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# MOD

## Defence Equipment and Support

# Acquisition Safety and Environmental Management System (ASEMS)

## *Project - Oriented Safety Management System Manual (POSMS)*

Release Version 2.2s – November 2007

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### Record of Revisions

Date	Version	Description of Revision
28 July 2004	ASEMS – Project-Oriented Safety Management System Manual RELEASE V2.0s	Release Version 2.0s is the first operational release of the POSMS Manual. The release includes Manual Text and all Core Procedures (SMP01- SMP13).
May 2005	ASEMS – Project-Oriented Safety Management System Manual RELEASE V2.1s	Release Version 2.1s is the second operational release of the POSMS Manual. The release includes Manual Text and all Core Procedures (SMP01- SMP13) and Support Procedures (SSP01-SSP03).  Chapter 8 Assurance and Audit Procedures, including AAP01-AAP04, is included at Draft status.  The update includes changes to reflect organisational restructuring (AESO changed to ASEG, and references to CESO(DLO) removed), clarification of vocabulary, and cosmetic changes such as typo corrections, formatting and paragraph numbering.
Sep 2005	POSMS Chapter 8 + 9	Chapter 8 Assurance and Audit Procedures, including AAP01-AAP04, is raised to full issue v2.1e/s.  Chapter 9 Glossary updated to reflect changes in Chapter 8.
Jan 2006		Revision sheet revised.
Nov 2007	ASEMS – Project-Oriented Safety Management System Manual RELEASE V2.2s	Release Version 2.2s is the third operational release of the POSMS manual. The release includes Manual Text and all Core Procedures (SMP01 – SMP13), Support Procedures (SSP01 – SSP03) and Assurance and Audit Procedures (AAP01 – AAP04).  The update includes changes to reflect organisational restructuring (DLO and DPA changed to DE&S) and various minor changes such as typo corrections and formatting.

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## 1 INTRODUCTION

- 1.1.1 The purpose of this document is to explain the contents and operation of the Safety Management element of MOD's Acquisition Safety and Environmental Management System (ASEMS). This element is known as the Project-Oriented Safety Management System (POSMS). The other element of ASEMS is the Project-Oriented Environmental Management System (POEMS) which has a separate, although closely related, manual.
- 1.1.2 This document describes the Safety Management processes and procedures to be employed during a project's life cycle by DE&S and contractors working for them. It will enable DE&S project teams to develop and operate at the project level, Safety Management Systems, that are appropriate for discharging their delegated responsibilities and satisfying the requirements defined in Legislation, Departmental Policy and Domain-specific Policy set by MoD's Functional Safety Boards (FSBs).
- 1.1.3 The POSMS stresses the importance of identifying and consulting with stakeholders and Subject Matter Experts so that project teams can discharge their delegated responsibilities. Safety can only be achieved and sustained through co-ordinated effort by authorities with responsibilities for operation, maintenance, training as well as design, manufacture and upkeep. The POSMS is intended for application by DE&S and their contractors, but it also contains information which may be useful to other authorities with different responsibilities.
- 1.1.4 Reduction of safety risk for all activities undertaken by the MOD has been recognised for many years both in terms of Occupational Health and Safety as required by Law, and functional safety of equipment, systems, platforms and services (hereinafter referred to as 'equipment and services') that have the potential to cause unintentional harm.
- 1.1.5 The need to manage and control safety risk has been recognised and the requirement for safety management resulting from National and International Legislation is defined in MOD Policy and specific Regulatory requirements. It is a requirement that MOD can demonstrate that it has put in place appropriate management controls and procedures to identify and manage potential safety risks throughout the life of its many projects.
- 1.1.6 Project risk, and hence risk to operational effectiveness, resulting from safety issues can be manifest in many different ways. The main categories being:
- Cost;

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- Delays;
- Legal non-compliance;
- Reputation damage;
- Death and/or injury to operators, other military personnel and third parties.

1.1.7 In addition to MOD Departmental Policy, there are also a number of MOD Joint Service Publications (JSPs) that define the Policy and identify specific Regulatory requirements within the areas of Land, Sea, Air, nuclear propulsion, Ordnance Munitions and Explosives. In these JSPs each of these areas has defined its own and slightly differing way of managing safety. In some cases this has led to difficulties in aligning safety requirements when acquiring items that are to be used across the policy areas.

1.1.8 Therefore to ensure a consistent and coherent approach with meeting these policies and their statutory obligations the DE&S have decided to implement the POSMS, under the umbrella of the ASEMS, to define generic Safety Management requirements for all acquired equipment and services, and to ensure that they are assessed and managed for safety in a coherent and consistent way.

## **1.2 Application**

1.2.1 The procedures and processes contained in the POSMS, apply to and are to be followed by all those to whom the CDM has delegated authority for the management of safety issues in equipment and services procured and managed through the DE&S.

## **1.3 Relationship to MOD Policy and Domain Requirements**

1.3.1 These procedures have been designed to provide those with delegated authority for safety management issues with a mechanism by which they may achieve and demonstrate those responsibilities.

1.3.2 At the top level MOD Policy and requirements can be found in The Secretary of State's Safety, Health and Environmental Protection Statement <sup>1</sup>. Domain specific policy and requirements for the management of Safety and Environment in relation to the equipment and services MOD procure, support and operate can be found in a series of Joint Service Publications (JSP) published by the MOD Functional Safety Boards:

<sup>1</sup> Policy Statement in Safety, Health and Environmental Protection in the MOD (December 2006)

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**Safety Health Environment and Fire Board (SHEFB)**, publish JSP 375 MOD Health and Safety Handbook and JSP 418 MOD Sustainable Development and Environmental Management Handbook.

