibility for ensuring the munition remains safe in the normal operating environments and predicting the response of the munition

5. MOD policy on safety and environmental compliance is set out in the Secretary of State's Health and Safety Policy Statement, which can be found in JSP 815. A key element of the policy is that the MOD complies with the requirements of the Health and Safety at Work etc. Act (1974) and other relevant legislation. The main purpose of that Act is to ensure that employers provide a safe working/operating environment for their employees and third parties. In the case of MOD, the latter includes both civilian and armed service personnel. In addition, under Section 6 of the Act, it places particular duties on designers, manufacturers, importers and suppliers of equipment.

in abnormal operating environments and advising appropriate Duty Holders including Heads of Establishments.

4.1.6 Whilst the MOD has no general exemptions from the Health and Safety at Work etc. Act 1974 and much of the associated regulation, it is exempt from the Explosives Acts of 1875 and 1923 (but not successor MSER Regulations [Ref.16]). The MOD has specific exemptions, disapplications or derogation from certain UK or EU legislation, international treaties or protocols. However, the Secretary of State has directed the Department to maintain standards and arrangements which will be, so far as is reasonably practicable “at least as good as those required by UK legislation” or other NATO partner nations, where that sets a higher standard. Where there is no relevant legislation, internal standards will be aimed to optimising the balance between risks and the benefit to capability, the wider MOD, employees and third parties. Compliance with the requirements of the OME SMS is the Department’s response to ensure:

- a. Compliance with applicable legislation and where applicable to be “as good as” comparable arrangements in the civil sector (Ref.1).
- b. Conformance with principles for permissioning higher hazards (Refs. 20 & 21).
- c. Compliance with NATO Allied Ordnance Publication-15 (Ref.22).
- d. Compliance with the Management of Health & Safety at Work Regulations. The SMS has adopted, wherever possible, the principles, definitions and terminology used in other MOD SMS and Ref.23.
- e. The Secretary of State’s requirement to clearly separate responsibilities for those who “Implement safety” and those who “Assure safety”, enshrined in primary statute and the duties of a Ministry of State (Ref.1).
- f. Those Duty Holders are aware of their duty of care for safety, when activities are for and on behalf of the MOD, a liability that cannot be transferred (Ref.1).
- g. That whenever a task is directed by MOD, that the Duty Holder retains sufficient oversight of the Corporate Risks. This is since tasks associated with OME safety may be delegated, but responsibility is retained, irrespective of contractual arrangement, or premises ownership, scope of task capture in the Systems Requirement Document (SRD) or who holds design authority (Ref.1).

4.2 Safety Standards

4.2.1 To comply with Secretary of State’s policy, the MOD requires evidence within the safety case that the management and technical standards adopted by the Duty Holder are consistent with best civil and international best-practice as a minimum. To achieve maximum harmonisation it is current MOD policy to utilise civil standards where appropriate and an agreed hierarchy is as follows:

- a. European standards.
- b. International standards.
- c. UK civil standards.
- d. Commercial standards widely recognised by industry.
- e. International Military Alliance standards.
- f. UK MOD Defence standards.
- g. UK MOD Departmental standards and specifications.
- h. Other Nation’s military standards.
- i. Recognised industry/partnership/consortium standards.

4.2.2 Safety standards shall be selected according to their effectiveness in mitigating risks and their appropriateness to the system and through-life operating environment under analysis. Occasionally civil standards do not meet the specified safety requirements, sufficiently mitigate risk, or undermine capability. Duty Holders are then to follow an appropriate military standard selected from the next higher level of the standards hierarchy. All requirements shall include a survey, verification and validation regime, to ensure continued compliance with the selected standards, proportionate to the risk. Further guidance on standards is available from the Defence Standardisation Organisation (DStan).

5. OME SAFETY IMPLEMENTATION ACTIVITIES

5.1 OME safety management activities can be classified into two groups, namely Implementation and Assurance. Assurance activities are described in Section 6; the following section deals with Implementation.

5.2 Implementation activities are those with a direct affect on the safety of the OME equipment or system, involving the specification, procurement, use, ownership and management of the subject OME. As a general principle, authorities responsible for Implementation cannot subsequently Assure that activity. The authorities primarily responsible for satisfying OME Safety Implementation requirements are the OME IPTL and the OME Safety Adviser, although other sources of specialist OME safety advice also perform an Implementation role.

5.3 Primary OME IPT Implementation Activities:

The primary Implementation activities conducted by the OME IPT shall include:

5.3.1 Establishing requirements

5.3.1.1 Each Duty Holder shall identify safety requirements, in consultation with their Equipment Capability Customer where appropriate. Safety assessments shall be initiated at the earliest possible stages of the acquisition cycle, addressing the different issues that arise as the Project matures, or requirements alter, throughout the acquisition cycle.

5.3.1.2 Initial safety requirements shall be developed according to sound design practice or standards such as Def Stan 07-85 (Ref.9), with particular emphasis on specifying those safety requirements arising from safety legislation, regulations, standards and MOD policy. Where production of the safety case is contracted out, recognition of contractual requirements shall also be given, in accordance with Def Stan 00-56 (Ref.7).

5.3.1.3 For areas of design which are not regulated, appropriate Subject Matter Experts shall be consulted for advice on best-practice and the availability of standards and procedures appropriate to the requirements selected. Adoption of alternative standards to those usually selected shall be justified within the safety case.

5.3.1.4 Requirements shall cover the entire system, throughout its acquisition cycle and across the entire MTDS, with due regard for military effectiveness and the system's Safety and Suitability for Service (S³).

5.3.1.5 The safety requirements allocated to complex equipment and components, including electronic elements should be progressively refined to a level of detail that is sufficient to specify and perform verification and validation of both software and hardware, and energetic components, proportionate to the risks.

5.3.2 Generation of IPT OME Safety and Environmental Management System.

5.3.2.1 All IPTs shall satisfy the requirements of the domain-specific safety JSP relevant to the operating environments for that OME's use, transportation and storage, by working within a robust integrated SMS. The SMS shall generate safety requirements, specify the process employed by the IPT to manage the safety of the equipment being procured or operated, and define responsibilities of personnel employed in the process. For JSP520-applied systems, the SMS shall also provide a description of the IPT's system for managing inherent OME safety and complying with the requirements of JSP520. This may be in the form of a stand-alone IPT OME SMS or as an annex to the main document.

5.3.2.2 The IPT's OME SMS shall be established at the initiation of a Project, and shall be maintained, reviewed and updated through-life. It shall demonstrate that the OME IPT is aware of its OME safety management responsibilities, the essential outputs and endorsements which shall be generated and obtained throughout the project lifecycle, and the mechanisms and resources employed by them, by HOE and others to achieve the mandatory objectives. The SMS will form the basis of OSRP review at Initial Gate and may be audited by the OME Safety Management Systems Auditor at any time.

5.3.2.3 Guidance on producing an IPT OME SMS is provided in Part 2 of this JSP, the content of which assumes the existence of an overarching IPT SMS. Where no such document exists, the OME IPT shall incorporate the additional requirements specified in Def Stan 00-56, POSMS or similar to produce a comprehensive SMS.

5.3.2.4 The OME IPTL shall ensure that a safety committee is established that includes co-operation of all relevant stakeholders including the Contractor. The safety committee shall oversee, review and endorse safety management and safety engineering activities. Input from all stakeholders will be required to enable a demonstrably safe system to be produced. The safety committee shall identify hazard owners to implement measures and to ensure that effective stakeholder involvement during the risk management activities.

5.3.3 Allocation of OME Risk Level Category

5.3.3.1 OME IPTs shall allocate an OME Risk Level Category to all OME prior to OSRP assessment. This Risk Category will determine the level of effort and resources applied to the management of OME safety and the extent of the review exercised by the OSRP. The allocation of the OME Risk Level Category is a subjective judgement made by the IPT in conjunction with the OME Safety Adviser and will depend on;

- a. Worst case consequence following an incident.
- b. System maturity and certification.
- c. Energetic materials.
- d. Munition complexity.
- e. Public acceptability..

5.3.3.2 It is acceptable to change the OME Risk Level Categories as a project progresses through the acquisition phases, when the number and category of risks reduce as mitigation is introduced. Similarly, initial pessimistic assessments may be revised as voids are closed and more information becomes available. Conversely, the OME Risk Level Category may rise as new risks are identified or risks prove higher than initially assessed.

