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

Part 1 – Policy

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Authority

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The responsibility for use of correct and relevant standards, procedures and working practices remains with the Project Team Leader (PTL). No assurance is given that the list of referenced documents within JSP520 Part 1 is comprehensive or up to date. It will be necessary to check applicability for the intended use and where relevant confirm documents accuracy and suitability to the intended use.

Amendment Record

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Preface

It is the Defence Ordnance Environment and Safety Board's (DOESB) requirement that the highest standards of safety and environmental management shall be delivered. This is achieved through the development of its policies into a robust and comprehensive Safety and Environmental Management System for Ordnance, Munitions and Explosives (OME), articulated in a series of Joint Service Publications (JSPs) endorsed by the DOESB. There are clearly hazards and risks whenever explosives are commanded to function and 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 DOESB's policy for inherent OME safety and its environmental impact across the Acquisition Cycle within the OME Safety and Environmental Management 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 (ALARP). 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 OME safety and environment are consistent with his safety policy statement.

Maj Gen J S Mason
ACDS (Log Ops)
Chairman Defence Ordnance Environment and Safety Board

1 Introduction

1.1 Overview

1.1.1 The overarching Secretary of State (SofS) Policy Statement, laid down in Joint Service Publication (JSP) 815 (Safety, Health, Environmental Protection and Sustainable Development in the Ministry of Defence) (Ref.1), is promulgated by each Functional Safety Board (FSB) in the form of a domain specific JSP. For Ordnance, Munitions and Explosives (OME), the Defence Ordnance Environment and Safety Board (DOESB) sponsors a number of JSPs and associated publications that collectively form the OME Safety and Environmental Management requirements as detailed within this Policy document. The aim of this policy is to ensure that the levels of inherent risk presented by all OME acquired for use by, and at the direction of, the Ministry Of Defence (MOD) can be demonstrated to be Broadly Acceptable, or Tolerable and As Low As Reasonably Practicable (ALARP). 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) (refer to Section 5.3).

1.1.2 The MOD must fulfil its statutory obligations and its common-law duty of care whilst maintaining Defence capability. Project Team Leaders (PTLs) have been delegated the responsibility to establish a Safety and Environmental Management System (SEMS) and to generate Safety and Environmental Cases. These are published in domain-specific publications for Land (JSP454, Ref.2), Sea (JSP430, Ref.3) and Air (JSP553, Ref.4), and their interfaces are discussed in more detail within Section 2.4 of this document. However, due to the specialist nature and inherent hazards associated with OME, JSP520 provides additional requirements with specific procedures, assessments and technical requirements.

1.1.3 The MOD has adopted best-practice by implementing a goal-setting SEMS and the development of a body of evidence collated in a set of documents termed a Safety and Environmental Case, as detailed within the Acquisition Safety and Environmental Management System (ASEMS) (Ref.5). ASEMS is made up of the Project Oriented Safety Management System (POSMS) (Ref.6) and Project Oriented Environmental Management System (POEMS) (Ref.7). POSMS and POEMS contain manuals and processes to enable implementation of safety and environmental management systems that comply with corporate policy in a consistent manner. 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 and Environmental Case can draw upon modern and traditional safety and environmental management procedures, the application of good engineering practice and prescriptive standards where appropriate. Additionally the MOD is able to draw upon its considerable in-service experience with a wide range of OME systems. Outputs from a Safety and Environmental Case, together with clearances and certificates (as detailed in JSP520 Part 2, Leaflet C5: Clearances and Certificates) provide the degree of safety and environmental assurance required by the DOESB.

1.1.4 Compliance with the requirements of JSP520 will bring about through-life savings by consideration of hazards, reducing the frequency of incidents (including accidents and near miss) 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.

1.1.5 The requirements of this policy, which is sponsored by the DOESB, align and are compatible with the requirements for an MOD Safety and Environmental Case regime, as defined in JSP815.

1.1.6 Where there is an urgent need to update policy requirements and/or guidance within JSP520, the Defence Ordnance Safety Group Safety Management Office (DOSG-SMO) shall raise an SMO Notice. All Project Teams (PT) shall meet the requirements of all SMO Notices issued by DOSG-SMO. Further guidance on SMO Notices is presented in JSP520 Part 2 Leaflet: Introduction.

1.2 Document structure

1.2.1 JSP520 is split into two parts:

- a. Part 1 - Policy. This provides the policy framework, which applies throughout the whole acquisition cycle. It mandates a series of requirements, processes, inputs, outputs and independent reviews that 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 (Section 5.3). 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 the 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-specific safety JSPs and associated publications even if they remain the responsibility of the OME PTL.
- b. Part 2 – Policy Guidance Leaflets including Approved Codes of Practice. This expands on the Part 1 policy framework, describing in more detail the roles, responsibilities, procedures and techniques to be employed to implement the policy. Sections of the Part 2 leaflets have been marked as “Approved Codes Of Practice” (ACOPs). If these ACOPs are not used by the PT justification shall be documented in the OME’s Safety and Environmental Case Report and/or the Safety and Environmental Management Plan. Compliance with Part 2 and associated safety policies will meet the requirements of Part 1 and provide robust evidence that the levels of risk presented to personnel, third parties, materiel and the environment have been assessed and reduced so far as is reasonably practicable.

1.3 Terminology

1.3.1 The term ‘incident’ is used throughout this document to describe an incident, accident or near miss.

1.3.2 The term ‘safety’ is used throughout this document and refers to system safety and its impact on people and the environment. A distinction will be made where a variation to this approach is required.

1.3.3 To ensure consistent use of terms and phrases relating to safety within JSP520, a glossary of terms and their definitions, including a list of abbreviations, is presented within Section 8.

2 Scope

2.1 Definition of OME

2.1.1 The scope of JSP520 covers all equipment and systems that satisfy the agreed North Atlantic Treaty Organisation (NATO) definitions of OME, as stated within Allied Ordnance Publication (AOP) 38 (Ref.8). JSP520 shall be applied to assess the inherent OME safety of any equipment or system that satisfies the 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 Safety Management Policy, the definition of Explosives extends to novel materials designed to create an explosive effect.

2.2 Applicability

2.2.1 JSP520 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 5.3 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.

2.2.2 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 - including 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.

2.2.3 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 PT 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 PT 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.

2.2.4 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, where the OME PT shall justify those requirements that are not appropriate in their OME safety submission to the OME Safety Review Panel (OSRP) (See section 7.2).

2.3 Exclusions

2.3.1 The JSP is not intended to:

- a. Address Occupational Health and Safety and the implementation and management of 'Safe Systems of Work', that are necessary within the armed services that use OME equipment/systems, these are managed in accordance with JSP375 MOD Health and Safety Handbook (Ref.9) and Top Level Budget holder (TLB) procedures.
- b. Be used for contracting purposes. Contracting for safety is in accordance with Defence Standard 00-56, Safety Management Requirements for Defence Systems.

2.4 Interfaces

2.4.1 JSP520-compliant processes shall complement the overarching safety activities described in Section 5 conducted to establish the resultant risks presented by the equipment. Where there is no higher-level (system/platform) Safety and Environmental Case produced in accordance with one of the domain-specific safety JSPs, additional safety management activities (in addition to the inherent OME hazards) will be required in support of the overall safety claims.

2.4.2 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.

2.4.3 Whilst the OME PTL is responsible for all safety issues associated with the equipment, those hazards that fall outside the aforementioned definition of inherent OME safety (Section 2.1) shall be managed in accordance with the overarching domain-specific safety JSP applicable to the particular service operating environment(s). Hazards that might be further mitigated at a higher system or platform level shall be clearly identified and, where appropriate, addressed at that level.

2.4.4 Where ordnance systems comprise a number of equipments and sub-systems that are the responsibility of more than one OME PT, Senior Managers are authorised to appoint a single Duty Holder with overarching responsibility for co-ordinating and resolving pan-PT safety issues. Wherever a Safety and Environmental Case covers entire weapon systems, wider combat systems or platforms, the interfaces shall be assessed for requirements and risks that impact on the OME.

2.4.5 The interrelationships with JSP520 and JSP454/JSP430/JSP553/JSP482 are summarised below, with further detail provided in JSP520 Part 2, Leaflet A1: Process Interface.

- 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 part of progressive System Acceptance. The Land Systems PTL is ultimately responsible for the integration of the Safety and Environmental Cases of all equipment fitted to their vehicle/land-based system/weapon, including all OME fitted or carried as stores.
- b. JSP430 - defines the safety management requirements for ship platforms, systems and all equipment in the maritime operating environment, through-life. The inherent OME safety shall be assessed against JSP520 for all OME embarked on platforms governed by JSP430. The Maritime Platform PTL is ultimately responsible for the integration of the Safety and Environmental Cases of all equipment fitted to their vessels, including all OME. Combat System PTLs have similar responsibilities relating to the safety of equipment that comprise their systems. The outputs from the OME management 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 PTL is ultimately responsible for the integration of the Safety and Environmental 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. The outputs of JSP520 will support subsequent JSP553 process for Air Launched Weapon Release, Generic Aircraft Release Procedure (GARP), covering the Airworthiness of all MOD Aircraft.
- d. JSP482 - The JSP482 regulations (Ref.10) are produced for the guidance and instruction of all personnel, both Service personnel and MOD employed civilians (including supporting contracted staff), who are concerned with the management, storage, maintenance, inspection, processing, handling and disposal of explosives and explosives storage facilities within the MOD. It covers Explosives Legislation, Classification, Storage, Planning, Siting, Buildings, Traverses, Safety Standards, Licensing, Safeguarding, Control, Storage, Handling, Packaging, Marking, Sealing, Processing, Inspection, Bans and Constraints, Radio Frequency Hazards etc.

2.4.6 The MOD also shall demonstrate that it has an appropriate Management System in place to manage environmental impacts through-life. JSP418 Sustainable Development and Environment Manual (Ref.11) provides the MOD policy for environmental management, and the POEMS manual (Ref.7) adopted in Defence Equipment and Support (DE&S) provides good practice on procedures to be followed. These documents shall be referred to for guidance in these areas and are not replicated in this JSP.

2.4.7 OME System's Stakeholder interfaces shall be defined, agreed, recorded and controlled, as part of the Through Life Management of the OME. Guidance on defining and managing interfaces are provided in JSP520 Part 2, Leaflet A1: Process Interface.