**MOD Aviation Regulatory and Safety Board** publishes JSP 55x series covering aviation safety.

**Ship Safety Board (SSB)** publishes JSP 430 MOD Ship Safety Management.

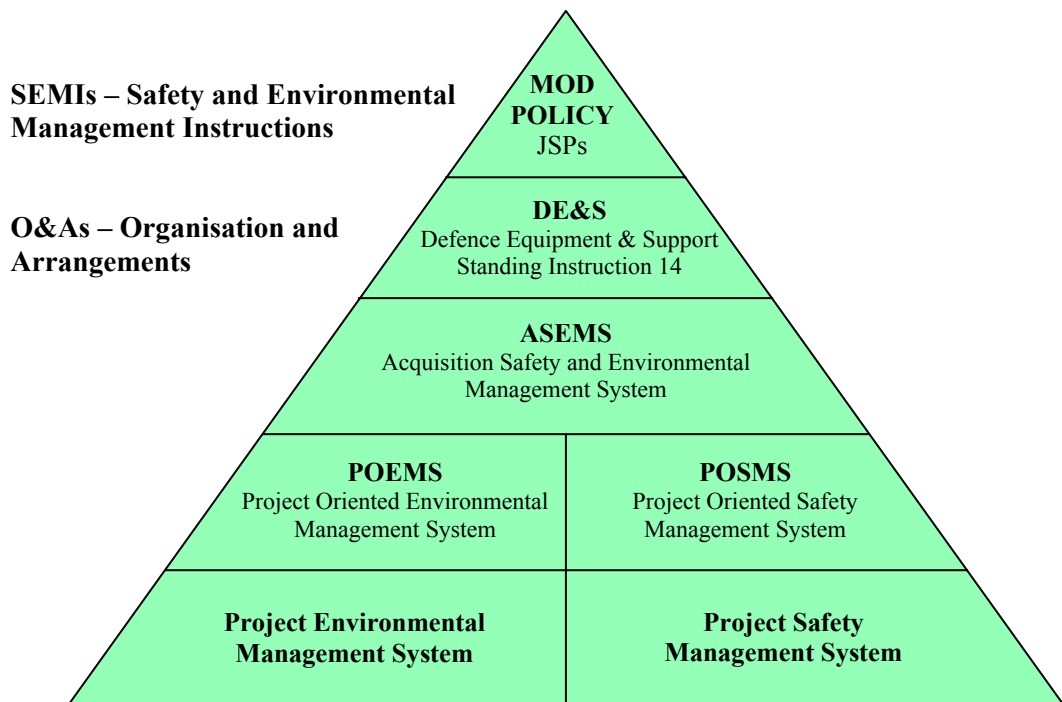
**Land Systems Safety Board (LSSB)**, publishes JSP 454 MOD System Safety and Environmental Assurance for Land Systems.

**Defence Ordnance Safety Board (DOSB)**, publishes JSP 520 UK MOD's Ordnance, Munitions And Explosives Safety Management System.

**Defence Nuclear Safety Board (DNSB)**, publishes JSP 518 Regulation of Naval Nuclear Propulsion Programme and JSP 538 Regulation of the Nuclear Weapon Programme.

1.3.3 The relationship between the JSPs, this document and the Manuals is shown in Figure 1.1 below:

**Figure 1.1 Relationship of MOD Environment and Safety Documentation**



1.3.4 The POSMS is designed to cover the work of Integrated Project Teams/Integrated Business Teams (hereinafter referred to as IPTs), to comply with Government and

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MOD policy and meet stakeholder expectations, and improve consistency in safety management across all IPT acquisition projects. In essence, the aim of the POSMS is to assist the identification and assessment of potential safety risks associated with acquired equipment and systems, in order for this information to inform the design, manufacture, use, and disposal stages of the item's life cycle.

- 1.3.5 The principal benefits arising from implementing ASEMS will be to demonstrate that MOD's safety and environmental policy is being achieved in the acquisition process consistently and in a structured and formal way. The POSMS will bring about improvements in safety management and corresponding reduction of project risk resulting from safety issues. There will be cost benefits through saving on reworks and delays brought about by the late identification of significant safety issues.

## 1.4 Document Contents and Structure

- 1.4.1 This document is organised into the following main sections:

Section	Title
1.	Introduction to the POSMS
2.	Description of the POSMS
3.	POSMS Management and Responsibilities
4.	How To Do It
5.	POSMS Process Maps
6.	Core Procedures
7.	Support Procedures
8.	Assurance and Audit Procedures
9.	Glossary and Abbreviations

## 1.5 Document History

- 1.5.1 This Release Version 2.2s is the third release of the Manual Text and Core Procedures, and second release of the Support Procedures and Assurance and Audit (A&A) Procedures. It is designed for use by IPTs in equipment and services acquisition projects

- 1.5.2 Future development of the Manual and its content will result in the issue of updated versions. Document, quality and version control of the Manual will be managed by the Acquisition Safety and Environmental Group (ASEG). It is important that readers of the Manual and Procedures verify that they are accessing the current approved version.

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- 1.5.3 Earlier versions of this document were produced as development or consultation documents. These should not be used and should be discarded or replaced by this current version.
- 1.5.4 Readers should note that Version 2.2s relates to the POSMS and Version 2.2e relates to the POEMS. Whilst the current version numbers for the POSMS and POEMS are the same it should be expected that over time different version issues may be undertaken. Version number realignment between the POSMS and POEMS will be undertaken only at major version re-issues.
- 1.5.5 This document, the POSMS Manual, is a controlled document within the POSMS. It has been developed in consultation with major MOD stakeholders.

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## **2 DESCRIPTION OF THE POSMS**

### **2.1 Overview**

2.1.1 The POSMS describes processes and procedures which are designed to assist with the identification and management of the safety risks of equipment and services throughout the acquisition process. In doing so the POSMS seeks to assist IPTs identifying the safety risks through application of hazard identification and assessment methodologies, to apply appropriate mitigation measures to eliminate or reduce safety risks to levels which are tolerable and As Low As Reasonably Practicable (ALARP) and to identify and manage any residual safety risk on acquisition projects. The POSMS is based on a series of procedures which together create a conventional “Plan-Do-Check-Act” approach to the management of safety issues.

### **2.2 POSMS Scope**

2.2.1 The scope of the POSMS is limited to acquisition projects for equipment and services, and excludes procurements made outside the DE&S. It includes the safety issues relating to the environment (eg health and safety risk from use of hazardous materials) and hence overlaps with some of the aspects of the POEMS. It excludes occupational health and safety (OH&S) within the workplace of DE&S which is covered elsewhere. It does however include OH&S issues associated with handling and operation of the equipment and services being acquired.

2.2.2 The POSMS deals with the potential safety impacts of equipment and services within their specified sphere of operation including risks associated with storage and transportation. The POSMS applies to all stages of the project life cycle from Concept through to Disposal, including any development or trials activities.