5.3.3.3 Detailed guidance on assigning OME Risk Levels is provided in JSP520 Part 2

5.3.4 Conducting trials and assessments

5.3.4.1 Evidence is required to support the risk assessments and justify ALARP statements. Where this evidence cannot be obtained from alternative sources, and with due regard to the proportionality of the risk, trials and assessments may need to be conducted. These should be combined into cost-effective safety trials and assessment programmes and form part of the ITEAP.

5.3.5 Assessing safety and suitability for service, including:

- a. Software integrity.
- b. Fuze design.
- c. Material toxicity.
- d. Impulse noise.
- e. Human Factors.

5.3.6 Production of the OME Safety Case Report

5.3.6.1 MOD policy stipulates that a robust body of safety evidence termed a safety case shall support all equipment operated by or at the direction of the MOD. The detailed content of MOD safety cases is dependent on the domain in which the equipment will operate (Land, Sea or Air), and defined in the relevant domain-specific safety JSP (Refs. 3 to 5). Whilst these policy documents are optimised for their particular domain, they share a common structure and approach. It is from this body of evidence that the OME SCR shall be generated. The OME SCR shall provide a status report on the OME safety activities undertaken to that point, summarised in a format suitable for independent review by an OSRP (see Part 2 of this JSP for further guidance). If the OSRP is satisfied that the submission fulfils the requirements of JSP520, the outcome will be in the form of a CSOME. Exceptionally, if the OSRP is not satisfied with the submission, the OME IPTL will be formally informed of the panel's decision and reasons for rejection in writing.

5.3.6.2 OME SCRs shall be produced at Key Project milestones in the acquisition cycle from Initial Gate onwards, and shall be based on safety information taken from the safety case. It shall demonstrate OME

system safety performance against the OME Safety Requirements specified for that system and those specified by this policy JSP. The basis of the SCR produced at Initial Gate shall be the IPT's OME SMS. As the Project matures, subsequent SCRs shall summarise the results of the formal safety assessment activities conducted by the IPT. It shall provide compelling evidence that the OME system complies with relevant legislation and that appropriate OME safety risks are ALARP throughout the MTDS when operated within agreed boundaries. Those risks that can be further mitigated shall be clearly identified. In addition, the report shall show that the OME IPTL is managing safety in a robust, positive manner and managing their safety responsibilities (Section 7).

5.3.6.3 The assessment of safety relies upon a system-based hierarchical approach, with safety established at successively higher levels from component to equipment, subsystem and system. For example, for an equipment that satisfies the AOP-38 definition of Ordnance, the safety assessment shall be conducted at a system level, integrating the results of prior assessments carried out on lower-level components (including munitions) to establish the overall level of system safety. Consequently, in the majority of cases, a system-level assessment can only be conducted after the safety of the lower-level explosive components has been established. The overall safety of weapon systems shall follow the hierarchical approach by assessing the interaction of all systems with the potential to influence the inherent OME safety, including safe operation and suitability for use (S³). A standardised format for all OME SCRs is provided in Part 2 of this JSP.

5.3.6.4 The OME SCR shall include references to relevant clearances and certificates which support introduction into service, including:

- a. ESTC Hazard Classification.
- b. Explosive qualification.
- c. Range safety measures.
- d. Laser safety certification.
- e. IM assessment.
- f. Dangerous Goods by Air Carriage (DGAC) clearance.
- g. Aircraft Weapons Air Carriage and Release (Aircraft Self Damage [ASD], Thermal Effects on Airborne Conventional Armament Stores and Equipment [TEACASE] and Aircraft Weapons Ballistic Committee [AWBC]).
- h. Logistic Parachute Delivery Clearance, commonly known as Air Drop Code.

5.3.6.5 As a minimum, the following documentation shall be generated by the OME IPT and/or referenced in the OME SCR, as explained in Part 2, prior to introduction into service:

- a. Explosive Hazard Data Sheet (or equivalent).
- b. Environmental Hazard Analysis or Environmental Impact Screening and Statement.
- c. IPT OME Safety and Environmental Management System.
- d. OME Safety Instruction.
- e. Appropriate operating environment statements e.g. NAES form (for OME to be used in the Maritime environment).
- f. Explosives compatibility matrices.
- g. In-Service Surveillance Plan.
- h. Disposal Plan.

5.3.6.6 The majority of in-service OME pre-dates the introduction of JSP520 and can be classified as Mature equipment. Whilst the requirement for Implementation and Assurance applies equally to these systems and equipments, OME which is low risk, non-complex may be assessed in accordance with the fast-track Legacy OME process described in Section 6.6.

5.3.7 OME Safety Instruction

5.3.7.1 A digest of essential safety information shall be produced for all authorities involved throughout the MTDS in the operation, processing, maintenance, storage, transportation and disposal of the subject

equipment. It shall be produced to the format defined in JSP520 Part 2, and forms part of the OSRP submission. The Instruction shall include a list of any limitations and specific operating instructions necessary to manage system safety risks. Responsibility for maintaining the information contained in the Safety Instruction and ensuring that it is available to the pertinent authorities rests with the OME IPTL.

5.3.8 Generic Platform Operating Environments

5.3.8.1 All OME shall be assessed against their MTDS. In addition, OME embarked on or operated from JSP430 vessels shall be assessed against the Generic Naval Environment (GNE) as defined in Ref.4/Ref.24. This involves the completion of a Naval Environment Assessment Statements (NEAS) form which indicates the degree to which the OME satisfies the GNE and areas of non-compliance. The completed GNE form forms part of the IPT's OME SCR submission to the OSRP.

5.3.9 Legal Review

5.3.9.1 A formal requirement in all research programmes is for the Duty Holders to identify possible health, safety and environment implications of the technology or programme, and to ensure that offensive use of the weapon system and doctrine is compliant with Geneva Conventions and other international laws relating to war. These shall be presented (at a minimum) in the final report/presentation for project approvals and acceptance into service. This will be centrally mandated through the RAO and Joint Doctrine and Concepts Centre (JDCC) Legal. The aim of this activity is a baseline identification of possible problems which can then inform, for example, concept phase down-selections. The extent to which the identified problems need to be pursued is a case-by-case judgement within the safety assessment and shall be proportionate to risk.

5.3.10 OSRP Submission

5.3.10.1 The OME IPTL shall present submissions for OSRP review at key project milestones throughout the acquisition cycle, or at any other time to provide confidence in the IPT's Project safety programme. Submissions shall be presented under a covering letter, signed by the OME IPTL or by a member of staff with formally delegated safety responsibilities. The covering letter shall:

- a. Take ownership of the safety case report by the Duty Holder.
- b. Define the OME for which review is sought.
- c. Describe the interfaces between the subject OME and the wider system.
- d. Reference all supporting documentation provided for review.
- e. State the operating environments, including transportation modes (Land/Sea/Air).
- f. Provide the date by when the OSRP review is to conclude.

The content of the submission may vary according to a number of factors; further guidance is given in Part 2 of this JSP. Full details for OSRP submissions are provided in Section 6, OME Safety Assurance Activities.

5.3.10.2 Where an Independent Safety Auditor⁶ (ISA) is appointed by the IPT, all relevant conclusions drawn from audit reports shall be included in the OME SCR to provide support to safety arguments and declarations.

5.3.10.3 The OME SCR shall provide sufficient detail to satisfy the OME Safety Review Panel that residual risks are in the tolerable region and that the ALARP arguments are comprehensive, credible and robust, and where practicable that the system complies with relevant legislation and standards.

5.3.10.4 DOSB requires that the status of all OME systems are monitored (see 6.3.3.4) for their compliance with permissions given and where the Duty Holder chooses to manage an operating profile outside that independently reviewed, that the basis is justified. In support of this, DOSG shall maintain an OME System Safety Clearance Register, and report any significant shortfalls to the DOSB.

⁶ Refer to Defence Standard 00-56 - Safety Management Requirements for Defence Systems, Ref.7

5.3.11 Mature OME Systems

5.3.11.1 Mature systems are defined as those that passed Main Gate (or, in the case of Off The Shelf acquisitions, entered service) prior to January 2002. The requirement for all equipment used by and at the direction of the MOD to have a safety case applies equally to mature OME systems, and sponsors of such equipment shall develop a retrospective safety case. Whilst the methodology for assessing and reducing levels of residual risk applies equally to new or mature systems, the IPT should make use of in-service evidence and pedigree to support safety claims wherever possible. The OSRP requirements for mature systems are no different than those for new-to-service equipments, although a streamlined OSRP process applies to stores which satisfy the specific criteria stipulated in para 6.6. The streamlined process is termed the Legacy Process.