3 POLICY

3.1 Legal Requirement

3.1.1 The MOD has legal and moral responsibilities to its employees and to other people who could be affected by its activities, with the SofS for Defence having overall responsibility for Health, Safety, Environmental Protection and Sustainable Development in the MOD. As such, the MOD shall comply with all applicable legislation and statutory provisions, covering safety as well as those that apply to environmental protection and sustainable development.

3.1.2 However, the policy statement states that where there are exemptions, or derogations from either domestic or international law, MOD shall introduce standards and management arrangements that are, as far as is reasonably practicable, at least as good as those required by legislation. The statement notes that the SofS will only disapply legislation on the grounds of national security, when such action is essential to maintain operational capability or in accordance with applicable laws.

3.1.3 The SofS Policy Statement is published in JSP815. In summary, the policy states that the MOD will:

- a. Within the United Kingdom, comply with all legislation that extends to the UK (including legislation giving effect to the UK's international obligations).
- b. Overseas, apply UK standards where reasonably practicable, and in addition comply with relevant host nations' standards.
- c. Set targets and ensure that safety, environmental protection and sustainable development performance is measured, monitored and reported and is consistent with and supports wider Government initiatives.

3.2 Legislation

3.2.1 All Regulations made under The Health and Safety at Work etc Act 1974 (HSWA) shall apply to the MOD, including the Armed Forces (unless stipulated otherwise). The MOD discharges its duty under this act through the SofS Policy Statement, as contained within JSP815.

3.2.2 The following sections of HSWA are of particular relevance to the instructions contained within this JSP:

- a. Section 2 - which imposes general duties on every employer to ensure, so far as is reasonably practicable, the health, safety and welfare at work of its employees, this duty extends to include the provision and maintenance of 'plant' (which includes any machinery, equipment or appliance) that is, so far as is reasonably practicable, safe and without risks to health. Note: the Health and Safety Executive (HSE) consider the two terms 'so far as is reasonably practicable (SFAIRP)' and 'as low as reasonably practicable (ALARP)' to mean essentially the same thing, and at their core is the concept of 'reasonably practicable.'
- b. Section 3 - which imposes a duty on every employer to conduct its undertaking in such a way as to ensure, so far as is reasonably practicable, that persons not in its employment who may be affected are not thereby exposed to risks to their health or safety.
- c. Section 5 – This has been replaced by The Environmental Protection Act (EPA) 1990 (Ref.12) - refer to paragraph 3.2.3.
- d. Section 6 - which imposes a duty on any person who designs, manufactures, imports or supplies any 'article for use at work' to ensure, so far as is reasonably practicable, that the article is designed and so constructed that it

will be safe and without risks to health when it is being set, used, cleaned or maintained by a person at work.

- e. Section 7 - which imposes a duty on every employee to take reasonable care for the safety of themselves and of other persons who may be affected by their acts or omissions at work. Also, as regards any duty imposed on their employer, they must cooperate with the employer to enable that duty to be performed or complied with.

3.2.3 The EPA is the centrepiece of current UK legislation on environmental protection. There are three environmental issues that place statutory duties on employers and are directly related to the health and safety function, these are: air pollution, water pollution and waste disposal. These statutory duties are contained in the EPA.

3.2.4 The Corporate Manslaughter and Corporate Homicide Act 2007 (Ref.13) introduced a new offence, that allows companies and other organisations where there had been a gross failing, throughout the organisation, in the management of health and safety with fatal consequences to be prosecuted. The Act itself does not give rise to personal liability. The MOD has a duty of care (in respect of this Act) when operating under normal conditions. Although the duty of care is to be maintained wherever practicable, the MOD has exemptions (in respect of this act) because of its unique role in the following areas:

- a. Operations, including peacekeeping operations and operations for dealing with terrorism, civil unrest or serious public disorder, where members of the armed forces come under attack or face the threat of attack or violent resistance.
- b. Activities carried out in preparation for, or directly in support of, such operations.
- c. Training of a hazardous nature, or training carried out in a hazardous way, which is considered to be necessary in order to improve or maintain the effectiveness of the armed forces with respect to such operations.
- d. Any duty of care owed by the MOD in respect of activities carried on by members of Special Forces. Special Forces are those units of the armed forces the maintenance of whose capabilities is the responsibility of the Director of Special Forces or are for the time being subject to the operational command of that Director.

3.2.5 The Defence exemption for training relates only to that of a hazardous nature. Basic and trade training for example is not covered. The MOD has a duty of care to ensure that its employees are trained to carry out the tasks required of them. Where those tasks are of a hazardous nature (operations etc) then the training will, of necessity, also be hazardous. To lessen that training would mean that the MOD would be failing in its duty of care. The MOD could then be accused of not providing its employees with sufficient means to carry out the task required, hence the exemption for those circumstances. That does not mean, however, that the risks of that training should not be assessed and that all reasonable care should not be taken.

3.2.6 It is the role of the PT and the supplier of the OME system to ensure that all relevant legislation is identified and managed accordingly. A compliance assessment against all applicable legislation shall be undertaken for the OME system. Further guidance on legislation compliance is provided within JSP520 Part 2, Leaflet C2: Legislation Compliance.

3.2.7 In cases where the compliance assessment has identified non-compliance(s) with legislation and exemption(s) or permissive exemption(s) is(are) available, and these non-compliance(s) is(are) considered to be essential for the maintenance of operational capability, an exemption case requesting approval to invoke the exemption(s) or derogations(s) shall be submitted to the delegated Authority. Further guidance on the

delegated Authority is available through Defence Ordnance Safety Group Safety Management Office (DOSG-SMO) and JSP375 (Ref.9).

3.2.8 It is accepted that it is impossible to mitigate all wartime hazards and Duty Holder judgements will have to be made in the scenarios examined (related to the military role and capability requirement) and the application of the ALARP principle. Specific criteria from safety requirements may be waived if, in the judgement of the appropriate MOD Safety Regulator, Operating Authority or Commanding Officer, the operational risks or associated penalties outweigh the safety benefits (the defence imperative).

3.3 MOD Relevance

3.3.1 MOD Application

3.3.1.1 Each Duty Holder shall comply with the following objectives:

- a. To manage the OME SEMS integrally with other safety and environmental management processes 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 the 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 inherent safety will be documented in the Safety and Environmental Case and its validity maintained.
- e. To identify interfaces with associated authorities and policies.
- f. To comply with the requirements of this Policy.
- g. To comply with DOESB objectives specified through SMO Notices, prior to the issue of formal updates to this policy.

3.3.1.2 The legal objectives of the OME SEMS are:

- a. To ensure, so far as is reasonably practicable that the OME is designed and constructed to be tolerably safe, and without risks to health.
- 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 grossly disproportionate expense would not be considered reasonable. It is important to remember that the judgement is a subjective one and the size or financial position of the employer is immaterial. Further detail is provided in JSP520 Part 2, Leaflet C3: Risk Management.
- c. To cross-reference safety and legal reviews for compliance with International Law, including Protocols additional to the Geneva Conventions.

3.3.1.3 The HSE provides guidance and objectives for tolerability criteria (refer to Leaflet C3: Risk Management) based on the risk of death of an individual and societal risk at the workplace or a specific site. DOESB may require the Duty Holder with responsibility for the site, as the Head of Establishment (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.

3.3.1.4 For OME systems the OME PTL is the Duty Holder responsible for the inherent safety of the OME 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.

3.3.1.5 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 any excursions back to the Principal Duty Holder. The OME PTL shall have responsibility for ensuring the munition remains safe in the normal operating environments and predicting the response of the munition in abnormal operating environments and advising appropriate Duty Holders including Heads of Establishments.

3.3.1.6 Whilst the MOD has no general exemptions from the HSWA and much of the associated regulation; it is exempt from the Explosives Acts of 1875 and 1923, but not successor Manufacture and Storage of Explosives Regulations (MSER) Regulations (Ref.14). Further explanation is provided in JSP482, Chapter 2 (Ref.10). The MOD has specific exemptions, disapplications or derogation from certain UK or EU legislation, international treaties or protocols. However, the SofS has directed the MOD 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 are to be used to optimise the balance between risks and the benefit to capability, the wider MOD, employees and third parties. Compliance with the requirements of JSP520 Part 1 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 assurance of higher hazards (Refs.15 & 16).
- c. Compliance with NATO AOP-15 (Ref.17).
- d. Compliance with the Management of Health & Safety at Work Regulations (Ref.18). The SEMS has adopted, wherever possible, the principles, definitions and terminology used in other MOD SEMS and Management of Health & Safety at Work Regulations.
- e. The SofS’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 the 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).

3.3.2 Safety Standards

3.3.2.1 To comply with SofS’s policy, the MOD requires evidence within the Safety and Environmental 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 order of preference is as follows:

- a. European standards¹.
- b. International standards.
- c. UK civil standards.
- d. Commercial standards widely recognised by industry.

¹ The selection of standards is discussed within the “Selection of Standards for use In Defence Acquisition” paper, dated 5th June 2008 and is available on the DStan website. This paper explains the order of preference in the selection of standards.
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- 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.

3.3.2.2 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 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 detail is provided in JSP520 Part 2, Leaflet C2: Legislation Compliance.

3.3.3 Insensitive Munitions

3.3.3.1 It is the MOD's policy to reduce equipment safety risks to levels that are Broadly Acceptable, or Tolerable and ALARP. Insensitive Munitions (IM) contribute to the ALARP principle 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 NATO Standardization Agreement (STANAG) 4439 (Ref.19), which the UK has ratified.

3.3.3.2 The MOD Policy Statement is:

- a. "The vulnerability of the munitions in the MOD inventory shall be reduced over time to meet the requirements of STANAG 4439.
- b. All new munitions requirements shall stipulate compliance with the IM criteria. Formal dispensation in the form of a 2* waiver from Director Precision Attack (Dir PA) and the appropriate DE&S Domain 2* Officer is required for any non-compliance, either in the requirement definition or in the procurement solution, in addition to justification within the Risk Assessment.
- c. All in-service munitions shall be kept under review to identify opportunities to achieve IM compliance and thereby reduce risk. Prior to replenishing stock (e.g. mid-life updates, repeat buys, etc), the procurement authority, normally the DE&S PT, shall investigate all options for improving IM compliance. Where improving the IM signature is technically achievable but for performance cost or time reasons, and the PTL proposes not to pursue improvements, formal dispensation in the form of a 2* waiver from Dir PA and the appropriate DE&S Domain 2* Officer is required."