### **2.3 POSMS Structure**

2.3.1 The procedures contained within the POSMS fall conveniently into three blocks, these are:

- The Core Procedures
- The Support Procedures
- The Assurance and Audit Procedures

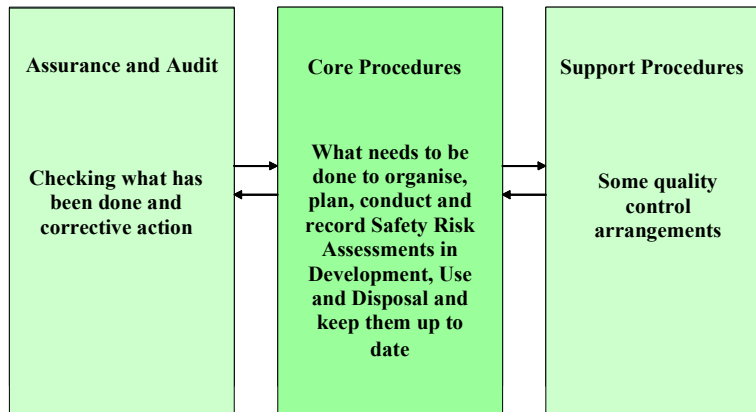
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**Figure 2.1 The three blocks of Procedures**

**POSMS Procedures-Safety Management System**



2.3.2 The Core Procedures (see Section 6) cover the main tasks and activities required by the POSMS. The core procedures consist of 13 separate procedures. In outline:

- Procedures SMP01, SMP02 and SMP03 broadly cover collection and collation of relevant information and planning;
- Procedures SMP04 and SMP09 deal with undertaking and reporting Safety Risk Management as part of development;
- Procedure SMP10 relates to Safety Requirements and Contracts;
- SMP11 and SMP12 cover the management of Safety information;
- Procedure SMP13 deals with the in-service Safety Management System, including review of Safety information and preparation for the end of life.

2.3.3 The element of monitoring Safety performance of the equipment or service in usage is covered in the Support Procedures.

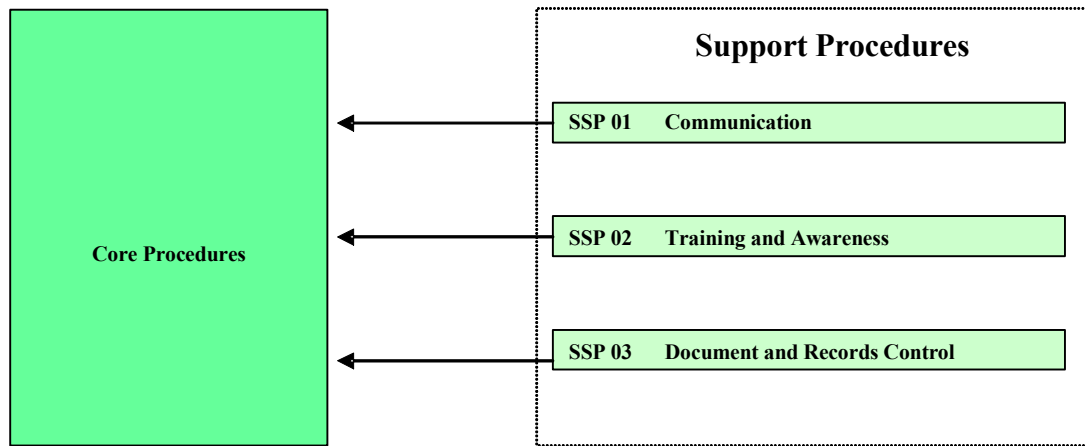
2.3.4 The Support Procedures (See Figure 2.2 and Section 7) apply management control to a number of basic project functions that are required by the POEMS and POSMS. The functions or activities dealt with by the support procedures are:

- Procedure SSP01 – Communications;
- Procedure SSP02 - Training and Awareness;
- Procedure SSP03 - Document and Record Control;

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**Figure 2.2 The Support Procedures**



2.3.5 The Assurance and Audit Procedures (See Figure 2.3 and Section 8) apply an assurance regime, on the IPT's POEMS and POSMS activities and outputs. The functions or activities dealt with by the assurance and audit procedures are:

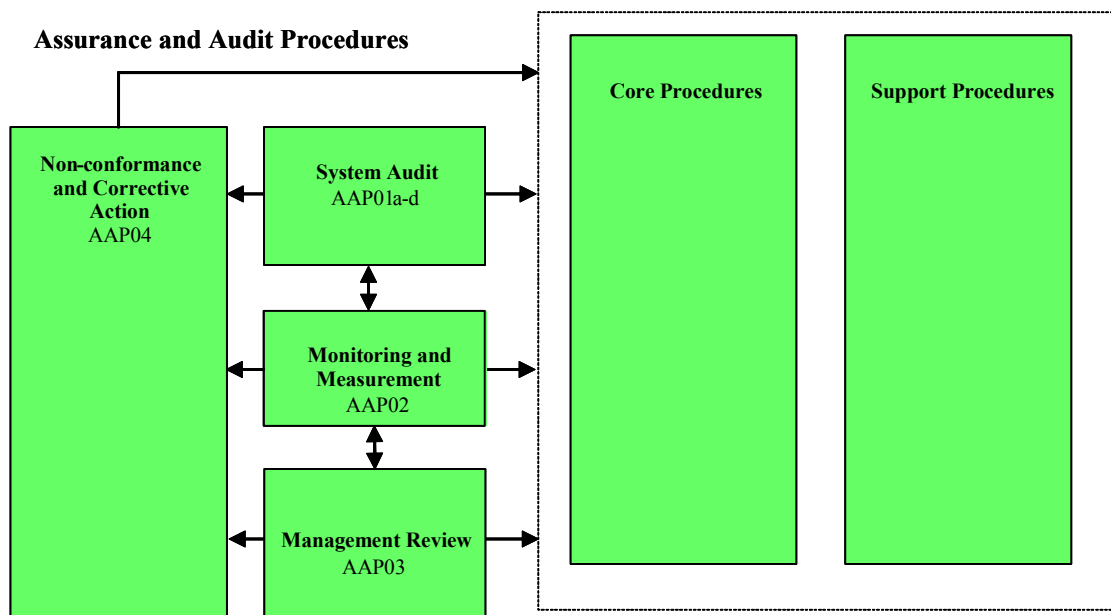
Procedure AAP01 - System Audit;

Procedure AAP02 - Management Review;

Procedure AAP03 - Non-conformance and Corrective Action.