5.3.11.2 As the Duty Holder responsible for inherent OME safety, the OME IPT shall maintain the safety case to ensure the continued validity of the content. Where changes occur which have an effect on the inherent safety of the subject OME, risks shall be assessed and the safety case updated accordingly. Updates to the safety case may occur for many reasons, including modifications to the equipment design or construction, changes in the way the equipment is used and operated, and the emergence of new data relating to the behaviour of the energetic material. Having reassessed the safety of the OME, the OME IPT shall approach the OSRP secretariat, via their OME Safety Adviser, as described in para 6.3.3.5 to establish whether a further OSRP submission or certification update is required. This requirement applies to all OME, irrespective of whether it is supported by a current CSOME. Where emergent evidence suggests a potentially significant increase in risk, the OME IPT shall appraise affected personnel and authorities and inform them via the Platform Duty Holder of any additional controls that shall be implemented while risk assessments are conducted. As the imposition of controls may have operational consequences, the release of such information relating to inherent OME safety should be carefully considered and co-ordinated by the OME IPT only.

5.3.11.3 All personnel and authorities with OME safety responsibilities have an obligation to consider the wider implications of emergent data and evidence. In particular, where safety concerns affect components and energetic materials which may be relevant to other systems, information shall be made available to all interested authorities for the implications to be assessed.

5.3.12 Safety of Life at Sea (SOLAS) Stores

5.3.12.1 SOLAS stores are positioned at various points of easy access around a Maritime Vessel e.g. The Bridge and each Life-Boat/Raft has its own dedicated Distress Set, and are used to mark the position of a casualty that is in distress day or night. SOLAS stores are an international requirement for shipping and are extensively tested to the requirements laid down by the International Maritime Organisation (IMO) SOLAS Life Saving Appliance (LSA) Code to ensure Safety and Suitability for a 3 year life.

5.3.12.2 SOLAS stores are commercially available and the MOD is required to procure and manage a range of SOLAS stores. It is policy that the full rigours of MoD specific Safety and Suitability for Service S3 testing are not required for SOLAS stores. However, as the Duty Holder responsible for inherent OME safety the Project Team (PT) must demonstrate to the OSRP that stores procured satisfy the LSA Code and that safety is being managed in accordance with the Core Safety Management Principles.

5.4 Primary OME Safety Adviser Implementation Activities:

5.4.1 Unless the OME IPTL can demonstrate that sufficient OME safety competence exists within their IPT to fully discharge the responsibilities defined in this JSP, they shall obtain external specialist advice. Such advice may be obtained from any demonstrably competent body, but is readily available from within the MOD from the DOSG Weapon Systems (WS) Division.

5.4.2 The appointed OME Safety Adviser, who may be a full or part-time member of the IPT, should be a prominent member of Project Safety Panels and Committees, providing advice on all aspects of inherent OME safety and the OME SMS on an on-going basis. They should be expected to provide formal, written OME Safety Advice before or after significant safety activities including, but not limited to:

- a. The first use of an OME where the safety of the operator or platform could be compromised, advising on the inherent safety for such an activity.
- b. During design or modification of the OME, on the degree of safety afforded by intrinsic safety features.

- c. To recommend safety trial and assessment programmes required to obtain the evidence to support risk assessments and ALARP statements.
- d. On the outcome and analysis of such trial and assessment programmes.
- e. Whenever changes to assumptions arise, for example from evidence read-across from similar systems or technologies, or as notified by Duty Holders.

This advice should also conclude whether or not the inherent OME safety of the equipment has been demonstrated. It should recommend any further safety activities required, any limitations or caveats on safe operation, and a service life. Advice should be proportionate to the risk and shall communicate those risks in a manner understandable to the recipient.

5.4.3 The above safety advice forms an integral part of the OME safety case. Safety Advice as described above should be sought whenever it is possible that subsequent assurance may be necessary and included in OSRP submissions where appropriate. In cases where the advice of the OME Safety Adviser or ISA is ignored, the OME IPTL shall have overwhelming justification for doing so.

6. OME SAFETY ASSURANCE ACTIVITIES

6.1 The requirements for OME safety management activities are in two groups, namely Implementation and Assurance. Implementation activities are described in Section 5; the following section deals with Assurance activities. The management of OME Safety Assurance activities comprises three major elements:

- a. Generation, publication and maintenance of policy, including JSP520 and other OME policies, in partnership with implementers.
- b. Independent review of the inherent explosive elements of OME safety submissions by the OSRP.
- c. Audit against the requirements of JSP520.

6.2 Generation, Publication and Maintenance of JSP520 Policy.

6.2.1 JSP520 policy fits within the structure defined in JSP 815 and those documents with which it interfaces, principally the three domain-specific safety JSPs (Refs. 3 to 5). Whilst it is the role of the DOSG Safety Management Office (DOSG SMO) to manage JSP520 and ensure this alignment is maintained, all users have a responsibility to bring the need for changes to the attention of the document sponsors.

6.2.2 The JSP520 Editorial Committee is a forum established by the DOSB for the specialist review of JSP520 policy and change proposals submitted by users. Where the Editorial Committee considers an amendment to represent a change to policy, it shall ensure that appropriate staffing of the policy change is undertaken prior to seeking DOSB endorsement. Editorial Committee meetings should be convened on an as-required basis, with membership made up of representatives from all users and Duty Holders represented on the DOSB including DOSG. Terms of Reference are provided in JSP520 Part 2.

6.3 Permissioning by an OME Safety Review Panel (OSRP)

6.3.1 The OSRP shall provide assurance of inherent OME safety as a component of the MOD's permissioning regime through independent peer review of OME Safety Submissions produced by IPTs at key stages in a project. This permissioning activity shall supply assurance to the DOSB that IPTs are employing 'due process' to manage OME safety, and that achieved levels of OME safety satisfy the requirements set by the User Requirements Document/System Requirements Document (URD/SRD), JSP520, relevant legislation and standards and can be maintained. In particular, the OSRP will seek compelling evidence demonstrating that the IPT's OME safety risks are reduced to either broadly acceptable or ALARP and tolerable levels on the basis of arguments that are comprehensive, credible and robust. The OSRP shall provide the principal method of monitoring all tri-service OME systems' safety across the acquisition cycle, for subsequent use within other permissioning regimes and to inform business approval milestones.

6.3.2 If the OSRP is satisfied that the submission fulfils the requirements of JSP520, the outcome will be in the form of a CSOME. Exceptionally, if the OSRP is not satisfied with the submission, the OME IPTL will be formally informed of the panel's decision and reasons for rejection in writing. The OSRP process shall be split into three main elements:

- a. Establishing the requirements for submissions to the OSRP: The content, frequency and extent of IPT submissions for OSRP review.
- b. The OSRP Review: Independent review of the OME safety submission by the OSRP, providing feedback and if appropriate issuing a CSOME to the IPTL.
- c. Post OSRP requirements: The IPTL's plan of action to resolve any outstanding issues, and comply with any limitations or provisos recommended by the OSRP.

6.3.3 Requirements for OSRP Submission:

6.3.3.1 The content and format of the OME safety submission will be dependent on a number of factors. These are fully defined in Part 2 of this JSP, and shall include as a minimum:

- a. Stage of acquisition cycle/acquisition strategy.
- b. Type of OME system (Explosive, Munition or Ordnance).

- c. Corporate Risk Level Category.
- d. Urgent Operational Requirements (UOR).
- e. Legacy OME systems.

6.3.3.2 By presenting a submission to the OSRP, the OME IPTL is requesting independent validation that the safety management processes being implemented by the IPT demonstrably satisfy the requirements of JSP520. The OSRP shall also verify whether evidence supporting safety arguments is comprehensive, credible and robust. The submission shall include endorsement of the safety arguments, and shall confirm that the IPTL's wider legal duties and requirements are understood and are being discharged. As the project matures, submissions shall demonstrate that all OME risks are identified and being appropriately managed.

6.3.3.3 OME SCRs produced to support OSRP reviews conducted at the early stages of the acquisition cycle shall focus upon the IPT's OME SMS and requirements capture, which will describe the processes to be followed and provide a description of roles and responsibilities. As the project matures the submissions become more evidence based, demonstrating how safety targets are being satisfied and risks argued to be ALARP.

6.3.3.4 For Projects following the CADMID acquisition cycle, submissions presented to the OSRP shall align with major project milestones. As a minimum, these shall include;

- a. Initial Gate.
- b. Main Gate.
- c. Entry to Service.
- d. Withdrawal from Service.

The OSRP shall seek to review the continued validity of certification at periods not exceeding five years.