3.3.3.3 Once the IM signature of the OME is available, the OME PT 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 Broadly Acceptable, or Tolerable and ALARP, nor of the possibility that highly sensitive munitions may not be widely deployable on every platform and could thus have restricted capability.

3.3.3.4 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, Leaflet C6: Insensitive Munitions.

3.4 Failure to comply

3.4.1 Notices and Censures

3.4.1.1 The HSE uses Crown Improvement Notices or Crown Prohibition Notices where they are considered necessary following an inspection of the MOD premises (including processes, practices and controls). Failure to comply with the requirements of a Crown Notice can lead to a Crown Censure. Crown censure is an administrative procedure, whereby HSE may summon a Crown employer to be censured for a breach of the HSWA Act or a subordinate regulation which, but for Crown Immunity, would have led to prosecution with a realistic prospect of conviction. JSP815 provides full details of the official agreements between the MOD and the HSE.

3.4.1.2 The Environmental Agency (EA) has a Memorandum of Understanding with the MOD to deal with issues of environmental protection. JSP418 Sustainable Development and Environment Manual provides full details of the EA enforcement and prosecution policy.

3.4.2 Civil Proceedings

3.4.2.1 Irrespective of whether the MOD is censured or an employee is prosecuted, civil claims may be brought against both. However, it is most unlikely that individual employees will be sued where the act/omission that allegedly gave rise to the damage in respect of which the claim is brought occurred whilst the employee was acting appropriately in the course of their employment.

3.4.3 Disciplinary Action

3.4.3.1 In any event the MOD employees could face disciplinary action if they have been reckless or negligent, or failed to carry out the duties imposed upon them by Law and/or the MOD.

4 Organisation and arrangements

4.1 Organisation

4.1.1 The SoFS for Defence has overall responsibility for Environment, Health and Safety throughout the MOD, has published a top-level SoFS Policy Statement, laid down in JSP815 (Safety, Health, Environmental Protection and Sustainable Development in the Ministry of Defence). JSP815 defines the structure and form of the Functional Safety Boards, whose responsibilities are delegated from the top-level Defence Environment and Safety Board (DESB). There are six functional safety boards:

- a. Defence Nuclear Environment Safety Board (DNESB).
- b. Land Systems Environment and Safety Board (LSESB).
- c. Ship Environment and Safety Board (SESB).
- d. Defence Ordnance Environment and Safety Board (DOESB).
- e. Occupational Health & Safety Board (OHSB).
- f. Defence Fuels and Gases Safety Board (DF&GESB).

4.1.2 In addition, the Military Aviation Authority (MAA) undertakes the role of the single regulatory authority responsible for all aspects of Air Safety across Defence, and sponsors JSP 553. The MAA Director General reports directly to 2nd PUS and although in attendance at the DESB is not accountable to it.

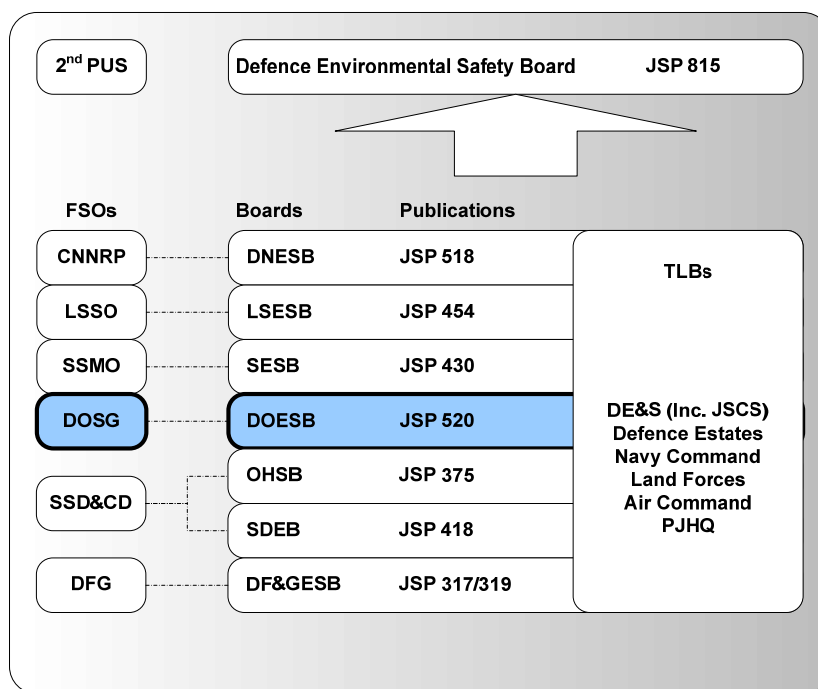


Figure 1: MOD Safety Board Structures & Associated Publications

4.1.3 As shown in Figure 1, the hierarchy within the OME domain from the DESB is through the DOESB, and subsequently the DOSG. In addition, there are a number of reporting committees to the DOESB. Each of these functions are now described in more detail.

- a. Defence Environment and Safety Board (DESB). The DESB is chaired by the Second Permanent Under Secretary (2nd PUS) and is part of the MOD corporate governance structure as set out in the SoFS Policy Statement and JSP815. It supports the 2nd PUS in carrying out responsibilities for safety within the MOD, and as the Department's champion for sustainable development, including the provision of assurance to the Permanent

Secretary that the management of these issues is effective and complies with the SofS Policy Statement. It provides direction, sets objectives, monitors, reviews and reports on performance. The Chairman of each Functional Safety Board receives a letter of delegation from the Chairman of the DESB, personally and in writing, detailing their responsibilities.

- b. Defence Ordnance Environment and Safety Board (DOESB). The DOESB is a Functional Safety Board that exists to provide top level direction on OME safety and environmental management in order to ensure the continual effectiveness of the MOD OME SEMS. The Board is chaired by a 2* officer who is personally appointed by 2nd PUS by Letter of Delegation.
- c. Defence Ordnance Safety Group (DOSG). DOSG is the MOD's focal point for OME Safety. DOSG provides policy, advice and regulatory functions on behalf of the SofS and monitors departmental performance to provide assurance on OME safety to the SofS through the DOESB. DOSG is pan MOD, with primary responsibility for matters relating to OME strategy, safety policy and its implementation, performance measurement and support.
- d. DOSG Safety Management Office (DOSG-SMO). The principle role of the SMO is to provide the technical secretariat for the DOESB by co-ordinating, monitoring and delivering OME safety and environmental policy and standards, regulation and assurance to achieve the Board's strategic objectives and key performance targets.

4.1.4 The following are the committees, working groups and Competent Authorities (CA) that report direct to DOESB:

- a. Explosives Storage and Transport Committee (ESTC). The ESTC is responsible for the classification of military explosives, as the UK Competent Authority. It is chaired by the Chief Inspector of Explosives (Ministry of Defence) (CIE (MOD)). It manages the on-going cycle of development, review and dissemination of inter-departmental policy, standards and regulation to ensure the safe storage, handling, processing and transport of military explosives. The ESTC Secretariat provide the technical administration for the ESTC, its sub-committees and Working Groups.
- b. Major Accident Control Regulations Competent Authority (MACR CA). The MACR CA oversees the implementation of the MACR (JSP498, Ref.20) throughout the MOD. JSP498 provides equivalent standards to those required by the Control of Major Accident Hazards Regulations 1999 (COMAH). UK legislation, which derives from a European Directive – Seveso II, does not apply to MOD. JSP498 requires establishments with holdings of hazardous substances over set threshold limits to produce documentation to demonstrate the establishment control measures for the prevention of Major Accidents and the mitigation of consequences to human health and the environment of any that do occur. The MACR CA is supported by the MACR Support Group (MACR SG).
- c. Joint Insensitive Munitions Strategy Group (JIMSG). The JIMSG facilitates implementation of the MOD's IM Policy on behalf of DOESB. JIMSG is a pan-MOD/Industry body whose mission is to develop the 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.
- d. Joint Technical Requirements Committee (JTRC). The JTRC provides a forum for mutual exchange of information between the MOD and Industry related to the production, review and amendment of Standards, including International Standards - principally those directly related to the design, testing and safety assessment of OME.
- e. Defence Land Ranges Safety Committee (DLRSC). DLRSC is the MOD focus for the safety of ranges, provide direction on the management and

maintenance of the safety of ranges and provide assurance of safety through monitoring of the range inspection and audit system. The DLRSC sponsors and oversees the production of JSP403 (Ref. 29) , forms and other documents that provide the necessary instructions and guidance for all concerned with the safety of MoD ranges and of other ranges at home and abroad used by MoD personnel.

- f. Military Laser Safety Committee (MLSC). The MLSC provides assurance on all aspects of military laser safety with the MOD. It provides direction and safety advice to PTs and end users regarding the design, management and safe operation of all laser systems being procured or in-service. The MLSC roles and responsibilities include management of JSP 390 Military Laser Safety (Ref.21), custodianship of STANAG 3606 (Ref.22), along with providing input into other defence standards and laser safety training for stakeholders and contractors. The Military Laser Safety Review Panel (MLSRP) issue certificates on behalf of the MLSC.
- g. JSP 520 Editorial Committee. The JSP520 Editorial Committee is a forum established by the DOESB 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 DOESB 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 DOESB including DOSG.
- h. OSRP Management Board (OSRPMB). The OSRPMB provide high level guidance and resolution of process review issues and consistency of OSRP decisions, Subject Matter Expert (SME) support and SMO management issues. The OSRPMB ensure that the OSRP focuses on the assurance objectives, scope and programme of work. The OSRPMB exists as a Management Board under the authority of Head of DOSG. The Head of DOSG, takes direction from DOESB. The Chair of the OSRPMB is personally appointed by the Head of DOSG. The function of the OSRP will be managed in accordance with the OSRP Manual (Ref.23).

4.2 Roles and Responsibilities

4.2.1 The SofS Policy Statement declares that safety is both a line management and individual responsibility. A series of delegations are in place to ensure that responsibility and accountability for safety are clearly defined. In the MOD these are issued in the form of a formal 'Letter of Delegation'.