Procedure AAP04 – Monitoring and Measurements

**Figure 2.3 The Assurance and Audit Procedures**



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## 2.4 POSMS Alignment

- 2.4.1 The POSMS is intended to be consistent with the terminology and approach of Def Stan 00-56 Issue 4.
- 2.4.2 Consideration has also been given to the specification for Occupational Health & Safety as identified in OHSAS 18001:1999. This specification aligns the requirements for Occupational Health and Safety Management Systems with those for Environmental Management Systems as defined in ISO 14001 and Quality Management Systems as defined in BS 9000:2000. Occupational Health and Safety is an integral part of safety and is therefore covered by the safety risk identification, assessment and management processes and procedures within this POSMS for acquired equipment and services.
- 2.4.3 The POSMS contains flexibility in order for it to deal with the vast range of procurement projects that IPTs are responsible for, both in terms of size of project, equipment complexity and procurement strategy employed.

## 2.5 Similarities between the POSMS and POEMS

- 2.5.1 A number of the features of POSMS have equivalent outputs or comparable requirements in the POEMS, the main ones are shown in Table 2.1 below.

**Table 2.1 Major similarities between the POSMS and POEMS**

POSMS Element	POEMS Element
Safety Committee	Environmental Committee
Hazard Identification and Analysis Risk and ALARP Evaluation Risk Estimation	Environmental Impact Assessment
Hazard Log	Environmental Feature Matrix
Safety Case	Environmental Case
Safety Case Reports	Output from the POEMS procedures
Safety Auditing	System and Equipment Performance Auditing

- 2.5.2 In recent years, many IPTs have carried out safety and environmental tasks together. Sometimes environmental issues are considered as a sub-set of safety, and IPTs produce combined Safety and Environment Cases. For instance, at the Concept stage it is likely that for most projects a combined Safety and Environment Committee will be established by the IPT. It will also be possible to carry out combined safety and environmental auditing, depending on the competencies of the auditors. The degree of 'integration' between safety and environment should be determined, and reviewed, by the IPT. The main point being to ensure that an aligned approach is adopted which fits the project.

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**Table 2.2 Cross reference between OHSAS 18001:1999 requirements and MOD POSMS**

OHSAS 18001 Requirements	POSMS Element
OH&S policy (Clause 4.2)	MOD Safety and Environment Policy
Planning for hazard identification, risk assessment and risk control (Clause 4.3.1)	SMP03 – Safety Planning
Legal and other requirements (Clause 4.3.2)	SMP01 – Project Safety Initiation JSP 375 (And other JSPs dealing with Domain-specific Safety requirements) DS&C Legislation and Policy Tracker
Objectives (Clause 4.3.3)	SMP03 – Safety Planning SMP10 – Safety Requirements and Contracts SMP13 – In-Service SMS
OH&S management programme(s) (Clause 4.3.4)	SMP03 – Safety Planning SMP13 – In-Service SMS
Structure and responsibility (Clause 4.4.1)	POSMS Manual SMP01 – Project Safety Initiation SMP03 – Safety Planning SMP13 – In-Service SMS
Training, awareness and competence (Clause 4.4.2)	SSP02 – Training and Awareness
Consultation and communication (Clause 4.4.3)	SSP01 – Communications SMP02 – Safety Committee
Documentation (Clause 4.4.4)	POSMS Manual
Document and data control (Clause 4.4.5)	SSP03 - Document and Records Control
Operational control (Clause 4.4.6)	SMP08 –Risk Reduction SMP12 – Safety Case Reports SMP13 – In-Service SMS
Emergency preparedness and response (Clause 4.4.7)	SMP08 –Risk Reduction SMP12 – Safety case and Safety Case Reports SMP13 – In-Service SMS AAP02 - Monitoring and Measurement AAP04 - Non-conformance and Corrective Action
Performance measurement and	AAP01 - System Audit

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OHSAS 18001 Requirements	POSMS Element
monitoring (Clause 4.5.1)	AAP02 - Monitoring and Measurement
Accidents, incidents, non conformance and corrective and preventive action (Clause 4.5.2)	SMP13 – In-Service SMS AAP02 - Monitoring and Measurement AAP04 - Non-conformance and Corrective Action
Records and records management (Clause 4.5.3)	SSP03 - Document and Records Control
Audit (Clause 4.5.4)	AAP01 - System Audit
Management review (Clause 4.6)	AAP03 - Management Review.

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### **3 POSMS MANAGEMENT AND RESPONSIBILITIES**

3.1.1 The POSMS is designed to identify, assess and assist in managing potential safety impacts throughout the life of the project rather than just from the design and manufacture stages. Therefore other parts of the MOD will be required to implement the activities identified in the POSMS in order to fully discharge MOD wide policy commitments.

3.1.2 The process and procedures also contain activities that will often be conducted by contractors for MOD. The procedures will help IPTs in contracting for the appropriate safety work by its Prime Contractors or for specialist safety support and in understanding what should be produced, so that it can be reviewed effectively.

3.1.3 The following provides a summary of the expected role of key MOD stakeholders in ensuring that the benefits are achieved from the operation of the POSMS.

#### **3.2 The Equipment Capability Customer and Equipment User**

3.2.1 The Equipment Capability Customer and the Equipment User will be required to inform the IPT within the URD of any specific safety issues that they are aware of and safety performance requirements that the equipment or service must meet. The Equipment Capability Customer and the Equipment User are also expected to identify what, if any, safety information they already hold, and to enter into clear agreements as to which organisation will be responsible for obtaining any location specific permits or authorisations, and related assessment for the use of the system.

#### **3.3 IPTs**

3.3.1 The IPT will be required to implement the POSMS procedures:

<b>Number</b>	<b>Procedure Name</b>
SMP01	Safety Initiation
SMP02	Safety Committee
SMP03	Safety Planning
SMP04	Preliminary Hazard Identification and Analysis
SMP05	Hazard Identification and Analysis
SMP06	Risk Estimation
SMP07	Risk and ALARP Evaluation
SMP08	Risk Reduction
SMP09	Risk Acceptance

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Number	Procedure Name
SMP10	Safety Requirements and Contracts
SMP11	Hazard Log
SMP12	Safety Case and Safety Case Report
SMP13	In-Service SMS

3.3.2 More detail on the work required in the implement each procedure can be found later in this document and also in the individual procedure documentation.

3.3.3 In addition, the IPTs will be responsible for providing information gathered on potential safety issues associated with the equipment or service to other parties as required for undertaking location specific safety assessments or studies which are required additional to the assessments completed under the POSMS. Part of the role of the IPT will be to agree and document these responsibilities on a project by project basis.