6.3.3.5 In addition to these main milestones, the OSRP secretariat shall be notified at any stage of the acquisition cycle where changes affect assumptions about the inherent safety of the system. The OSRP will advise the OME IPT of any action required, which may range from a formal letter notifying the OSRP of the changes to a full resubmission of the safety evidence. This requirement applies to all OME, irrespective of whether it is supported by a current CSOME. Examples of such instances include, but shall not be limited to:

- a. Any major modifications in design, including associated packaging.
- b. Variations to the agreed operational environment, incl. logistic and through-life issues.
- c. Significant Trials Programmes (paragraph 3.5.3d refers).
- d. Changes to legislation or OME policy.
- e. Change of manufacturer or manufacturing process.
- f. Changes to the service depot processing arrangements.
- g. Significant incidents which bring assumptions within the safety case into question.

6.3.3.6 Submissions presented for OSRP review shall include an authorising letter signed by the OME IPTL or by a member of staff with formally delegated safety responsibilities. The letter shall define the OME for which review is sought, reference all supporting documentation provided for review, the operating environments including transportation modes (Land/Sea/Air), and the date by when the OSRP review is to conclude. With the exception of permissioning required to support UORs and Legacy submissions, submissions shall be supported by a Formal Letter of OME Safety Advice produced by the OME Safety Adviser in accordance with paras 5.4.2 and 5.4.3. A period of at least six weeks is required for a full OSRP review: different timescales apply to Legacy and UOR submissions.

6.3.3.7 Documentation submitted to the OSRP may be in any format suitable for review (hard or electronic copy). Failure to provide adequate evidence will result in submissions being returned or timescales delayed while the relevant information is provided. Where an ISA is appointed by a Duty Holder, all relevant conclusions drawn from audit reports and endorsement shall be included in the OME SCR, in support of the safety arguments and declarations.

6.3.3.8 Requirements for Legacy submissions and those required to support UORs are provided below in Sections 6.6 and 6.7 respectively.

6.4 The OSRP Review

6.4.1 Assurance of OME Safety shall be through the independent specialist review undertaken by an OSRP. The OSRP acts on behalf of the DOSB and provides it with assurance of compliance with its policy. The OSRP has the authority to issue permission through its certificates for projects to move to the next phase of acquisition, based on submissions presented (as specified at paras.6.3.3 and 6.5.4). The permission seeks to independently endorse arguments that safety goals and requirements have been met and assure key processes. Head of DOSG, will appoint a Chair of an OSRP Management Board (OSRPMB) by a letter of delegation to manage the OSRP Process. The OSRPMB Chair will appoint competent personnel from within the OME community, to become members of the OSRPMB and personally delegate suitable members as Chair of OSRPs. In the case of Legacy submissions and submissions in support of UORs, the OSRP membership will be taken from a standing panel. Otherwise, the OSRP membership is likely to include:

- a. An independent Chair appointed by Chair OSRPMB, deemed a competent person who is independent of the project under review.
- c. A member of the DOSG SMO to advise on the application of systems safety management processes and overall risk assessment approach.
- d. Relevant technical experts on similar weapon systems design / operation, usually drawn from within OME Safety Adviser or IPT community with the necessary expertise and who are independent of the project under review.
- e. Representatives with other Subject Matter Expertise or from other functional safety areas, where appropriate.

6.4.2 The OSRP secretariat shall conduct an initial assessment to establish whether submissions are suitable for OSRP review. Those that are will be distributed to all members of the OSRP, who will be given sufficient time to review and provide comments on the contents of the submission, prior to the date by which endorsement is required. The amount of time required to conduct the review process will be dependent upon the level and complexity of information provided, but for programming purposes a minimum of 6 weeks shall be allowed.

6.4.3 Depending on the complexity of the OME system and the case presented, the OSRP Chair may conduct the review out of committee in the case of lower risk OME systems, or conversely convene a number of meetings during the review for higher risk systems.

6.4.4 Having completed their review of the submission, all OSRP members shall provide written comments to the OSRP Secretariat using the review template within four weeks of receipt. The OSRP Secretariat, in consultation with the OSRP Chair, shall appraise the comments and queries raised by the Panel members and provide a formal response to the IPT. The IPT shall supply formal answers or further evidence against the comments raised by the OSRP within specified time-scales. At the discretion of the OSRP Chair, a meeting may be convened between the OSRP and representatives of the IPT (including the OME Safety Adviser) to clarify the IPT's response.

6.4.5 If the OSRP is satisfied that the submission fulfils the requirements of JSP520, the outcome of the review shall be in the form of a CSOME. The Chair shall ensure that any limitations, provisos and caveats are clearly identified as part of the CSOME to inform other permissioning regimes. In addition, the CSOME shall state when the OME IPT shall make subsequent submissions to the OSRP for review. If the level of information in the submission is inadequate for OSRP review or to support ALARP and tolerability arguments, the submission shall be rejected and the OME IPTL formally informed of the panel's decision and reasons for rejection in writing. Permission specified in a CSOME can be Full or Limited, the latter being issued for short timescales (typically to covers trials programmes) or where limitations have been imposed by the OSRP.

6.4.6 Where IPTs believe that disproportionate requirements have been imposed upon them, or the OSRP has placed unreasonable conditions with the issued CSOME, the issue may ultimately be raised to the DOSB, through their TLB representative, for arbitration and resolution.

6.4.7 Where IPTs refuse to address the requirements of JSP520, or the OSRP Chairman feels that there are fundamental issues which preclude the issue of a CSOME, the issue should be raised to the OSRPMB and ultimately to the DOSB, through Head of DOSG, for arbitration and resolution.

6.5 Post OSRP Requirements

6.5.1 Any output of the OSRP shall be forwarded directly to the OME IPT for onward dissemination as appropriate. Where the certificate includes limitations, provisos and caveats necessary to manage the OME system safely, the IPT shall ensure that processes are in place to address them either directly or by the SMS maintained by higher systems Duty Holders. Subsequent audits or OSRP reviews shall specifically seek evidence to demonstrate compliance with provisos, caveats and limitations and this evidence may be prerequisites of other MOD permissioning regimes.

6.5.2 Endorsement of the SCR through the issue of a CSOME does not abrogate the IPTL's responsibility for delivering safe systems or the user's responsibility for using the system safely. Certification is also dependent on the accuracy and validity of the information presented for OSRP review.

6.5.3 Triggers which can invalidate a Full or Limited CSOME are detailed in paragraphs 6.3.3.4 and 6.3.3.5. Occurrence of any stated scenario may require further submissions to the OSRP.

6.5.4. Policies and procedures defined in JSP520 relate to inherent OME safety only, and the issue of a CSOME is only the first step in the MOD's permissioning regime. The process of integrating the OME safety case into a specific platform operating environment and its associated safety case, including the issue of relevant certificates to permit use and Release To Service are specified in the domain-specific safety JSPs.

6.6 Legacy OME Process

6.6.1 The vast majority of the OME inventory is made up of in-service mature munitions, defined as those that passed Main Gate (or, in the case of Off The Shelf acquisitions, entered service) prior to January 2002. Whilst the full rigours of the JSP520 OSRP process apply to mature systems, a streamlined, template-based process applies to those mature OME systems that satisfy the following parameters by being:

- a. Non –complex, unguided.
- b. In the low risk category.
- c. In service supported with extant certification issued by an independent MOD safety authority.
- d. Able to demonstrate a high level of safety based on an appropriate level of in-service usage and supported by documentary evidence.

6.6.2 Suitability for assessment in accordance with the Legacy process shall be validated by an OME Safety Adviser and agreed by the OSRP Secretariat prior to adoption.

6.6.3 In the majority of cases, evidence to support an assessment of inherent OME safety as demanded by the Legacy OME template shall already be available to the Duty Holder. However where legal requirements have changed, there may be a requirement to obtain additional information, for example the requirement to provide Explosive Hazard Data Sheets. Where information is unavailable, the Duty Holder shall seek to demonstrate that risks are ALARP without consuming disproportionate resources. As far as reasonably practicable, all aspects of the OME system design and safety history shall be captured in the legacy OME template. All submissions shall be supported by an OME Safety Instruction, providing a technical description and details of safety aspects and associated hazards, or (where available for stores cleared for Naval service) a validated Ship Explosive Store Safety Instruction (SEXSSI), Ref.4.