4.2.2 Where this policy applies, all personnel have a responsibility to ensure that:

- a. Safety and environmental policies are understood and complied with.
- b. They exercise a duty of care to themselves and other persons affected by their acts or omissions.
- c. They understand their organisation's safety management arrangements and the interfaces with other safety management arrangements.

4.2.3 The key Roles and Responsibilities within the OME domain can be found in JSP520 Part 2, Leaflet B2: Roles and Responsibilities.

4.3 Competence

4.3.1 Health and Safety legislation requires certain duties to be carried out by Suitably Qualified and Experienced Person (SQEP). In the Management of Health and Safety at Work Regulations (Ref.18) a competent person is defined 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”.

4.3.2 Personnel 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, experienced, and possess current knowledge 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 develop and maintain competence levels, and to supervise/oversee where individuals require further development.

4.3.3 Safety competencies shall include an understanding of risk-based safety management methods needed to tailor them to meet specific OME or weapon equipment requirements.

4.3.4 All individuals with significant OME safety management responsibilities and/or those claiming to be suitably qualified and experienced (e.g. safety managers/ focal points, OME Safety Advisors, Independent Safety Auditor (ISAs), SMEs and contracted staff), shall be assessed against the appropriate National Occupational Standards (NOS) for Explosives Substances and Articles (ESA).

4.3.5 Guidance on Competence is provided in JSP520 Part 2, Leaflet B3: Competence.

4.4 Safety Culture

4.4.1 A ‘Safety Culture’ is defined by the Health and Safety Commission (HSC) as “the product of the individual and group values, attitudes, competencies and patterns of behaviour that determine the commitment to, and the style and proficiency of, an organisation’s health and safety programmes”. Organisations with a positive safety culture are characterised by communications founded on mutual trust, by shared perceptions of the importance of safety, and by confidence in the efficacy of preventative measures.

4.4.2 There are a number of issues that all personnel should strive to achieve within the organisation. Here are three key measurable considerations in establishing this safety culture that shall be adhered to:

- a. A ‘Just’ Culture. Safety Culture requires an atmosphere in which individuals are not unduly punished or blamed for their mistakes. Although the MOD strives to achieve this, the organisation is also subject to rules and legal regulation. As such a ‘Just’ culture shall be implemented to encourage a free flow of safety information across the organisation. The ‘Just’ culture is one in which individuals are not free of blame if they are culpably negligent, and where the MOD gives due regard to honesty. Errors and mistakes are inevitable, and safety management can only be improved if the organisation can learn from its mistakes.
- b. Incident Reporting and Investigation. A key part of Safety Management is measuring performance to know how safe the MOD operations are, and to identify problem areas for improvement. Information on real incidents, whether or not they actually caused damage, shall be used to learn about actual problems and to improve the management of safety.
- c. Continuous Improvement. The safety achievement of a system is not static and will usually tend to degrade over time as people become complacent and less vigilant. Monitoring and feedback shall be used to maintain and improve the safety performance. Continuous Improvement can be achieved in several ways through Auditing and Performance Review activities. Safety management should not be viewed as a one-off exercise and personnel shall continuously strive to improve safety performance.

5 Planning and Implementation

5.1 Overview

5.1.1 Planning and Implementation activities are those with a direct affect on the safety of the OME equipment or system, involving the specification, procurement, use, ownership, management and disposal of the subject OME. As a general principle, authorities responsible for Planning and Implementation cannot subsequently provide assurance of that activity. The authority primarily responsible for satisfying OME Safety Planning and Implementation requirements is the OME PTL.

5.1.2 The primary Planning and Implementation activities conducted by the OME PT shall include:

- a. Establishing Requirements (section 5.4).
- b. Generation of the Safety and Environmental Management System (section 5.5).
- c. Allocation of OME Risk Level Category (section 5.6).
- d. Munitions Life Assessment (section 5.7).
- e. Conducting Trials (section 5.8).
- f. Safety and Environmental Case Development (section 5.9).
- g. Risk Management (section 5.10).
- h. OME Safety Submission (section 5.11).
- i. Appointment of an OME Safety Advisor (section 5.12).
- j. Management of Safety Information (section 5.13).

5.2 Application of JSP520 through the MOD Acquisition Cycle

5.2.1 Safety management activities shall be initiated at the earliest possible stage in the MOD acquisition cycle. Where procurement follows the traditional MOD acquisition cycle, requirements shall be identified for each successive stage, including the specific Implementation and Assurance activities mandated by JSP520.

5.2.2 At the early stages of a project the OME PT shall produce an OME SEMS, 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 and Environmental Case evidence shall be used as the basis of successive reviews conducted by both the PT and the OSRP at key project milestones throughout the acquisition cycle. The processes defined by the OME PT shall follow the principles within JSP520 Part 2, Leaflet B1: Safety and Environmental Management System and shall incorporate sufficient flexibility to cope with projects following both a conventional acquisition cycle and alternate acquisition models such as Off-The-Shelf procurement, Urgent Operational Requirement (UOR), etc.

5.3 OME Safety through the MTDS

5.3.1 All OME shall be assessed against their MTDS. The MOD safety responsibilities extend across the entire MTDS, necessitating PTs 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.

5.3.2 The OME PTL 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. Guidance on OME safety through the MTDS can be found in JSP520 Part 2, Leaflet C4: Safety and Environmental Case Development.

5.4 Establishing Requirements

5.4.1 Each Duty Holder shall identify and record safety requirements, in consultation with their Capability Sponsor (CS). 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.

5.4.2 Initial safety requirements shall be developed according to sound design practice or standards such as Defence Standard (Def Stan) 07-85 (Ref.24), with particular emphasis on specifying those safety requirements arising from safety legislation, regulations, standards and the MOD policy. Where production of the Safety and Environmental Case is contracted out, recognition of contractual requirements shall also be given, in accordance with Def Stan 00-56 (Ref.25) and JSP418 (Ref.11).

5.4.3 For areas of design that 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 and Environmental Case.

5.4.4 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) (Ref.17).

5.4.5 The safety requirements set for 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 validation² of both software and hardware, and energetic components, proportionate to the risks.

5.4.6 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.

5.4.7 Further guidance on establishing and managing requirements is detailed within the "Requirements and Acceptance" part of the Acquisition Operating Framework (AOF) (Ref. 26).

5.5 Generation of the Safety and Environmental Management System

5.5.1 The PT's OME SEMS shall be established at the initiation of a Project, and shall be managed, maintained, reviewed and updated through-life.

5.5.2 The PT shall establish a Safety and Environmental Panel (SEP) to manage its SEMS through-life. Where a PT has a number of OME systems under its Duty of Care then a Safety Environmental Management Committee (SEMC) may be established.

5.5.3 All PTs shall satisfy the requirements of the domain-specific safety JSP (e.g. JSP430, JSP454, or JSP553) relevant to the operating environments for that OME by working within a robust integrated SEMS. For JSP520-applied systems, the SEMS shall also provide a description of the PT's system for managing inherent OME safety and complying with the

² Further guidance is provided within the Acquisition Operating Framework (AOF)
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requirements of JSP520. This may be in the form of a stand-alone PT OME SEMS or as an Annex to the main document.

5.5.4 The content of the PT OME SEMS assumes the existence of an overarching PT SEMS that has been produced to the requirements of an alternative functional safety policy. Where no such document exists, the OME PT shall develop a comprehensive SEMS to meet the requirements of one, or more, of the domain safety policies.

5.5.5 Further guidance on SEMS, SEMP, SEP and SEMC are detailed in JSP520 Part 2, Leaflet B1: Safety and Environmental Management System.

5.6 Allocation of OME Risk Level Category

5.6.1 The level of effort and resources applied to the management of OME safety should be proportional to the complexity of the system and level of risk involved. This shall be determined by the OME PT identifying and assigning an OME Risk Level Category to all OME.

5.6.2 The OME Risk Level Category shall be initially assigned at the earliest possible stage in the acquisition cycle and prior to OSRP assessment, but may change as the project develops and further information becomes available.

5.6.3 The OME Risk Level Category shall also determine the level of review to be undertaken by the OSRP. Systems reviews will be proportional to the risk; therefore Low Risk systems will have a lower level of review than that undertaken for High/Medium Risk systems.

5.6.4 Detailed guidance on assigning OME Risk Levels is provided in JSP520 Part 2, Leaflet C1: OME Risk Level Category.

5.7 Munitions Life Assessment

5.7.1 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, by applying the precautionary principle³, 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.

5.7.2 JSP762 (Ref.27) requires that appropriate techniques for gathering data on the operating environment and safety through-life are justified in the Safety and Environmental 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 MOD acquisition cycle and the MLA principles for Initial Service Life Trials, Service Life Amelioration Methods and In-Service Surveillance (ISS) implemented. The SEMS shall also take due cognisance of the management structures for implementing the MOD MLA policy across the MOD.

5.8 Conducting Trials

5.8.1 Conducting trials are necessary to generate evidence to support the Safety and Environmental Case arguments.

³ Further guidance is provided within the Acquisition Operating Framework (AOF).
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5.8.2 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 PTL (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. Such trials shall require a Certificate of Safety Ordnance, Munitions and Explosives (CSOME) via an OME Safety Submission to the OSRP.

5.8.3 The risk assessments for trials shall be proportional to the risk, taking cognisance of the known operating envelope, the likely controls and safeguards that will be in place and the likely time at risk. 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 Integrated Trials, Evaluation and Assessment Programme (ITEAP).

5.8.4 When conducting trials, the OME PTL (or nominated Duty Holder, including the sponsor) shall, if applicable, apply the requirements of JSP 536 (Ref.28) where trials involving human participants require adequate safety and ethical scrutiny.

5.8.5 Specific requirements relating to land ranges are published in JSP403 (Ref.29). Trials involving air-carried munitions shall satisfy the requirements of JSP553 (Ref.4) and JSP800, Volume 4A (Ref.30). OME systems shall satisfy the requirements of JSP430 (Ref.3) where they are embarked on platforms governed by JSP430. A pre-requisite will be the issue of a CSOME based on OSRP review of the OME safety submission.