### 3.4 Operator/User/Defence Estate/Army Training Estate/IPTs

3.4.1 There may be specific operational procedures developed to mitigate safety risk, although in most instances safety mitigation will be integrated within procedures and documentation supporting the introduction and use of the equipment or service.

3.4.2 If the equipment or service, its use, or the safety requirements change from those originally identified, the change will need to be assessed for new safety risks and original safety risks identified must be reviewed and possibility revised, to identify any possible ways the new impact/risks (or increased impacts/risks) can be eliminated, reduced or controlled, eg do operational procedures require updating?

- a) **Changes to the use of the equipment or service.** For example, would include changes to where it was to be used or how it was to be used (which could include where the acquired item was to be used in combination with other systems).
- b) **Changes in the specification of the equipment or service.** For example, would include situations where changes are made to the equipment or service, in terms of materials or components, where re-assessment of the safety impacts and significance of those impacts would be required.
- c) **Changes to safety requirements or stakeholder concerns.** For example, would include changes to applicable safety legislation or policy requirements.

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3.4.3 The responsibility for completing, expanding or modifying the safety Risk Evaluations, would vary from project to project and therefore responsibility cannot be completely specified in this document. However where a Through Life IPT has been established for an equipment or service, the management of the review and revision of assessments and related plans would be the IPT's responsibility.

3.4.4 Users must be made aware of the limitations (including environments) within which the equipment or service can safely be used. Whilst these will be recorded in the Safety Case, they should also be defined in User documentation. If users are required to operate outside these limitations, including in a new environment, then the Safety Case must be revised (see above).

### **3.5 ASEG**

3.5.1 ASEG holds overall responsibility for the management and maintenance of the ASEMS. ASEG's main role is to manage the review and revision of the Safety and Environmental Management Instructions and the POSMS and POEMS Manuals in line with System developments.

3.5.2 In addition ASEG will also be responsible for:

- Leading Management Reviews of the System;
- Development of training and awareness activities to support the ASEMS;
- Providing specialist System and related knowledge to IPTs in the Concept stage of CADMID;
- Providing general guidance to IPTs in meeting the requirements of the POSMS at other stages;
- Managing the arrangements for Safety Auditing of the IPTs' implementation of the POSMS.

### **3.6 Functional Safety Management Officers/Defence Safety & Claims (Functional SMOs/DS&C)**

3.6.1 The Functional Safety Management Offices (FSMOs)/Defence Safety and Claims (DS&C) have responsibilities for the production and maintenance of Safety JSPs. FSMOs and DS&C have responsibilities for ensuring that the information contained within the JSPs on safety regulation and policy is kept-up to date and accessible to IPTs. DS&C is also responsible for the maintenance and distribution of the MOD legislation and policy tracker which, along with environment-specific Safety JSPs, provides the main MOD reference sources for the POSMS and in particular the Register of Legal and Other Significant Requirements.

3.6.2 FSMOs also provide advice to IPTs on interpretation of policy in their area and guidance on Subject Matter Experts who can provide specialist advice.

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## 4 HOW TO DO IT

### 4.1 Through Life Safety Management

4.1.1 Key to the management system is the concept of through life safety. IPTs must ensure that appropriate consideration is given to the safety issues arising from activities at each life-cycle stage, operation condition and equipment status.

4.1.2 Safety is achieved through life by:

- Planning for the whole life cycle from the earliest steps;
- Considering safety to include the effects of ‘Lines of Development’ such as supporting systems, personnel, training and facilities;
- Consultation with stakeholders;
- Setting meaningful safety requirements;
- Appointing safety-competent contractors;
- Independent safety assessment where appropriate;
- Keeping safety management arrangements and assessments under review.

4.1.3 Wherever possible, hazards should be identified and assessed as early as practicable in the acquisition cycle for a project. This is to ensure that there are no surprises down stream. It should also ensure that wherever possible, potentially adverse effects are designed out of the equipment and services, or the potential effects are mitigated by management and control arrangements. For instance, for a defence system such as a land vehicle, Safety Management activities may include:

**Table 4.1 Example conditions/status and activities associated the stages of CADMID**

CADMID	Condition/Status	Activities
Concept	Project Planning/Normal	Capability (URD) and system (SRD) requirement
Assessment	Design/Normal	Safety Risk Management (Hazard Identification and Analysis, Risk Estimation, Evaluation and Reduction)

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CADMID	Condition/Status	Activities
		to influence design development for improved Safety.
Demonstration	Testing and trials/Normal	Testing and trials of vehicle (performed Safely) Testing and trails of Safety features (eg braking performance)
Demonstration	Testing and trials/Emergency Situation	Road traffic accident, fire or explosion
Manufacturing	Manufacturing/Normal	Manufacture of components, assembly, transport to location where system will be in-service
Manufacturing	Commissioning	Integration of system with interfacing systems (eg communications, training systems)
In-service	Operation/Normal	Training activities
In-service	Operation/Abnormal	Secondary use of vehicles
In-service	Operation/Emergency	Road traffic accident, fire or explosion
In-service	Routine Maintenance/Normal	Routine servicing and repair, waste components, oils etc Inspection/testing of Safety features (user checks, periodic checks, servicing)
In-service	Deep repair and Upgrade/Normal	Replacement of worn or obsolete parts, fitting of upgrades
Disposal	Sale/Normal	Selling on of redundant vehicles
Disposal	Scrap or Recycling/Normal	Transport to site for disposal, disposal/recycling of vehicle components

4.1.4 In outline, the POSMS causes IPTs to collect information and identify requirements on the potential harm relating to the acquired item; to use this information to conduct Risk Assessments; and to use the findings to influence the design of the item and how it is used and supported.

4.1.5 In reality it will be unlikely that all potential concerns and impacts are known at the outset of a project. In fact until design freeze it is entirely possible that major

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design changes could be made, leading to subsequent changes in potential accidents. The role of periodic and planned review is therefore central to ensure that the POSMS and its findings remain relevant and up to date.

## 4.2 System of Systems

4.2.1 The POSMS has been designed to be applied at an equipment, system or platform level and to all stages during the equipment/system/platform's life cycle. However there are numerous situations where systems are used in combination with other systems, some of which may be legacy systems, and where systems are to be supplied to one or more platform projects which will be systems in themselves. It is possible that system architecture may consist of four or more layers in procurement project terms. For instance, a naval ship may be equipped with an aircraft, which may have a weapons system, which may be fitted with detection and targeting systems, each of which is being managed as a distinct project. Safety issues for all four levels of system should be coordinated in the same way that operational requirements and constraint must be coordinated.