6.6.4 A period of three months shall be allowed for OSRP review of each Legacy submission.

6.7 Urgent Operational Requirement (UOR) Process

6.7.1 In order to satisfy the short timescales associated with munitions required in support of UORs, an OSRP standing panel has been established. In many cases, timescales prevent the generation of comprehensive safety case reports, and the assessment shall be based upon a review of available evidence, supported where appropriate by read-across from similar equipments and systems. It remains the OME IPTL's responsibility to collate the available data into a form suitable for review, with hazards

identified and risks assessed and reduced to levels ALARP and tolerable. Where there are voids in the evidence, these shall be clearly identified along with the associated risks.

6.7.2 Upon receipt, the OSRP Chairman shall convene an extraordinary meeting of the panel to review the submission and agree a programme to meet the timescales of the UOR. On endorsement of the Safety Submission, Sec OSRP shall issue an appropriate CSOME. It remains a requirement for the OME IPT to generate a safety case for the equipment whilst it is operated in support of the UOR. Requests to extend the validity of CSOMEs shall be dependent upon this activity taking place.

6.7.3 The review period for UOR submissions will invariably be dependent on operational imperatives which the OSRP will strive to achieve. However, it remains the responsibility of the OME IPTL to present cases with realistic, achievable timescales.

6.7.4 Operationally urgent requirements do not always go through the UOR process, but can have the same legitimacy and urgency when endorsed by Customer 2 as an Urgent Statement of User Requirement (USUR); therefore the process defined for UORs can be applied to Customer 2 endorsed USURs.

6.7.5 Although IM Assessment process, see Part 2 Guidance Section 5 Paragraph 5.3.6.4e, is perceived as a long process, an assessment of the IM opportunities associated with any UOR procurement of munitions is required, providing that it does not slow down the UOR process, and the IPT should strive to be aware of the IM signature so that users can be advised of potential risks and suggest mitigation.

6.8 Safety of Life at Sea (SOLAS) Stores Process

6.8.1 SOLAS stores are defined as Low Risk OME Risk Category and shall have been tested to the requirements laid down by the SOLAS Life Saving Appliance (LSA) Code to ensure Safety and Suitability for a 3 year life. Therefore the review will be undertaken by a Low Risk OSRP Panel and the suitability for assessment as SOLAS stores shall be validated by the OME Safety Adviser.

6.9 Audit

6.9.1 Organisations with OME safety management responsibilities shall be subject to periodic audit. Periodicity is dependent on the level of risk perceived or assessed, the value that could be added by the audit process, or as required by management. The purpose of safety audits is to provide assurance of conformance with JSP520 and associated documentation, agreed requirements and relevant legislation and standards. Within the OME SMS audits take place on two levels.

6.9.2 Safety Management System Audits

6.9.2.1 The scope of any audit shall be governed by the objectives of the organisation conducting the audit. Audits shall be undertaken by the DOSG SMO, on behalf of DOSB to

- a. Provide assurance that the requirements of JSP520 have been established and are being maintained.
- b. To establish that the OME SMS is operating effectively in all areas (Operating Procedure 3.7.1).
- c. To make recommendations to auditees to improve the level of compliance and inform continuing development of the policy.

6.9.2.2 To satisfy this requirement, audits of the implementation of the OME SMS shall consider:

- a. Compliance with the requirements of the IPT's own OME SMS and its related documentation, namely JSP520.
- b. Compliance with the limitations, provisos and caveats mandated on the CSOME and the OME Safety Instruction.

6.9.2.3 The DOSG SMO shall prepare an annual audit report covering the findings of audits performed for review by DOSB. The audit process should take advantage of any existing systems of audit. Wherever practicable auditing authorities shall co-ordinate audits to avoid duplication of effort.

6.9.3 Independent Safety Assessors and Auditors

6.9.3.1 Where an Independent Safety Auditor is not engaged by a Material Duty Holder the IPT may conduct audits on contractors using his own audit resource or resource from other Ministry of Defence departments, e.g. the Safety Management Office.

6.9.3.2 Where Independent Auditors have been engaged to standards set within the Safety AMS, those audit findings may be submitted by the IPT to provide assurance to OSRP submissions and to reduce their audit burden.

6.9.4 Conduct of OME Safety Audits

6.9.4.1 Parties conducting audits may include:

- a. Statutory authorities exercising their right of inspection under Memorandums of Understanding with the Ministry of Defence.
- b. Directorate of Safety & Claims as directed by the DESB.
- c. OME SMO on behalf of the DOSB.
- d. Senior Managers conducting corporate audits across their TLB or HLB.
- e. Duty Holders conducting peer review and internal audits.
- f. ISAs on behalf of Material Duty Holders.
- g. Chief Inspector Explosives (CIE).
- h. MACR Competent Authority Support Group.

6.9.4.2 Assurance may be sought periodically by senior managers in accordance with their TLB's internal processes eg, DE&S Project Review and Assurance. Such evidence of a suitable and sufficient SMS shall be acceptable data to OSRPs and may influence the periodicity and level of audit to which the IPT may be subjected.

6.10 Incident Reporting

6.10.1 Timely and accurate reporting of incidents and notification of incidents is an essential element of any SMS. There are a number of mechanisms within the MOD to report and record accident, incident and near-miss information (principally in accordance with JSP482). Those operating SMSs shall ensure that the appropriate mechanisms are incorporated into their SMS and that arrangements exist to record and review the reports. Reviews of accident, incident and near-miss reports shall be a continuous process, the arrangements for which shall be recorded in the Safety Management Plan. Reviews and subsequent decisions about action required shall be managed through the IPT's Safety Committee. Regular reviews of fault, defect and deficiency reports shall also be carried out and reported to the IPT's Safety Committee, to ensure that defects or possible trends in equipment failures do not compromise safety performance (further details are provided in Part 2 of this JSP).

6.10.2 Any incident reports, investigations into defects or results from trials, or other R&D which alter any assumptions within a safety case shall be brought to the attention of relevant duty holders and assurance bodies which those findings may affect (5.3.11).

7. RESPONSIBILITIES AND COMPETENCE

7.1 The effective application of the OME SMS relies on the competence of personnel involved in the process, including those within the OME IPT, the DOSG and the OME Safety Adviser, the OSRP and contractors. Within the MOD, a series of formal letters of safety delegation cascades safety responsibilities to competent personnel. In accordance with both current legislation and statutory MOD regulations, it is essential that delegated safety duties are carried out by Suitably Qualified and Experienced Persons (SQEP) in order to discharge the department's duty of care. A parallel framework of safety responsibilities and competence requirements is operated within the OME SMS for both the Implementation and Assurance activities, with clearly defined demarcation of responsibilities.

7.2 Competence

7.2.1 Health and Safety legislation requires certain duties to be carried out by SQEP. The Management of Health and Safety at Work Regulations (Ref. 23) defines a competent person as *"a person who has sufficient training and experience or knowledge as to enable him to assist in securing compliance, on the part of the employee, with the necessary safety legislation and maintenance procedures"*.

7.2.2 Users of the OME SMS shall operate within the limits of their own competence. Managers are responsible for ensuring that personnel with delegated safety responsibility and authority are suitably qualified and experienced to carry out their duties to meet the statutory, MOD regulatory and technical requirements of their role or post. The relevant functional competencies for key personnel shall be identified and the necessary training provided to maintain competence levels, and to supervise/oversee where individuals require further development.

7.2.3 All OME Material Duty Holders shall attend appropriate MOD Safety Management training. Senior Managers shall attend sponsored half-day Materiel Duty Holder's safety management awareness seminars or an equivalent safety awareness course. Safety competencies shall include an understanding of risk-based safety management methodologies and the methods needed to tailor them to meet specific OME or weapon equipment requirements. All individuals with significant OME safety management duties and/or those claiming to be suitably qualified and experienced (e.g. safety managers/ focal points, OME safety advisers, ISAs, SMEs and contracted staff), shall be audited against the appropriate National Occupational Standards for Explosives criteria.

7.2.4 The competence of those working in Ordnance, Munitions or Explosives (OME) shall be demonstrated against the standards of best practice set by the sector; these are the National Occupational Standards (NOS) for Explosives Substances and Articles (ESA). Line Management is responsible for:

- a. Ensuring competence can be demonstrated to at least that required in the ESA NOS.
- b. Where skill gaps exist ensure positive action is taken to resolve them.
- c. Ensure appropriate records of competence are maintained
- d. Provide reports to the DOSB on the progress of implementation of the NOS.