5.9 Safety and Environmental Case Development

5.9.1 Def Stan 00-56 (Ref.25) defines a Safety Case as "A structured argument, supported by a body of evidence that provides a compelling, comprehensible and valid case that a system is safe for a given application in a given operating environment." POEMS (Ref.7) defines a Environmental Case as "*A body of evidence that is compiled and maintained throughout the lifetime of a project on its environmental aspects and impacts.*" In recent years Safety Cases and Environment Cases have been combined together, into a Safety and Environmental Case.

5.9.2 The MOD policy stipulates that a robust body of safety and environmental evidence termed a Safety and Environmental Case shall support all equipment operated by or at the direction of the MOD. The detailed content of the MOD Safety and Environmental Cases is dependent on the domain in which the equipment will operate and defined in the relevant domain-specific safety JSP, Land (JSP454, Ref.2), Sea (JSP430, Ref.3) and Air (JSP553, Ref.4). Whilst these policy documents are optimised for their particular domain, they share a common structure and approach.

5.9.3 The safety requirements of the OME, Ship, Land and Aviation Functional Safety Boards are similar in that each stipulates the need for a single comprehensive, credible and robust Safety and Environmental 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 and Environmental Cases, and each authority is required to manage the interface between their own responsibilities and those of other related systems through a proportionate, risk-based approach to safety management.

5.9.4 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. The assessment of safety relies upon a system-based hierarchical approach (refer to JSP520 Part 2, Leaflet A1: Process

Interface), with safety established at successively higher levels from component to equipment, subsystem and system. For example, for equipment that satisfies the AOP-38 definition of Ordnance, the safety assessment will 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.

5.9.5 The OME PT shall prepare a Safety and Environmental Case for their system or equipment that complements the higher-level systems or platform Safety and Environmental Cases. The aim is to have a seamless flow of safety information between Safety and Environmental Cases at successive levels, be it equipment, system or platform.

5.9.6 The Safety and Environmental Case shall define the system, its boundaries and its operating environment, with all interfaces clearly identified and effectively managed (refer to JSP520 Part 2, Leaflet A1: Process Interface). In order to achieve that, interfaces shall be clearly established and the requirements of the different safety policy documents understood.

5.9.7 OME Safety and Environmental Case Reports (SECRs) shall be produced periodically and at Key Project milestones (refer to section 5.11) in the MOD acquisition cycle from Initial Gate onwards. Periodicity of producing regular SECRs arising from Safety and Environmental Case reviews, for the in-service phase (as distinct from introduction to service), should be proportional to the risks associated with the system and should align with the business approvals process. The periodicity of producing SECRs shall be recorded in within the SEMP. SECRs provide a status report on the OME safety and environmental activities undertaken to that point and are the functional output from the body of evidence contained in the Safety and Environmental Case. It shall demonstrate OME system performance against the OME Safety and Environmental requirements specified for that system and those specified by this policy.

5.9.8 As the Project matures, subsequent SECRs shall summarise the results of the formal safety and environmental assessment activities conducted by the PT. It shall provide compelling evidence that the OME system complies with relevant legislation and that appropriate OME safety risks are Broadly Acceptable, or Tolerable and ALARP, throughout the MTDS when operated within agreed boundaries.

5.9.9 The SEMS shall articulate those posts have the authority to sign off residual risks, whether it's the Platform PT and/or the weapon commodity PT, as appropriate. Such approval shall indicate their satisfaction with the progress of the Safety and Environmental Case and their acceptance of the risks and environmental impacts associated with the project. Further guidance is presented in JSP520 Part 2, Leaflet C3: Risk Management.

5.9.10 Existing OME Safety and Environmental Cases shall be reviewed when changes occur to the modification state; operating environment; or the role of the subject equipment, and the existing arguments justifying the safety claims reassessed. Additional factors to consider when reviewing the periodicity are presented in JSP520 Part 2, Leaflet B1: Safety and Environmental Management Systems.

5.9.11 A generic template providing guidance for constructing the OME SECR is available within JSP520 Part 2 Leaflet C4: Safety and Environmental Case Development and provides the level of evidence that shall be contained within an SECR at various stages throughout the Acquisition Cycle, to satisfy the OME Submission to the OSRP.

5.9.12 The OME SECR shall include references to relevant clearances and certificates, as applicable, which support introduction into service as detailed in JSP520 Part 2, Leaflet C4: Safety and Environmental Case Development, including:

- a. ESTC Hazard Classification.
- b. Explosive qualification.
- c. Range safety assessments.
- 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.

5.9.13 Where an OME Safety Advisor and/or ISA is appointed by the PT, all relevant conclusions drawn from advice and/or audit reports shall be included in the OME SECR to provide support to safety arguments and declarations.

5.10 Risk Management

5.10.1 The three domains in which the MOD equipment is used pose a wide range of threats, and consequently the policy published for each functional safety domain describe domain specific requirements. Underlying these, in common with this JSP, is a risk-based approach based on the Safety and Environmental Case encompassing:

- a. Safety and Environmental Management System.
- b. Safety and Environmental Management Plan.
- c. Safety and Environmental Requirements.
- d. Safety and Environmental Case Reports.

5.10.2 Duty Holders shall adopt a risk-based safety management approach to system design and through-life management. They shall demonstrate in their Safety and Environmental Case and SEMS details of their system, its manner of operation, and the operating environments to which it will be subjected. They shall begin implementation of processes that 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 assess levels of risk presented by the OME and consider reduction of those risks using suitable methods to control consequence and/or probability, and seeking appropriate advice from OME Safety Advisors and Subject Matter Experts. They shall consider the balance between operational benefits and options for mitigation, by avoiding the imposition of inappropriate controls and justify their decisions accordingly.

5.10.3 All Duty Holders are permitted to assess the use of novel approaches which previous practice may not have allowed. The justification for the use of novel approaches shall be documented in the OME's Safety and Environmental Case Report and/or the Safety and Environmental Management Plan. 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 Broadly Acceptable, or Tolerable and ALARP.

5.10.4 The MOD's preferred standard for contracting for safety management is Def Stan 00-56 (Ref.25), 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 standards for PTs meeting the requirements of this policy are the POSMS (Ref.6) and the POEMS (Ref.7).

5.10.5 Irrespective of the standard selected each Duty Holder shall adopt a risk-based approach, with suitable emphasis placed by the PT on the level of scrutiny that is appropriate and in proportion to the level of risk presented by the 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.

5.10.6 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 Broadly Acceptable, or Tolerable and ALARP.

5.10.7 The evidence generated by the safety management process shall be the backbone of the Safety and Environmental Case, and, wherever practicable, the Duty Holder should select common processes regardless of the domain in which the equipment will operate.

5.10.8 The authority necessary to accept a risk depends on the risk level. The SEMS should articulate which roles have the authority to sign off Class A to Class D risks, whether it is the Platform PT or the Weapon Commodity PT, as appropriate.

5.10.9 Further guidance on Risk Management is presented within JSP520 Part 2, Leaflet C3: Risk Management.

5.11 OME Safety Submission

5.11.1 DOESB requires that all OME systems are assured for compliance against this policy. Assurance of inherent OME safety shall be through the independent review of documentary evidence undertaken by an OSRP. These documents collectively form the OME Safety Submission. By presenting an OME Safety Submission to the OSRP, the OME PTL is requesting independent validation that the safety and environmental management processes being implemented by the PT demonstrably satisfy the requirements of JSP520.

5.11.2 The OME PTL shall present OME safety submissions for OSRP review at key project milestones throughout the MOD acquisition cycle. As a minimum, these shall include:

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

5.11.3 In addition to these main milestones, the OSRP Secretariat shall be notified at any stage of the MOD acquisition cycle where changes affect assumptions about the inherent safety of the system. The OSRP will advise the OME PT of any action required, which may range from a formal letter notifying the OSRP of the changes to a full OME safety resubmission of the safety and environmental 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, including trial programmes and logistic or through-life issues.
- c. Changes to legislation or OME policy.
- d. Change of manufacturer or manufacturing process.
- e. Changes to the service depot processing arrangements.

- f. Significant incidents which bring assumptions within the Safety and Environmental Case into question.

5.11.4 The content and format of the OME Safety Submission will be dependent on a number of factors, for example:

- a. Stage of MOD acquisition cycle/acquisition strategy.
- b. Type of OME system (Ordnance, Munition or Explosive).
- c. OME Risk Level Category.
- d. Tailored evidence (e.g. Urgent Operational Requirements, Safety of Life at Sea (SOLAS), etc). Refer to JSP520 Part 2, Leaflet C4: Safety and Environmental Case Development, section 4.

5.11.5 The content of an OME Safety Submission shall be in accordance with JSP520 Part 2, Leaflet E1: OME Safety Review Panel Process.

5.11.6 Where OME is brought into service under UOR arrangements and then retained in service once the UOR has lapsed, then the full requirements of JSP520 shall be completed, within a reasonable timescales as agreed by the OSRP. This assessment shall include the submission of a full SECR and associated documents, that form an OME Safety Submission, to an OSRP for independent review and endorsement in accordance with JSP520 Part 1. Irrespective of this, the PT should be continuing to gather evidence to demonstrate the full requirements of JSP520, whilst the OME system is still classified as an UOR.

5.11.7 OME Safety Submissions shall be presented under a covering letter, signed by the OME PTL, or by an authorised representative, to acknowledge ownership. The content of the covering letter shall be in accordance with JSP520 Part 2, Leaflet E1: OME Safety Review Panel Process.

5.11.8 The OME SECR shall provide sufficient detail to satisfy the OSRP that relevant legislation and standards are complied with, that residual risks are Broadly Acceptable or Tolerable and that any ALARP statements are comprehensive, credible, robust and proportionate.

5.11.9 Where an OME Safety Advisor and/or ISA is appointed by the PT, all relevant conclusions drawn from advice and/or audit reports shall be included in the OME SECR to provide support to safety arguments and declarations.

5.11.10 The OSRP will issue a CSOME, if it is satisfied that the OME safety submission fulfils the requirements of JSP520. If the OSRP is not satisfied with the OME safety submission, the OME PTL will be formally informed of the panel's decision and reasons for rejection in writing (see Section 7.2 for further details on the OSRP).

5.11.11 Documentation submitted (one hard copy and one electronic copy) to the OSRP may be in any format suitable for review. Failure to provide adequate evidence will result in submissions being returned or timescales delayed while the relevant information is provided.

5.11.12 DOSG-SMO shall maintain an OSRP database, and report any significant shortfalls to the DOESB. The PTL shall inform the OSRP Secretariat of any changes to the PTL, PT's point of contact; and ownership of the OME system.