4.2.2 In the majority of cases, the safety of the platform has primacy. Whatever the situation in practice it is important to determine whether the project stands alone (highly unlikely) or is part of a 'system of systems'. In the latter case it is important to ensure that all relevant IPTs are consulted in the stakeholder processes and that there are clear agreements on assessment and mitigation responsibilities. Because of the interaction of different equipment and services, it will also be important to ensure that other IPT stakeholders get early visibility of significant safety issues arising from an individual sub- or supra- system. If this is done, it will be easier to make related design changes to accommodate the issue.

## 4.3 Aligning Safety and Environment

4.3.1 At the present time alignment between safety (through the POSMS) and environment (through the POEMS) is likely to be via conducting combined studies and setting up joint Safety and Environmental Committees, and producing combined Safety and Environmental Cases and Case Reports. The IPT can decide the degree and extent of this aligned or combined approach to be adopted depending on the complexity of the project and the issues that are likely to arise.

4.3.2 In situations where safety and environment are being considered separately it should be ensured that common issues are not overlooked and that the implications of safety measures on environmental performance (and vice versa) are fully considered.

4.3.3 For instance if noise tests are to be undertaken, it makes sense to ensure that the data collected will be suitable for both occupational and environmental exposure

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assessments. By the same token, just because an occupational assessment for noise is being undertaken it should not be assumed, without checking, that the safety work will automatically cover environment as well.

4.3.4 Where occupational and environmental issues have different legislative or policy requirements or threshold limits an IPT may decide to separate the management of environmental and safety issues.

4.3.5 It is also likely that common control or mitigation measures and strategies can be considered, especially where the safety improvement solution involves control at source. Where this proves impracticable or controls are developed separately, the IPT must be careful to ensure that the wider implication of solving a safety (or environmental) issue are considered. It might be entirely sensible and reasonable to deal with the occupational exposure risks of an accidental release in an enclosed space by rapid discharge to air, thereby relying on removal and subsequent dispersion and dilution. However this is likely to give rise to environmental impacts which have to be considered and evaluated.

4.3.6 It will assist IPTs to ensure that they have adequately considered any common issues by cross referencing the results of Hazard Identification under the POSMS and Environmental Features under POEMS.

## **4.4 Showing Conformance**

4.4.1 The POSMS consists of a number of procedures. Within each procedure there are defined objectives and outputs. The procedures also include guidance and tools to help the user produce the desired outputs. The use of this guidance is not mandatory, as long as suitable alternative methodologies are used which achieve the desired objectives and deliverables as defined in the procedure. Therefore, when following the system procedures four options exist to demonstrate conformance:

- Use the recommended guidance and tools contained within the procedure, including allowed variations and options, and document the outcomes.
- Use an equivalent process and tool-set generated elsewhere – document evidence of procedural equivalence along with the outcomes.
- Use a bespoke process and tool-set for the project – document how the bespoke procedure achieves the system/procedure objectives along with the outcomes.
- Where it is possible to omit a procedure, or part of a procedure the basis for the decision must be documented (in the Safety Case) before progressing to the next applicable step or procedure.

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## **4.5 Procurement Strategies**

4.5.1 There are many procurement strategies employed by the MOD. In the majority of cases, where new or enhanced capability is being procured, the POSMS can be applied in its entirety. The only major differences between the strategies being which organisation carries out the system procedures, and which has day to day ownership of the management system through the procurement process.

4.5.2 However, there are specific conditions for UORs where it may not be possible to complete all the steps and procedures of the POSMS in the same time frame as acquiring and deploying the capability. This does not affect the level of Safety performance or assurance which must be achieved, though it may affect the nature of the Safety assurance information available.

## **4.6 Development**

4.6.1 The POSMS has been produced on the basis of a conventional developmental acquisition project, whilst ensuring that the majority of likely variations and procurement strategies can be accommodated. As discussed in previous sections, the POSMS is also aligned with the main phases and stages of the CADMID cycle. Therefore if an IPT is managing a conventional development project, then all procedures and process in the SMS should apply. Any variations that are required are likely to be a result of two factors. First, whether the IPT is using contractors or advisors to support their work, in which case it may be appropriate for the IPT to use these to complete the relevant procedures. Second, whether the equipment or service (and its potential impact) is so straightforward as to warrant the various streamlining options available within the POSMS.

## **4.7 PPP/ PFI**

4.7.1 PPP/PFI projects, including those for Service provision, should meet the same safety standards as if they were developed solely by and for MOD. In these cases it may be appropriate, once a decision has been made to proceed by way of a PPP/PFI solution, to contractually transfer the requirement for conformance with the POSMS to the PPP/PFI contractor, but not responsibility for safety. The IPT (and Safety Committee) should then be able to review and influence the contractor's approach and the system outputs and deliverables.

### **4.7.2 Supplementary Guidance for PPP/PFI Projects**

Please refer to section 4.a (c) below for further information and guidance on PPP/PFI projects

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## **4.8 Collaborative Projects**

4.8.1 International collaborative projects should meet the same levels of safety performance and assurance as if they were developed solely by and for MOD. If a decision is likely that the procurement is to proceed by way of a collaborative solution, then the IPT must make it clear to the partner(s) that MOD will require conformance with the POSMS. The IPT should ensure that the POSMS requirements are contractually transferred to the main or lead contractor. The IPT (and Safety Committee) should then be able to review and approve the partner's and contractor's approach to the POSMS and the system outputs and deliverables.

### 4.8.2 Supplementary Guidance for Multinational Collaborative Projects

Please refer to section 4.a (b) below for further information and guidance on Multinational Collaborative Projects.

## **4.9 COTS, MOTS, and Modified COTS and MOTS**

4.9.1 In these procurement options the basic design of the equipment may be stable and the manufacturer or supplier of the item is likely to have carried out some safety assessment of the item. In all cases, the supplier should be required to demonstrate how the assessments (and hence design decisions already made) map across to the requirements of the POSMS, and hence show conformance with the requirements of the POSMS. The supplier should be required to make good any gaps or shortcomings in information, including the likely effects of any modifications required, as part of acceptance into service. When following these strategies the IPT must still assess the operation or the equipment/item in the operational scenarios set out in the requirement.