7.3 Extent of MOD Responsibilities

7.3.1 Duty Holder Responsibilities:

7.3.1.1 The MOD defines a Duty Holder as a person that has been authorised (normally via specific delegation) to discharge a part of the Secretary of State's Duty Holder responsibility. Typically, the term Duty Holder is applied to heads of Establishments, IPTLs, and posts of similar managerial responsibilities within the MOD. The OME IPTL is the Duty Holder with specific responsibilities relating to inherent OME safety across all stages of the acquisition cycle. These responsibilities are discharged through the application of a coherent safety management regime, compliant with MOD-recognised standards, and the generation and subsequent maintenance of a comprehensive safety case. It is the responsibility of the OME IPTL to identify all inherent OME hazards associated with their equipment, and ensure that all risks are reduced to broadly acceptable or tolerable and ALARP levels. Activities to control many of the risks will be under the sole control of the OME IPTL. However, there will inevitably be areas where responsibility for achieving and maintaining ALARP and tolerable levels of risk is shared and transferred between multiple Duty Holders, both within and external to the MOD. In such cases, the OME IPTL is the

custodian of the safety case, responsible for co-ordinating activities and managing interfaces between Duty Holders, through their safety committee.

7.3.1.2 The OME IPT shall liaise with other Duty Holders (Section 3.3) to establish and define the scope and boundaries of the safety assessment, ensure that all credible scenarios are considered and establish levels of risk. The IPT's assessment of Probability and Consequence levels shall be based upon the agreed operational scenarios in which the stores are used, the exposure of personnel to the risks and the rate of usage. Where responsibility for controlling risks rests with other Duty Holders, the OME IPT shall take all reasonable steps to assure themselves of the Duty Holders' competence for the relevant tasks. The OME IPT shall also provide other identified Duty Holders with sufficient information to perform the tasks safely, and in particular identify risks which the Duty Holders will be responsible for controlling.

7.3.1.3 During operational use of OME systems, the overriding consideration will generally be the management and taking of known risks by balancing the operational imperative against an understanding of the safety risks. As an example, weapons that exhibit a high degree of inaccuracy, early burst or failure to initiate at the target area will pose a potentially greater hazard to non-combatants and civilians than precision guided systems. Thus the safety implications of facets of requirements, driven by other systems engineering disciplines, will need to be understood by the operational Duty Holders. The OME IPT's main duty is to notify the hazard (source & path), whilst the level of probability assigned to such a hazard or its true consequence may only be known to the Site or Platform Duty Holder. In some cases the OME IPT may be justified in leaving the hazard Open until the partner Duty Holder is able to assess the scenario specific risks (pathway & receptor) and offer suitable mitigation.

7.3.1.4 The following provides an outline of responsibilities within the MOD OME SMS:

a. **Defence Ordnance Safety Board (DOSB):** oversight and direction of the formulation of OME safety policy and authorising its promulgation in accordance with the Board manual.

b. **Defence Ordnance Safety Group (DOSG):** is the Departments focal point for Ordnance/Munitions/Explosives (OME) Safety. DOSG has delegated responsibilities for:

- i. Provision of policy, advice and a range of permissioning functions, including full regulation, monitoring Departmental performance and thereby providing assurance on OME safety to the Secretary of State via the DOSB.
- ii. Developing, maintaining, reviewing and communicating OME safety, best-practice and standards and has a pool of scientific, engineering and operational Subject Matter Expertise to facilitate maintenance of that knowledge base.
- iii. Maintaining a pool of OME Safety Advisers within its competent OME support resource.
- iv. Managing a robust SMS to deliver these responsibilities and to actively encourage initiatives to harmonise and improve coherence between the different SMS operating within MOD.

c. **Munitions Corporate Business Unit (MCBU):** Developing, maintaining, reviewing and communicating a MLA policy including better approaches to munition lifing. Maintaining a corporate database for munition defects and accidents. Analysing trends, making appropriate duty holders aware, informing audit authorities and monitoring the follow up actions.

d. **Explosives Storage and Transportation Committee (ESTC):** Classifying military explosives: setting the standards within MOD concerning the safety of explosives in storage, transport and disposal. Ensuring MOD explosives standards, procedures and regulations meet the requirements of current legislation. Certify and register explosives packaging as defined in current legislation. Provide technical and explosives advice to Other Government Departments (OGD), MOD, NATO, the UN and other national and international organisations.

e. **Chief Inspector of Explosives MOD (CIE MOD):** Maintain and promulgate MOD regulations covering the safety of explosives during storage, transport and disposal. Licence MOD's explosives facilities in the UK and overseas in accordance with MOD and statutory standards. Conduct audits to provide assurances to the Secretary of State, Chiefs of Staff and relevant TLBs that MOD explosives storage facilities, movements of explosives and other relevant activities carried out by or at the direction of the MOD are managed in accordance with the MOD Explosives Regulations (JSP482) and any additional licence conditions.

- f. **Defence Land Ranges Safety Committee (DLRSC):** Developing, maintaining, reviewing and communication range safety policy and standards. Oversight of compliance with range safety standards and management principles.
- g. **OME Safety Advisers:** providing focused support and advice to IPTs and other customers on all aspects relating to the inherent safety of OME and the OME SMS. Any safety advice produced shall form an integral part of the OME safety case and hence part of the Implementation process.
- h. **OME Safety Review Panel (OSRP):** providing independent OME safety assurance through the review of safety submissions. In carrying out this function, the OSRP shall seek compelling and robust evidence, summarised suitable submission (e.g. a SCR) that the residual risks are in the tolerable region and that the ALARP arguments presented are comprehensive, credible and robust. The formal output of an OSRP review will be a CSOME. The level at which Review Panels will be chaired shall be proportional to the Risk Level Category of the OME System.
- i. **Senior Managers:** Senior Managers shall formally delegate tasks and responsibilities personally to nominated Duty Holders. These tasks shall be sub-delegated as appropriate to competent persons and their responsibilities embodied in Terms of Reference, contracts or through Standing Orders. Senior Managers are responsible for ensuring that OME safety management policy objectives are met throughout the acquisition cycle. This shall include ensuring that:
- i. The policy is widely available and understood and that a strong safety culture exists.
 - ii. Competent and empowered Material Duty Holders including Principal Duty Holders with their supporting authorities are identified for every Weapon system and equipment throughout the acquisition cycle.
 - iii. Appropriate safety management systems exist.
 - iv. Adequate resources are available to undertake the safety tasks delegated by them, so that safety requirements are achieved in reasonable time scales.
 - v. Adequate arrangements exist for the feedback of shortfalls in safety management systems, safety performance of designs, materiel and operational aspects through-life and their satisfactory resolution.
 - vi. Cascaded safety delegations and safety requirements are complied with.
 - vii. Safety performance is reported to the DOSB.

If there are ever any circumstances where a Material Duty Holder or delegated Assurance Authority has reservations about the effectiveness of the controls in place to manage a risk, Senior Managers should be called upon to determine whether a risk is broadly acceptable, or tolerable and as low as reasonably practicable. They shall take advice (technical, safety and legal) from the appropriate specialist area and direction from the DOSB if appropriate.

- j. **OME IPT Leader:** The OME IPTL is the Material Duty Holder responsible for;
- i. Setting up and maintaining an IPT Safety Committee with membership from all relevant stakeholders, including OME Safety Advisers.
 - ii. Developing and maintaining the OME safety case and performing all of the activities that it contains.
 - iii. Ensuring OME safety requirements are entered into the System Requirement Document.
 - iv. Enabling the safe integration of OME systems with all relevant Platform and Equipment IPTs.
 - v. Submitting OME Safety Submissions to the OSRP.
 - vi. Complying with the requirements to provide inherent OME safety information for trials with MOD involvement as defined in paragraph 3.5.3d.
 - vii. Ensuring that the risks associated with the OME system remain tolerable and ALARP throughout its service life.
 - viii. Setting and reviewing safety criteria/objectives through the IPT Safety Committee and in conjunction/cognisance of any higher System Safety Requirements.