5.11.13 Further detail on the OSRP Process is presented within section 7.2 and JSP520 Part 2, Leaflet E1: OME Safety Review Panel Process.

5.12 Appointment of an OME Safety Advisor

5.12.1 Unless the OME PTL can demonstrate that sufficient OME safety competence exists within their PT 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 available from the DOSG Weapon Systems (WS) team. Guidance on the Role and Responsibilities of an OME Safety Advisor is detailed in JSP520 Part 2, Leaflet B2: Roles and Responsibilities. Guidance on competence is detailed within JSP520 Part 2, Leaflet B3: Competence.

5.13 Management of Safety Information

5.13.1 As the Safety and Environmental Case includes a 'body of evidence', identifying, obtaining and managing the evidence is of the utmost importance. The OME PT shall put arrangements in place to manage the identification, obtaining, updating, configuration control and review of safety related documents and information; ensuring that urgent safety related information is made visible to all relevant Duty Holders/Users without delay.

5.13.2 MOD policy for retaining safety and environmental related information is to comply fully with the requirements of civil statute. Specific legal requirements for keeping records are defined in JSP815 (Ref.1), with further guidance in POSMS SMP 12 (Ref. 6). Attention is drawn to the requirement that where there is no statute stipulating information retention times for specific hazards, the MOD Legal Adviser advises that safety related documentation (e.g. Safety and Environmental Cases and safety certification) shall be kept for ten years after equipment disposal. When equipment is sold, all such pertinent documentation shall be handed to the new Delegated Authority.

5.13.3 Further guidance on the management of safety related information is detailed within JSP520 Part 2, Leaflet B1: Safety and Environmental Management System. Guidance on configuration management is detailed within and JSP520 Part 2, Leaflet C4: Safety and Environmental Case Development.

5.14 Transferring the Safety and Environmental Case

5.14.1 Where an OME system is to be transferred to another management authority, it shall be the joint responsibility of the existing acquisition and operating authorities to ensure that the Safety and Environmental Case is complete and up to date. The handover and acceptance criteria shall be systematic and documented.

5.14.2 A review and update of the through life SEMS shall be undertaken and any incomplete or outstanding risk management activities identified. The resources required to implement any incomplete or outstanding actions shall also be identified and agreed with the receiving management authority.

6 Measuring Performance

6.1 Introduction

6.1.1 Measuring performance is essential to maintain and improve safety performance. Information on performance shall be gathered by each OME PT in two ways: Active systems and Reactive systems, described in sections 6.2 and 6.3 respectively.

6.1.2 OME PTs need to measure what they are doing to implement their SEMS, to assess how efficiently they are controlling risks, and how well they are developing a positive safety culture. OME PTL shall be responsible for planning and monitoring safety performance against SEMS and applicable safety and environmental legislation, policy and standards.

6.2 Safety and Environmental Management System Monitoring

6.2.1 Active monitoring in the form of audit and review activities shall be used to verify that a SEMS is complying with planned arrangements, and whether these arrangements are implemented effectively and are suitable to achieve its aims and objectives.

6.2.2 Guidance on Audit is provided in JSP520 Part 2, Leaflet E2: Audit and guidance on the review activities of the PT's safety committee is detailed in JSP520 Part 2, Leaflet B1: Safety and Environmental Management System.

6.3 Incident Monitoring

6.3.1 Timely and accurate reporting of incidents is an essential element of any SEMS. Where this JSP520 policy applies all personnel are responsible for the reporting of OME related incidents to the relevant PT, Advising Authorities, Service Administrative Authorities and Munitions Incident Database Cell (MID Cell) at the earliest opportunity, even when considered trivial or attributable to the equipment in the form of defects or failures.

6.3.2 There are a number of mechanisms within the MOD to report and record incident information that are principally in accordance with JSP482 (Ref.10). Monitoring of incident reports shall be a continuous process, with the arrangements recorded within the SEMS. Review and subsequent decisions about action required shall be monitored through the PT's SEP/SEMC.

6.3.3 Regular reviews of fault, defect and deficiency reports shall also be carried out and reported to the PT's SEP/SEMC, to ensure that defects or possible trends in equipment failures do not compromise safety performance. The MID Cell is tasked by the DOESB to collate all incidents involving OME and to report incident trends and statistics accordingly.

6.3.4 Any incident reports, investigations into defects, or results from other activities which may alter any assumptions within a Safety and Environmental case shall be brought to the attention of relevant Duty Holders and assurance bodies with which those findings may affect.

6.3.5 Guidance on Incident Monitoring is provided in JSP520 Part 2, Leaflet D1: Safety Performance Reporting and Feedback.

7 Auditing and Performance Review

7.1 Introduction

7.1.1 Auditing and performance review are the final steps in the safety management control cycle. They constitute the feedback that enables an organisation to reinforce, maintain and develop its ability to reduce risks to Broadly Acceptable, or Tolerable and ALARP, and to ensure the continued effectiveness of the SEMS. Auditing and reviewing performance can be defined as:

- a. **Auditing performance** is the structured process of collecting independent information on the efficiency, effectiveness and reliability of the total SEMS and drawing up plans for corrective action.
- b. **Reviewing performance** is the process of making judgements about the adequacy of performance and taking decisions about the nature and timing of the actions necessary to remedy deficiencies.

7.1.2 The management of OME Safety and Environmental Assurance activities, encompassing auditing and performance review, comprises three major elements:

- a. Independent review of the inherent explosive elements of OME safety submissions by the OSRP (section 7.2).
- b. Audit against the requirements of JSP520 (section 7.3).
- c. End-to-End Assurance (section 7.4).

7.2 OSRP

7.2.1 The OSRP acts on behalf of the DOESB, to provide assurance of compliance with this policy. The OSRP shall provide independent assurance of inherent OME safety as a component of the MOD's assurance regime, through review of the OME Safety Submissions produced by PTs at key stages in the project lifecycle. If the submission is deemed acceptable the OSRP will:

- a. Endorse the OME Risk Level claimed.
- b. Undertake a proportionate review of the evidence underpinning the arguments.
- c. Provide assurance⁴ that the arguments contained within the OME Safety Submission meets the requirements of JSP520, subject to any caveats, provisos and limitations.
- d. Provide constructive feedback to the PT about the suitability of the OME Safety Submission.
- e. Issue a CSOME supporting the arguments presented within the OME Safety Submission, as part of the assurance process. It should be noted that the CSOME becomes valid when the conditions of any provisos are met.

7.2.2 If the OSRP is not satisfied with the submission, the OME PTL will be formally informed of the panel's decision and reasons for rejection in writing.

7.2.3 A CSOME review date shall be set by the OSRP panel; and will be commensurate to the OME's Risk Level Category and any identified limitations.

7.2.4 A CSOME will automatically lapse upon its review date. Continued certification shall require the PTL, prior to the CSOME review date, to submit an OME Safety Submission to

⁴ Adequate confidence and evidence, through due process, that safety requirements have been met.

the OSRP. The OSRP shall seek to review the continued validity of certification at the defined review dates. Failure to renew the CSOME shall result in OSRP being unable to provide continued assurance of the OME Inherent safety. Therefore, the OSRP Secretariat shall notify the PTL and report it to the DOESB.

7.2.5 The OSRP review process shall be conducted in accordance with JSP520 Part 2, Leaflet E1: OSRP Process. The function of the OSRP will be managed in accordance with the OSRP Manual (Ref.23).

7.3 Audits

7.3.1 The purpose of an audit is to ensure that OME systems comply with MOD policy, statutory requirements and internal processes for safety and environmental management. It provides a systematic and independent examination of an OME's SEMS to determine its effectiveness. An audit is also used to verify that:

- a. An OME SEMS is operating effectively and is understood, in accordance with the Safety and Environmental Management Plan.
- b. The Safety and Environmental Case is valid and fit for purpose.

7.3.2 Periodic audits validate the effectiveness of an OME SEMS, and enables any deficiencies to be addressed by appropriate and timely action. Organisations with OME equipment/systems shall be subject to regular audits of its SEMS. 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.

7.3.3 Arrangements shall be in place for completion of corrective actions arising from audits, recording who is responsible for those actions and when they will be completed.

7.3.4 Where appropriate (e.g. projects containing complex systems or significant safety risk) it is recommended that an ISA be appointed to undertake an independent review to confirm that the safety regime has been implemented in accordance with the policy. Guidance on Audits are provided in JSP520 Part 2, Leaflet E2: Audit.

7.4 End to End Assurance

7.4.1 This section shall be used by the following TLBs and not for PT implementation: Head of Capability (HOC), Joint Support Chain Service (JSCS), Defence Estates (DE), Air, Land, Fleet, and Permanent Joint Headquarters (PJHQ).

7.4.2 JSP815 (Chapter 3, Ref.1) requires the DOESB to provide independent evidence based End-to-End (E2E) assurance to the Defence Board, through the DESB, that safety and, where appropriate, environmental protection related processes are defined, effective and complied with across the Department and that the systems and processes in place achieve appropriate levels of personnel safety, (workforce, contractors and members of the public), through-life safety of equipment and, where appropriate, protection of the environment.

7.4.3 E2E Assurance model and its implementation within the OME domain is detailed within JSP520 Part 2, Leaflet E3: End-To-End (E2E) Assurance. This model will enable the DOESB to provide the DESB with independent, evidence based assurance that TLBs are operating effective and coherent Safety and Environmental Management Systems. This is consistent with the approach of the SESB and LSESB.

7.4.4 TLBs shall report its E2E assurance in accordance with the ACOP detailed in JSP520 Part 2, Leaflet E3: End-To-End (E2E) Assurance, at each meeting of the DOESB. Its

purpose is to establish conflicts in reporting in order that the effectiveness of TLB Safety and Environmental Management Systems, and their interfaces, may be tested.

7.4.5 Where conflicts arise the DOSG-SMO shall audit, as directed by the DOESB, to establish where there may be weaknesses in management systems. The TLBs' reports will also be used to provide the basis of the annual DOESB Assurance Report to the DESB.

7.4.6 Individual authority responsibilities for E2E Assurance can be found in JSP520 Part 2 Leaflet B2: Roles and Responsibilities.