## **4.10 Urgent Operational Requirements (UOR)**

4.10.1 Safety management should apply to UORs (Urgent Operational Requirements) as it does for any other type of project. The same levels of safety performance will be required, in that systems must be made tolerably safe and Risks ALARP. However, it is recognised that it may not be possible or practical to apply the full procedural requirements of the management system before UORs come into service. This may affect the nature of the safety assurance information which is available to support Introduction to Service.

4.10.2 The main principles under which the management system will be applied to UORs are:

- As much of the procedural elements of the system are applied as is practical in the given situation.

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- The IPT must document where it has not been practical to apply a particular procedure or part of a procedure and provide justification that the process followed achieves the same objectives (see “Showing Conformance” above).
- The Safety Committee should be used to validate judgements which may replace procedural outputs.
- All reports included in the Safety Case must indicate any limitations as a result of not being able to fully complete a procedure.
- A plan must be developed (as part of the Safety Plan), and included in the Safety Case, which shows how the IPT intends to revisit the Safety Case (typically within 12 months) in order to ‘backfill’ management system requirements.

4.10.3 In some cases this last principle may require little more than the collection and collation of data which may not have been available earlier. In other circumstances, especially for any equipment or service brought into service under an UOR and retained in service, this could mean provision of confirmatory assurance evidence through tests or analysis. The IPT must consider the best approach on a system by system basis, and this should be validated by the Safety Committee.

## **4.11 Legacy Systems**

4.11.1 TLB Policy that pre-dates the issue of the ASEMS should have ensured that retrospective Safety assessments have been conducted on Legacy Systems. The POSMS must now be applied to these acquired items for the remaining stages of their life cycles.

4.11.2 Assistance can be sought from ASEG on conducting “Gap Analysis” on existing SMS arrangements and moving towards full compliance with the requirements of POSMS, in terms of its objectives and deliverables.

4.11.3 Supplementary Guidance – Legacy Systems

Please refer to section 4.a (a) below for further information and guidance on Legacy Systems

## **4.12 Precautionary Principle**

4.12.1 At all times, within the POSMS, IPTs should be applying the precautionary principle to assessments, the evaluation of evidence, and decisions. In practice this means that if there is an absence of information, or if the information

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available is inadequate, then the IPT (or its advisors) must base assessments on worst case assumptions and scenarios. Those assessments form the basis of subsequent actions and decisions, until better or more complete data and information are available and the assessments can be revised or repeated accordingly.

### **4.13 Knowledge Base**

4.13.1 It is important to capture and share experience and information from current projects to benefit both future projects and other current projects dealing with similar issues. The capture of relevant safety data, safety impact assessments, and staff skills will be undertaken via the audit protocols. The management of this information, “the knowledge base”, is co-ordinated by ASEG and the FSMOs, although final decisions have yet to be made on the format and architecture for the knowledge base. The knowledge base sits outside the POSMS but supports it. However, the knowledge base will be available to all IPTs and will eventually provide significant information at the commencement of any new procurement project on the experience gained on other similar projects. The knowledge base is created from information from the audit and checking procedures as well as information provided in the Hazard Logs and for the Safety Case.

### **4.a Supplementary Guidance Documents**

4.a.1.1 Contained in this section are supplementary documents that are designed to provide guidance on establishing and maintaining some of the more technical aspects of POEMS/POSMS.

4.a.1.2 Supplementary Guidance Documents include:

**(a) Legacy Systems**

**(b) Multinational Collaborative Projects**

**(c) PPP/PFI Projects**

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### **(a) Supplementary Guidance for Legacy Systems**

This additional guidance is intended to provide advice on the application of POEMS and POSMS to projects that involve legacy systems.

#### **(a.1) Lack of design data makes it difficult to develop safety and environmental cases for legacy systems.**

Possible Issues:

- Original design information may not be available for legacy systems.
- Justifications for safety and environmental-related assumptions or decisions may not be available.
- Information on hazardous material used in the equipment may not be available.
- The software used in legacy systems may be of unknown pedigree.
- It may not be feasible or easy to implement safety and environmental-related design changes for equipment that is already in service.

Corresponding Advice:

- Use suitably qualified and experienced personnel to undertake a gap analysis and decide what additional information is required to comply with POEMS and POSMS, in particular to produce robust safety and environmental cases. The gap analysis should take into account the life-cycle phases under consideration.
- The gap analysis will inform what further safety and environmental activities are to be undertaken. Retrospective documentation for past life-cycle phases will not be required. For remaining phases, the analysis should investigate whether full assessments are needed. Any decisions to streamline the assessment (and audit and assurance arrangements) should be agreed with key stakeholders and recorded.
- Where key information gaps appear, it may be necessary to undertake safety and environmental studies and analyses to verify that existing operations do not pose unacceptable levels of risk. Be aware that there may be a legal requirement to undertake some studies and analyses e.g. to determine hazardous materials that have been used in the equipment.

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- In order to determine if such safety and environmental analyses will be worthwhile or useful, compare the potential benefits against the cost of undertaking the work.
- Make allowances for such studies and analyses when planning budgets and resources.
- It may be possible to use historical data in safety and environmental justifications. Seek expert advice on the extent to which reliance can be placed on historical data in the safety and environmental cases. In particular, assess whether the historical data is still relevant to the system's current usage and operational environment.
- For safety-related software issues refer to the guidance within Def Stan 00-55. For Software of Unknown Pedigree (SOUP), meeting Def Stan 00-55 evidence requirements can be very expensive. In order to determine if demonstrating Def Stan 00-55 compliance is useful or worthwhile compare the potential benefits (for example in terms of lives saved) against the cost of undertaking the work. Use expert advice where necessary.
- Document important decisions and supporting evidence to produce an audit trail record that will be useful for the future.
- Continue to log in-service incidents and look for trends. Consult with user organisations to identify if operational procedures are being carried out and if they are effective. Revisit the safety and environmental cases as necessary when in-service issues are identified.

**(a.2) Proportional implementation of POEMS and POSMS for In-Service Changes:**

- Mid-Life Updates/Modifications;
- Changes to the Operating Environment;
- Changes to the Legislative Environment.

Possible Issues:

Despite the potential lack of design data, POEMS and POSMS:

- Are to be implemented for all legacy equipment.
- Require safety and environmental cases to be revisited on a regular basis and specifically before:

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- A change in role, e.g. deployment to a different environment;
- A change in the equipment;
- Major investment decisions, including:
  - Mid-life update;
  - Decision to postpone Out of Service Date’
  - Repeat purchase of major equipment.
- Constituent components become obsolete;
- The introduction of major legislative changes.