- ix. Complying with relevant legislation and standards.
- x. Ensuring that individuals and authorities providing OME safety advice or with delegated safety responsibilities are competent to do so (i.e. that they are suitably professionally qualified and experienced carry out their duties in order to meet the statutory, MOD regulatory and technical requirements of their role.)
- k. **Depot and Logistic Duty Holders:** Prior to being issued to the user, OME equipment and systems may be stored, transported, assembled, dismantled, repaired and tested in service depots. Service Depot managers shall ensure that all activities are carried out in accordance with instructions issued by the OME IPT, and that the safety of OME equipment and systems is not compromised whilst in their custody. OME equipment and system users shall ensure that equipment is stored, transported (to and from deployment, e.g. returned to stores procedures) and operated within agreed boundaries, as prescribed by the IPT, and identified within the safety case.
- l. **Operational Duty Holders:** Prior to being issued to the user, OME equipment and systems may be used, repaired and tested in service depots. Front Line Commands and other duty holders shall ensure that all activities are carried out in accordance with the operational instructions issued by the OME IPT, and that the safety of OME equipment and systems is not compromised whilst in their custody. OME equipment and system users shall ensure that equipment is stored, transported and operated within agreed boundaries, as prescribed by the IPT, and identified within the safety case. This is applicable to OME systems used for trial and training as well as operational use.
- m. **Capability Customer:** Those formulating capability requirements shall address safety management at all stages of the acquisition cycle. The Capability Customer shall ensure that Duty Holders are aware of capability requirements and operational constraints when formulating their initial safety requirements. The Capability Customer retains responsibility for:
 - i. Providing the necessary funding to address safety during the acquisition cycle.
 - ii. Ensuring that platform integration or Weapon Equipment safety issues receive the prominence warranted by their significance during the creation of user requirements.
 - iii. Ensuring that a system or equipment's role or operating environment are not changed without adequate consideration and provision of revised safety requirements or changes necessary to ensure safe operation in the new role. This assurance shall be based on advice from the Material Duty Holder, OME Assurance Authorities and Operating Authorities.
- n. **The DOSG Safety Management Office:** The DOSG SMO is the Secretariat to the DOSB and is responsible to the Board for:
 - i. Establishing, maintaining and monitoring effective OME SMS policy.
 - ii. Sponsorship of the OME SMS, JSP520.
 - iii. The provision of advice and guidance on OME safety management policy matters to all Ministry of Defence civilian and military personnel and defence contractors.
 - iv. The procedures and mechanisms for administration of the DOSB, contained within the JSP520 and the DOSB Manual.
 - v. Provision of the secretariat for facilitating OSRPs.
 - vi. Maintenance of the OME standards portfolio via management of the JTRC.
 - vii. Audit users of the OME SMS against compliance with OME SMS documentation and the caveats and provisos detailed in CSOMEs.
 - viii. Preparation of an annual audit report covering the findings of audits performed for review by DOSB.

Close links shall be maintained with secretariat to the ESTC who are responsible for liaison with the Health and Safety Executive to ensure that OME safety management arrangements are consistent with civilian best practice.

8. DEFINITIONS, ABBREVIATIONS and REFERENCES

Definitions

Term	Definition	Source
Accident	An unintended event or sequence of events that causes harm	Def Stan 00-56/3, Ref 7
Accident Sequence	The progression of events that results in an accident.	Def Stan 00-56/3, Ref 7
Acquisition	Process of requirements setting, management of procurement, support and termination/disposal, implying a whole-life approach to defence capability. Typically conducted across the acquisition cycle	MOD Acquisition Handbook Ed5, Ref 28
Acquisition Management System	On-line 'one-stop shop' website for authoritative guidance, templates, best practice and user expertise for Defence Acquisition, www.ams.mod.uk	MOD Acquisition Handbook Ed5, Ref 28
Agree	To agree that a document fairly represents the current situation, within the scope of knowledge of the signatory.	
ALARP	A risk is considered to be 'As Low As Reasonably Practicable' when the cost of any further Risk Reduction is demonstrated grossly disproportionate to the benefit obtained from that risk reduction. This cost includes the loss of defence capability as well as financial or other resource costs,	Def Stan 00-56/3, Ref 7
Assumption	An assertion about the system, its operating environment or modes of use, that is employed without proof, although justification may be required.	Def Stan 00-56/3/Pt2, Ref 7
Assurance	Adequate confidence and evidence, through due process, that safety requirements have been met.	Def Stan 00-56/3, Ref 7
Authorise	To assert that a document may be issued and that it reflects the individual's acceptance of responsibility.	
Broadly Acceptable	A level of risk that is sufficiently low that it may be tolerated without the need to demonstrate that the risk is ALARP.	Def Stan 00-56/3, Ref 7
CADMID/T	The acquisition lifecycle comprising the Following phases: Concept, Assessment, Demonstration, Manufacture, In-Service and Disposal/ Termination.	Def Stan 00-56/3, Ref 7
Consequence	The outcome, or outcomes, resulting from an event.	Def Stan 00-56/3, Ref 7
Duty Holder	A MOD party with specific responsibilities for the safety management of the system.	Def Stan 00-56/3, Ref 7
Dynamic safety (OME)	A collective term applied to ordnance systems which discharge projectiles, including those events which occur in the period between launch initiation (intentional or otherwise) up to the end of flight, termination on target.	
Endorse	To assert that a document meets the requirements of relevant policy, procedures and good practice.	
Environment	Surroundings which a system or organisation effects, including air, water, land, natural resources, flora, fauna, and their interrelation with humans (third-parties)	Adapted ISO14001, Ref 31
Equipment	An item that is designed to provide one or more services or functions to the user, or the system of which it forms a part.	JSP454, Ref 3

Term	Definition	Source
Explosive	A substance (or a mixture of substances), which is capable by chemical reaction of producing gas at such a temperature and pressure as to cause damage to the surroundings. The term "explosive" thus includes pyrotechnic substances even when they do not evolve gases; all solid and liquid materials variously known as high explosives and propellants, together with igniter, primer, initiatory and pyrotechnic (e.g. illuminants, smoke, delay, decoy, flare and incendiary) compositions.	AOP-38, Ref 6
Explosive Remnants of War (ERW)	Munitions used during an armed conflict, live firing blinds and mis-fires that have failed to explode, or munitions which have been abandoned during an armed conflict.	
Harm	Death, physical injury or damage to the health of people, or damage to property or the environment	ISO Guide 51, Ref 27
Hazard	Potential source of harm	ISO Guide 51, Ref 27
Hazard Identification	The process of identifying and listing the hazards and accidents associated with a system.	Def Stan 00-56/3, Ref 7
Hazard Log	The continually updated record of the hazards, accident sequences and accidents associated with a system. It includes information documenting risk management for each hazard and accident.	Def Stan 00-56/3, Ref 7
Head of Establishment	The MOD Duty Holder with specific responsibilities for the safety management of a site, facility or range.	
Human Factors	The systematic application of relevant information about human capabilities, limitations, characteristics, behaviours and motivation to the design of systems.	Def Stan 00-56/3, Ref 7
Implementation	The enactment of those SMS activities which directly affect the safety of the OME equipment or system, through the specification, procurement, use ownership and management of a subject OME system.	
Incident	The occurrence of a hazard that might have progressed to an accident, but did not.	Def Stan 00-56/3, Ref 7
Independent Safety Auditor	An individual or team, from an independent organisation, that undertakes audits and other assessment activities to provide assurance that safety activities comply with planned arrangements, are implemented effectively and are suitable to achieve objectives; and whether related outputs are correct, valid and fit for purpose.	Def Stan 00-56/3, Ref 7
Inherent safety	The ability of an Ordnance System, Munition or Explosive device to retain its safety under specified stimuli (both intended and accidental), due to the nature of its design, its safety features and materiel employed as an inseparable part of that system.	JSP520, Issue 1.1 - intrinsic
Lines of development	Concepts and doctrine, personnel, Equipment & Technology, Infrastructures & Estates, Sustainability, Training	MOD Acquisition Handbook Ed5, Ref 28
Mitigation Strategy	A measure that, when implemented, reduces risk.	Def Stan 00-56/3, Ref 7
Munition	A complete device, (e.g. missile, shell, mine, demolition store etc.) charged with explosives, propellants, pyrotechnics, initiating compositions or nuclear, biological or chemical material, for use in connection with offence, or defence, or training, or non-operational purposes, including those parts of weapon systems containing explosives.	AOP-38, Ref 6