8 Definitions, Acronyms and Abbreviations

8.1 Definitions

8.1.1 The definitions used in JSP520 Parts 1 and 2 are presented below. Where the source of the definition is blank, the term is defined in the context of JSP520.

Term	Definition	Source
Accident	An unintended event, or sequence of events, that causes harm.	Def Stan 00-56/4 (Ref.25)
Accident Sequence	The progression of events that results in an accident.	Def Stan 00-56/4, (Ref.25)
Approved Codes of Practice (ACOPs)	Guidance which supplements the policy and provides guidance on compliance with the policy. Non-compliance does not constitute a breach of the policy, but ACOPs are used as evidence of failure to do all that was reasonably practicable to comply with the policy. The term ACOP was originally introduced by Section 16 of the Health and Safety at Work etc Act 1974 by which the Health and Safety Commission may approve industrial standards and working practices which meet the requirements of a particular set of Regulations.	Adapted HSWA 1974
Acquisition	The activities of setting and managing requirements, negotiating and managing contracts, project and technology management, support and termination or disposal based on a through life approach to acquiring military capability.	Defence Acquisition Handbook, Edition 1
Acquisition Operating Framework	The Acquisition Operating Framework (AOF) is the authoritative source of policy and good practice for all members of the UK MOD and our Industry partners concerned with acquisition. It has replaced the Acquisition Management System (AMS). Website: http://www.aof.mod.uk/	Defence Acquisition Handbook, Edition 1
Agree	To agree that a document fairly represents the current situation, within the scope of knowledge of the signatory.	
ALARP	As Low As Reasonably Practicable. A risk is ALARP when it has been demonstrated that the cost of any further Risk Reduction, where the cost includes the loss of defence capability as well as financial or other resource costs, is grossly disproportionate to the benefit obtained from that Risk Reduction.	Def Stan 00-56/4, (Ref.25)
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 00-56/4, (Ref.25)
Assurance	Adequate confidence and evidence, through due process, that safety requirements have been met.	Def Stan 00-56/4, (Ref.25)

Term	Definition	Source
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 detailed ALARP demonstration, although risk should be reduced wherever reasonably practicable.	Adapted Def Stan 00-56/4, (Ref.25)
Can	A statement of possibility or capability, whether material, physical or causa	Adapted ISO/IEC Directives Part 2.
Caveat	A cautionary remark'. Additional information that does not restrict use or demand any specific action to satisfy the requirements of JSP520.	
Consequence	The outcome, or outcomes, resulting from an event.	Def Stan 00-56/4, (Ref.25)
CSOME	Certificate of Safety Ordnance, Munitions and Explosives - is a supporting declaration (based on a proportionate review) by the OSRP for the arguments and underpinning evidence presented within the OME Safety Submission, as part of the DOESB and Project Team's assurance process.	
Duty Holder	A MOD party with specific responsibilities for the safety management of the system.	Def Stan 00-56/4, (Ref.25)
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.2)
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. Note 1: The term explosive material includes solid and liquid high explosives, propellants and pyrotechnics. Note 2: It also includes pyrotechnic substances even when they do not evolve gases. Note 3: The term explosive is often used in short for explosive material.	AOP-38, (Ref.8)

Term	Definition	Source
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.	Def Stan 00-56/4, (Ref.25)
Hazard	Potential source of harm.	ISO IEC Guide 51, (Ref.31)
Hazard Footprint	<p>A statement summarising hazards identified within a safety case, the full mitigation of which is outside the control of a Duty Holder and likely to affect third parties. This concept helps to communicate the effects of hazards or accident sequences and their implications for third parties. The format of this communication will cover both consequences (under the precautionary principle) and the estimated risks (under the proportionality principle).</p> <p>The concept of hazard footprints has been developed to facilitate the consideration of risks for a mobile system or platform and between equipment/systems and platforms, which may interact with their surroundings, under different contexts and operational scenarios.</p>	Adapted JSP 430 (Ref.3)
Hazard Identification	The process of identifying and listing the hazards and accidents associated with a system.	Def Stan 00-56/4, (Ref.25)
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 00-56/4, (Ref.25)
Head of Establishment	Duty Holder with authority over and responsibility for the activities within a MOD establishment (site, building, facility or range) (including those in command of ships and submarines).	JSP815 (Ref.1)
Human Factors	The systematic application of relevant information about human capabilities, limitations, characteristics, behaviours and motivation to the design of systems.	Def Stan 00-56/4, (Ref.25)
Implementation	The enactment of those SEMS 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 00-56/4, (Ref.25)

Term	Definition	Source
Independent Safety and Environmental Auditor	An individual or team, from an independent organisation, that undertakes audits and other assessment activities to provide assurance that safety and environmental 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.	Adapted Def Stan 00-56/4, (Ref.25)
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
Limitation	A constraint endorsed by an OSRP on the scope of the operational envelope of a munition, which may preclude it, being used in the intended manner. Normally associated with the lack of evidence that the munition is safe in a specified environment, or conversely that insufficient evidence has been presented to demonstrate that risks are ALARP.	
Lines of development	Concepts and doctrine, personnel, Equipment & Technology, Infrastructures & Estates, Sustainability, Training.	MOD's Acquisition Operating Framework (AOF)
May	A course of action permissible by the policy.	Adapted ISO/IEC Directives Part 2.
Mitigation Strategy	A measure that, when implemented, reduces risk.	Def Stan 00-56/4, (Ref.25)
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.8)
Must	An external regulatory requirement.	Adapted ISO/IEC Directives Part 2.
OME PTL	The MOD Duty Holder with specific responsibilities for the safety and environmental management of an OME system. This party will normally be the OME Project Team Leader, or equivalent posting; and has been delegated responsibility via a Letter of Delegation.	JSP520
Operating Environment	The total set of all external natural and induced conditions to which a system is exposed at any given moment.	Def Stan 00-56/4, (Ref.25)
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.8)

Term	Definition	Source
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
Precautionary Principle	The precautionary Principle is applied in the circumstances where there are reasonable grounds for concern that an activity is, or could, cause harm but where there is uncertainty about the probability of the risk and the degree of harm.	MOD's Acquisition Operating Framework (AOF)
Proviso	An action required of the OME SMS that must be completed to fully demonstrate that a particular risk is ALARP. It will usually arise from the Hazard Log such as an action requiring completion of some outstanding trial, provision of safety data or plans to monitor throughout the life of the munition. A CSOME becomes valid when the conditions of a Proviso are met.	
Rigorous	Extremely thorough and accurate as well as strictly applied and followed.	Def Stan 00-56/4/Pt2, (Ref.25)
Risk	Combination of the likelihood of harm and the Severity of that harm.	Def Stan 00-56/4, (Ref.25)
Risk Analysis	Systematic use of available information to describe the hazards in an accident sequence associated with a system, and Estimate risk.	Adapted IEC 51, (Ref.31)
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 00-56/4, (Ref.25)
Risk Reduction	The systematic process of reducing risk.	Def Stan 00-56/4, (Ref.25)
Safety Argument	A logically stated and convincingly demonstrated reason why safety requirements are met.	Def Stan 00-56/4/Pt2, Ref 7
Safety Audit	A 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.25)
Safety and environmental Case	A structured argument, supported by a body of evidence that provides a compelling, comprehensible and valid case that a system is safe for given applications in a given operating environment.	Adapted Def Stan 00-56/4, (Ref.25)

Term	Definition	Source
Safety and Environmental Case Report	A report that summarises the arguments and evidence of the Safety and Environmental Case, and documents progress against the safety programme.	Adapted Def Stan 00-56/4, (Ref.25)
Safety and Environmental Committee	A group of stakeholders that exercises, oversees, reviews and endorses safety and environmental management and safety and environmental engineering activities.	Adapted Def Stan 00-56/4, (Ref.25)
Safety Management	The application of organisational and management principles in order to achieve safety with high confidence.	Def Stan 00-56/4, (Ref.25)
Safety and Environmental Management Plan	A document that defines the strategy for addressing safety and the environment, and documents the Safety and Environmental Management System for a specific project.	Adapted Def Stan 00-56/4, (Ref.25)
Safety and Environmental Management System	The organisational structure, processes, procedures and methodologies that enable the direction and control of the activities necessary to meet safety and environmental requirements and policy objectives.	Adapted Def Stan 00-56/4, (Ref.25)
Safety Programme	The part of a Safety Management Plan documenting safety time scales, milestones and other date-related information.	Def Stan 00-56/4, (Ref.25)
Safety and Environmental Requirement	A requirement that, once met, contributes to the safety/environment of the system or the evidence of the safety/environment of the system.	Def Stan 00-56/4, (Ref.25)
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.17)
Senior Manager	A person within MOD with management responsibility for Duty Holders or with accountability to the DOESB.	
Shall	Indicates a requirement strictly to be followed in order to conform to the policy and from which no deviation is allowed.	Adapted ISO/IEC Directives Part 2.
Should	Among several possibilities one is recommended as particularly suitable, without excluding others or that a certain course of action is preferred but not necessarily required.	Adapted ISO/IEC Directives Part 2.
Subject Matter Expert	Person who has specific knowledge or expertise in a defined area. May be called upon to support the audit team.	POSMS (Ref.6)
Sub-System	A system that is an element of another system.	Def Stan 00-56/4, (Ref.25)

Term	Definition	Source
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 00-56/4, (Ref.25)
Third party	A person or persons who are not classed as Ministry of Defence personnel e.g. Contractors, General Public, etc.	
Tolerable	A risk is Tolerable when it is at a level that can be accepted.	Adapted Def Stan 00-56/4, (Ref.25)
Tolerability Criteria	Quantitative or qualitative measures for determining whether a risk is unacceptable, tolerable or broadly acceptable.	Def Stan 00-56/4, (Ref.25)
Unacceptable	A level of risk that is tolerated only under exceptional circumstances.	Def Stan 00-56/4, (Ref.25)
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 00-56/4/Pt2, (Ref.25)
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 00-56/4/Pt2, (Ref.25)
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 00-56/4/Pt2, (Ref.25)
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 (Ref.32)
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 (Ref.32)

8.2 Acronyms and Abbreviations

8.2.1 The acronyms and abbreviations contained in JSP520 Parts 1 and 2 are presented below.

2 nd PUS	Second Permanent Under Secretary
ACH	Air Carriage Hours
ACOP	Approved Code Of Practice
ADR	Accord Dangerous Routiers (The European Agreement concerning the International Carriage of Dangerous Goods by Road) the International Carriage of Dangerous Goods by Road).
AECTP	Allied Environmental Conditions and Test Publications
AESP	Army Equipment Support Publication
ALARP	As Low As Reasonably Practicable
ALGWR	Air Launched Guided Weapons Release
ALW	Air Launched Weapon
AOF	Acquisition Operating Framework
AOP	Allied Ordnance Publication
AOSP	Army Operational Shooting Policy
ASD	Aircraft Self Damage
ASDAWC	Aircraft Self Damage from Aircraft Weapons Committee
ASEG	Acquisition Safety and Environmental Group
ASEMS	Acquisition Safety and Environmental Management System
ASIC	Application Specific Integrated Circuits
AT	Air Transport
AUR	All-Up Round
AWAC	Aircraft Weapon Advisory Committees
AWBC	Aircraft Weapons Ballistic Committee
BSO	Broad Side On
BTCA	Breakdown, Test and Criticality Analysis
CA	Competent Authority
CBI	Confederation of British Industry
CCS	Chief of Corporate Services
CDM	Chief of Defence Materiel
CDRL	Contract Data Requirements List
CE/DE	Chief Executive of Defence Estate
CED	Complex Electronic Devices
CEE	Complex Electronic Elements
CESO	Chief Environment and Safety Office
CHS	Cartridge Headspace
CIE(MOD)	Chief Inspector of Explosives (Ministry of Defence)
CJO	Chief of Joint Operations
CM	Capability Manager
CofD	Certificate of Design
CoM	Chief of Materiel
COMAH	Control of Major Accident Hazards
COO	Chief Operating Officer
COTS	Commercial Off The Shelf
CS	Capability Sponsor
CSA	Customer Supplier Agreement
CSE	Certificate of Safety - Explosives
CSOME	Certificate of Safety Ordnance, Munitions and Explosives
D JSC	Director Joint Supply Chain
D S&E	Director Safety & Engineering
D S&EP	Director Safety & Environmental Protection
D S&T	Director Safety & Technology
D Weapons	Director Weapons

DA	Design Authority
DCDS(EC)	Deputy Chief of Defence Staff (Equipment Capabilities)
DE	Defence Estate
DE&S	Defence Equipment and Support
Def Stan	Defence Standard
DESB	Defence Environment and Safety Board
DETR	Department of the Environment, Transport and the Regions
DF&GSB	Defence Fuels and Gases Safety Board
DFL	Departmental Functional Lead
DfT	Department for Transport
DG	Dangerous Goods
DGAC	Dangerous Goods by Air Carriage
DGM PT	Defence General Munitions Project Team
DIN	Defence Instructions and Notice
Dir(PA)	Director Precision Attack
DJtCap	Director Joint Capabilities
DLRSC	Defence Land Ranges Safety Committee
DMTMC	Defence Movements and Transport Management Committee
DNESB	Defence Nuclear Environment Safety Board
DOESB	Defence Ordnance Environment and Safety Board
DOSG	Defence Ordnance Safety Group
DOSG-PRTL	DOSG Policy and Regulation Team Leader
DOSG-SMO	Defence Ordnance Safety Group Safety Management Office
DOSG-WS	DOSG Weapons Systems
DP	Drill Purpose
DSTL	Defence Science and Technology Laboratory
E ³	Environmental Electromagnetic Effects
E2E	End-to-End
EA	Environmental Agency
EBA	External Business Agreement
EHDS	Explosives Hazard Data Sheet
eHIATs	Electronic Manual of Hazard Impact Area Traces
EIG	Explosives Industry Group
EM	Energetic Materials
EMC	Electro Magnetic Compatibility
EMP	Environmental Management Procedure
EMTAP	Energetic Materials Testing Assessment Policy Manual of Tests
ENOHD	Extended Nominal Ocular Hazard Distance
EOC	Explosive Ordnance Clearance
EOD	Explosive Ordnance Disposal
EPA	Environmental Protection Act
EPVAT	Electronic Pressure Velocity Action Time
ERD	Environmental Requirements Document
ERW	Explosive Remnants of War
ESA	Explosives Substances and Articles
ESTC	Explosives Storage and Transport Committee
ETA	Event Tree Analysis
EU	European Union
FLC	Front Line Command
FPGA	Field Programmable Gate Arrays
FPP	Firing Pin Protrusion
FSB	Functional Safety Board
FSO	Functional Safety Office
FTA	Fault Tree Analysis
GARP	Generic Aircraft Release Procedure
GOCO	Government Owned Contractor Operated
HE	High Explosives

HIATs	Hazard Impact Area Traces
HOC	Head Of Capability
HOE	Head Of Establishment
HSC	Health and Safety Commission
HSE	Health and Safety Executive
HSWA	Health and Safety at Work Act 1974
IBA	Internal Business Agreement
IE	Inspectors of Explosives
IM	Insensitive Munitions
IMAP	Insensitive Munitions Assessment Panel
IMEMG	Insensitive Munitions European Manufacturers' Group
IMIP	Insensitive Munitions Implementation Plan
IMIS	Insensitive Munitions Implementation Strategy
IMO	International Maritime Organisation
IPR	Intellectual Property Rights
ISA	Independent Safety Auditor
ISD	In Service Date
ISS	In Service Surveillance
ITEAP	Integrated Trials, Evaluation and Assessment Programme
JBA	Joint Business Agreement
JDCC	Joint Doctrine and Concepts Centre
JIMSG	Joint Insensitive Munitions Strategy Group
JSIO	Joint Service Intelligence Organisation
JSMCR	Joint Services Munitions Control Register
JSP	Joint Services Publication
JTRC	Joint Technical Requirements Committee
KUR	Key User Requirements
LBOSS	Letter Based OME Safety Submission
LCEP	Life Cycle Environmental Profile
LESSB	Land Environment and Systems Safety Board
LFTTA	Live Firing Tactical Training Areas
LHZ	Laser Hazard Zone
LSP	Laser Safety Paper
MLSRP	Military Laser Safety Review Panel
LSSO	Land Systems Safety Office
LWPB PT	Light Weapons, Photographic and Batteries Project Team
MACR	Major Accident Control Regulations
MACR (CA)	Major Accident Control Regulations Competent Authority
MAR	MOD Airworthiness Regulator
MARSB	MOD Aviation Regulatory Safety Board
MID	Munitions Incidents Database
MIL-STD	Military Standard
MLA	Munitions Life Assessment
MLRSCC	Military Laser Range Safety Clearance Certificate
MLSC	Military Laser Safety Committee
MLSSAC	Military Laser System Safety Assessment Certificate
MLTSCC	Military Laser Trial Safety Clearance Certificate
MOD	Ministry Of Defence
MOTS	Military Off The Shelf
MSER	Manufacture and Storage of Explosives Regulations
MTDS	Manufacture to Target or Disposal Sequence
NA EXP	Naval Authority Explosives
NATO	North Atlantic Treaty Organisation
NDT	Non-Destructive Testing
NEAS	Naval Environment Assessment Statement
NOHD	Nominal Ocular Hazard Distance
NOS	National Occupational Standards

NSPLW	Non Service Pattern Light Weapons
OB	Ordnance Board
OEC	Operational Emergency Clearances
OHSB	Occupational Health & Safety Board
OME	Ordnance, Munitions and Explosives
OSD	Out of Service Date
OSRP	OME Safety Review Panel
OSRPMB	OME Safety Review Panel Management Board
OT	Operational Theatre
Pam	Pamphlet
PATO	Principal Ammunition Technical Officer
PBX	Polymer-Bonded Explosives
PHA	Preliminary Hazard Analysis
PJHQ	Permanent Joint Headquarters
PJOB	Permanent Joint Operating Base
POEMS	Project Oriented Environmental Management System
POSMS	Project Oriented Safety Management System
PPE	Personal Protection Equipment
Proc	Procedure
PRTL	Policy and Regulation Team Leader
PT	Project Team
PTL	Project Team Leader
PUS	Permanent Under Secretary
RAF	Royal Air Force
RAO	Research Acquisition Organisation
RCS	Risk Control System
RFA	Royal Fleet Auxiliary
RID	<u>R</u> eglement <u>I</u> nternational <u>D</u> angereuses (Regulations concerning the International Carriage of Dangerous Goods by Rail) the International Carriage of Dangerous Goods by Road)
RIDDOR	Report of Injuries Diseases and Dangerous Occurrences Regulations
RMAS	Royal Maritime Auxiliary Service
RMCS	Royal Military College of Science
RN	Royal Navy
RSP	Render Safe Procedures
RTS	Release To Service
RTSA	Release To Service Authority
S ³	Safe and Suitable for Service
SA	Small Arms
SAA	Small Arms Ammunition
SAFU	Safety Arming and Fuzing Unit
SCJ	Shaped Charge Jet
SD	Self Damage
SECR	Safety and Environmental Case Report
SEMC	Safety and Environment Management Committee
SEMP	Safety and Environment Management Plan
SEMS	Safety and Environmental Management System
SEP	Safety and Environment Panel
SESB	Ship Environment and Safety Board
SFAIRP	So Far As Is Reasonably Practicable
SG	Support Group
SHA	System Hazards Analysis
SHE	Safety, Health and Environment
SLA	Service Level Agreement
SME	Subject Matter Expert
SMO	Safety Management Office
SMP	Safety Management Procedure

SofS	Secretary of State
SOLAS	Safety of Life at Sea
SOTR	Statement of Trained Requirements
SQEP	Suitably Qualified and Experienced Person
SRD	Systems Requirement Document
SSMO	Ship Safety Management Office
STANAG	NATO Standardization Agreement
TA (Ex)	Technical Adviser (Explosives)
TEA/Z	Total Energy Area/Zone
TEACASE	Thermal Effects on Airborne Conventional Armament Stores and Equipment
TFA	Trading Fund Agency
THA	Threat Hazard Assessment
TLB	Top Level Budget holder
TLMP	Through Life Management Plan
TOR	Terms Of Reference
UN	United Nations
UOR	Urgent Operational Requirement
URD	User Requirements Document
USofS	Parliamentary Under Secretary of State
WDA/Z	Weapon Danger Area/Zone
WHT	Weapon Handling Tests
WOC	Weapon Operating Centre

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