Term	Definition	Source
OME IPTL	The MOD Duty Holder with specific responsibilities for the safety management of an OME system. This party will normally be the OME Integrated Project Team Leader, or equivalent posting.	
Operating Environment	The total set of all external natural and induced conditions to which a system is exposed at any given moment.	Def Stan 00-56/3, Ref 7
Ordnance	<i>The sub-system of "a weapon system (with its associated munitions and auxiliary materiel) needed to fire munitions".</i>	AOP-38 with additional words in italics, Ref 6
Platform	A series of integrated component systems and equipment designed to carry out a function within an Operating Environment. For example a Ship, Aircraft, Vehicle, Communications network etc.	Adapted JSP454, Ref 3
Rigorous	Extremely thorough and accurate as well as strictly applied and followed.	Def Stan 00-56/3/Pt2, Ref 7
Risk	Combination of the probability of harm and the consequences of that event.	IEC 51 (adapted), Ref 27
Risk Analysis	Systematic use of available information to describe the hazards in an accident sequence associated with a system, and Estimate risk	IEC 51 (adapted), Ref 27
Risk Assessment	Systematic process of Risk Analysis and determination by relevant stakeholders that risks may be accepted or mitigation agreed after Risk Evaluation	
Risk Management	The systematic application of management policies, procedures and practices to the tasks of Hazard Identification, Hazard Analysis, Risk Estimation, Risk and ALARP Evaluation, Risk Reduction and Risk Acceptance.	Def Stan 00-56/3, Ref 7
Risk Reduction	The systematic process of reducing risk, by implementing mitigation strategies,	Def Stan 00-56/3, Ref 7
Safety	The expectation that a system does not, under defined conditions, lead to a state in which human life, property or the environment is endangered	Def Stan 00-56/3, Ref 7
Safety Argument	A logically stated and convincingly demonstrated reason why safety requirements are met.	Def Stan 00-56/3/Pt2, Ref 7
Safety Audit	Systematic and independent examinations to determine whether safety activities comply with planned arrangements. Where implemented effectively activities are suitable to achieve objectives; and whether related outputs are correct, valid and fit for purpose.	Def Stan 00-56/3, Ref 7
Safety Case	A <i>set of</i> structured arguments, supported by a body of evidence that provides a compelling, comprehensible and valid <i>evidence</i> that a system is safe for given applications in given operating environments.	Adapted Def Stan 00-56/3, Ref 7
Safety Case Report	A report that summarises the arguments and evidence of the safety case, and documents progress against the safety programme.	Def Stan 00-56/3, Ref 7
Safety Committee	A group of stakeholders that exercises, oversees, reviews and endorses safety management and safety engineering activities	Def Stan 00-56/3, Ref 7
Safety Management	The application of organisational and management principles in order to achieve safety with high confidence.	Def Stan 00-56/3, Ref 7
Safety Management Plan	A document that defines the strategy for addressing safety and documents the Safety Management System for a specific project.	Def Stan 00-56/3, Ref 7

Term	Definition	Source
Safety Management System	The organisational structure, processes, procedures and methodologies that enable the direction and control of the activities necessary to meet safety requirements and safety policy objectives.	Def Stan 00-56/3, Ref 7
Safety Programme	The part of a Safety Management Plan documenting safety time scales, milestones and other date-related information.	Def Stan 00-56/3, Ref 7
Safety Requirement	A requirement that, once met, contributes to the safety of the system or the evidence of the safety of the system.	Def Stan 00-56/3, Ref 7
Safety and Suitability for Service (S ³)	A general term used to summarise the requirements of munitions to be acceptably free from hazards, to have inherent characteristics that meet specified requirements during its agreed lifecycle. It does not include operational effectiveness	AOP-15, Ref 22
Senior Manager	A person within MOD with management responsibility for multiple Duty Holders or with accountability to the DOSB.	
Sub-System	A system that is an element of another system	Def Stan 00-56/3, Ref 7
System	A combination, with defined boundaries, of elements that are used together in a defined operating environment to perform a given task or achieve a specific purpose. The elements may include personnel, procedures, materials, tools, equipment, facilities, services and/or software as appropriate.	Def Stan 00-56/3, Ref 7
Tolerable	A risk is Tolerable when it is at a level that can be accepted.	Adapted Def Stan 00-56/3, Ref 7
Tolerability Criteria	Quantitative or qualitative measures for determining whether a risk is unacceptable, tolerable or broadly acceptable.	Def Stan 00-56/3, Ref 7
Unacceptable	A level of risk that is tolerated only under exceptional circumstances.	Def Stan 00-56/3, Ref 7
Validated Safety Argument	A safety argument, with supporting evidence, that has been subjected to sufficient scrutiny to provide assurance of the robustness of the argument and evidence.	Def Stan 00-56/3/Pt2, Ref 7
Validation	The process of evaluating a system, or element of a system, to determine whether it imposes requirements that are appropriate (and meet stakeholders' needs).	Def Stan 00-56/3/Pt2, Ref 7
Verification	The process of evaluating a system, or element of a system, at the end of an activity to determine whether it satisfies conditions imposed at the start of that activity.	Def Stan 00-56/3/Pt2, Ref 7
Weapon Platform	An aggregate of a weapon <i>system</i> , the associated launching vehicle or platform launching the munition, the available munitions and ancillary equipment necessary to test, aim, launch and guide the munition as applicable.	AAP-6
Weapon System	An aggregate of an ordnance system, including any associated munitions launching system, together with sufficient munitions and ancillary equipment necessary to test, aim, launch and guide those munitions as applicable.	Adapted AAP-6

Abbreviations

ACOP	Approved Code Of Practice
ALARP	As Low As Reasonably Practicable
AOP	Allied Ordnance Publication
ARM	Availability, Reliability and Maintainability
ASD	Aircraft Self Damage
AWBC	Aircraft Weapons Ballistic Committee
BR	Book of Reference
CESO	Chief Environment and Safety Officers
CIE MOD	Chief Inspector of Explosives Ministry of Defence
COMAH	Control Of Major Accident Hazards
CSOME	Certificate of Safety Ordnance, Munitions and Explosives
DACC	Dangerous Air Cargo Committee
DASB	Defence Aviation Safety Board
DE&S	Defence Equipment and Support
DESB	Defence Environment and Safety Board
DIB	Defence Infrastructure Board
DLRSC	Defence Land Ranges Safety Committee
DNSB	Defence Nuclear Safety Board
DOSB	Defence Ordnance Safety Board
DOSG	Defence Ordnance Safety Group
DOSG SMO	Defence Ordnance Safety Group Safety Management Office
DSTAN	Defence Standards Agency
E3	Environmental Electromagnetic Effects
EMC	Electro Magnetic Compatibility
EMF	Embarked Military Force
EOD	Explosive Ordnance Disposal
ERW	Explosive Remnants of War
ESTC	Explosives Storage and Transport Committee
FSB	Functional Safety Board
GARP	Generic Aircraft Release Procedure
GNE	Generic Naval Environment
HFI	Human Factors Integration
HLB	Higher Level Budget holder
HOE	Head Of Establishment
HSC	Health and Safety Commission
HSE	Health and Safety Executive
ILS	Integrated Logistic Support
IM	Insensitive Munitions
IMAP	Insensitive Munitions Assessment Panel
IMIS	Insensitive Munitions Implementation Strategy
IPT	Integrated Project Team
ISA	Independent Safety Auditor
ITEAP	Integrated Trials, Evaluation and Assessment Programme
JDCC	Joint Doctrine and Concepts Centre
JIMSG	Joint Insensitive Munitions Strategy Group
JSP	Joint Services Publication
JTRC	Joint Technical Requirements Committee
LSSB	Land Systems Safety Board
MACR	Major Accident Control Regulations
MCBU	Munitions Corporate Business Unit

MLA	Munitions Life Assessment
MOD	Ministry Of Defence
MSER	Manufacture and Storage of Explosives Regulations
MTDS	Manufacture to Target or Disposal Sequence
NA(EXP)	Naval Authority (Explosives)
NATO	North Atlantic Treaty Organisation
NEAS	Naval Environment Assessment Statement
OB	Ordnance Board
OGD	Other Government Departments
OME	Ordnance, Munitions and Explosives
IPTL	Independent Project Team Leader
OSE	Operational Safety Endorsement
OSRP	OME Safety Review Panel
OTS	Off The Shelf
POEMS	Project Oriented Environmental Management System
POSMS	Project Oriented Safety Management System
QA	Quality Assurance
RAF	Royal Air Force
S ³	Safe and Suitable for Service
SA	Safety Adviser
SCR	Safety Case Report
SEXSSI	Ship Explosive Store Safety Instruction
SI	Safety Instruction
SME	Subject Matter Expert
SMO	Safety Management Office
SMS	Safety Management System
SofS	Secretary of State
SQEP	Suitably Qualified and Experienced Person
SRD	Systems Requirement Document
SSB	Ship Safety Board
STANAG	Standardised NATO Agreement
TEACASE	Thermal Effects on Airborne Conventional Armament Stores and Equipment
THA	Threat Hazard Assessment
TLB	Top Level Budget holder
UN	United Nations
URD	User Requirements Document
USUR	Urgent Statement of User Requirement

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