Corresponding Advice:

- POEMS and POSMS allow for some flexibility of approach. With agreement from appropriate Systems Safety Groups, it is possible to tailor the manner in which POEMS and POSMS are implemented to suit the project under consideration. Gain such agreements with System Safety Groups and apply POEMS/POSMS in a proportional manner, taking into account the size and complexity of the project.
- Consider necessity for in-service safety and environmental assessments if there is only a short in-service period left. Use a screening exercise, a comparison of the potential benefits (for example in terms of lives saved) against the cost of undertaking the work, or refer to system’s accident/incident history to justify the need for assessments, considering issues such as any change in usage patterns prior to the disposal phase. If assessments are not justified, record the reasons.
- Agree with relevant systems safety and environmental groups what further activities would constitute an acceptable level of compliance with POEMS/POSMS, taking into account the residual levels of risk associated with the equipment and its operations:
- For a mid-life update or a major modification it may be appropriate to revisit the whole safety case and environmental case;
- For smaller and simpler modifications, rather than developing a safety and environmental argument anew from first principles, it may be appropriate to focus efforts on ensuring that the modification does not adversely affect the existing safety and environmental cases;

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- Changes to operational usage should trigger a review of the safety and environmental cases. Include planning organisations such as Planning Joint Head Quarters (PJHQ) in the stakeholder engagement process. Ensure they understand their responsibilities and that they inform the IPT before any change of role is undertaken.
- There is scope to request dispensations in order to use equipment outside the safety case defined limitations. Ensure that the process for doing this is clear and that it is understood that this is not an exemption. Details on dispensation processes can be obtained through the relevant safety System Safety groups.
- Seek expert advice on what issues of standards/regulations to apply to the modification. Applying more recent versions of standards/regulations can either be beneficial or result in complications.
- Be aware that legislation that is not retrospectively enforced may apply to modified systems despite not being applicable to the system in its original form.
- For design initiated modifications, ensure that arrangements are in place for the designer to provide sufficient technical information to support the update of the safety and environmental cases.

**(a.3) Keep the Safety and Environmental Legislation Registers Up to Date (SMP 01 and EMP 01)**

Possible Issues:

- There may not be legislation registers or they may be out of date.
- Having up to date registers can de-risk the project significantly as understanding the legislative requirements can ensure relevant risks are identified and mitigated.
- IPTs may not have the skills to complete such a register.

Corresponding Advice:

- Identify if safety and environmental legislation registers:
  - Have already been developed for the project;
  - Are up to date;

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- Provide sufficient information to be useful in managing the project. The register should explain what the actual impact of the legislation on the project is, rather than just listing it.
- Secure sufficient budget and resources to develop and maintain the legislation registers.
- Safety and environmental policy offices, similar projects or the contractor can help in identifying a comprehensive list of applicable legislation.

**(a.4) Dissemination of information (SMP 01, 03 and EMP 01).**

Possible Issues:

- For legacy equipment there is potential to assume that all relevant safety and environmental stakeholders are involved, when this may not be the case.
- Most equipment interfaces with other systems and all equipment has users. If no relevant stakeholders are included from the teams responsible for these systems, there is a risk that the safety and/or environmental risks will be missed.
- Stakeholders may not recognise the importance of their role and may send unqualified people to represent them at meetings. Decisions may therefore be taken by unqualified personnel.
- Instructions may not be clearly disseminated to appropriate people.

Corresponding Advice:

- Be proactive in formally defining and agreeing stakeholders' responsibilities.
- Develop and maintain a formal stakeholder register. For cluster IPTs with numerous small legacy projects, an IPT level stakeholder register may suffice. Ensure that there is sufficient budget and resources to do so. Ensure that stakeholders understand the importance of the role they play in your project.
- Ensure that the planners such as PJHQ are identified as stakeholders and have been informed of their responsibilities.
- Ensure that that experienced users and maintainers are involved in hazard identification and analysis and in environmental risk and impact identification.

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- Safety and environmental management plans should:
- Include the method of dissemination of information (the method may vary depending on the criticality of the safety and environmental information);
- Communicate assumptions, boundaries and interfaces;
- Emphasise the importance of communicating the safety and environmental information to the user;
- State who receives the safety and environmental case, who holds it and who reviews it;
- Ensure there is a feedback loop from the user to ensure they receive and act upon the information.
- Refer to the domain specific Joint Service Publications for additional information.
- Safety and Environmental evidence should be retained until after system disposal (either on hard or electronic copy). There may be legal requirements for the retention of some data, such as health monitoring records. See System Support Procedure 03 for more details.
- Information on any changes initiated by the IPT should be fed through to the end users, and vice versa.

**(a.5) Safety and environmental meetings for legacy systems.**

Possible Issues:

- Safety and environmental panel meetings are required through-life.

Corresponding Advice:

- Ensure that:
  - Stakeholder organisations send suitably qualified and experienced personnel to safety and environmental panel meetings;
  - Ensure military planners such as PJHQ and ECC organisations are aware of panels and attend if planning changes to the equipment;
  - Ensure emerging legislation is an agenda item;
  - Ensure the review of accident/incident occurrence data when available.

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- Agree when to periodically review safety and environmental cases;
- Gain periodic assurance from user organisations that procedural mitigations are being implemented and are effective.

**(a.6) Disposal.**

Possible Issues:

- Developing a disposal plan should be considered as soon as possible in the project. Waiting until it is approaching out of service can incur unnecessary expense.
- The disposal plan should include how obsolescence is to be addressed.
- The IPT needs to be aware of its responsibilities for disposal.

Corresponding Advice:

- Obsolescence can be divided into 2 issues:
  - Obsolescence of main equipment. Produce a plan to show how obsolescence will be addressed.
  - Obsolescence of Spares. Safety and Environmental cases should address component and sub-system change due to obsolescence.

For both issues agree who is responsible for obsolescence management - the IPT or the Contractor.

- Disposal can be divided into 2 areas:
  - Through life disposal. Emergency procedures should be written to cover disposal of equipment lost through accidents, this should also be covered in the risk registers. The IPT needs to understand it's responsibilities for waste disposal (this should be identified in the legislation register). Routine disposal of consumables, items replaced by modifications and mid-life upgrades are also the responsibility of the IPT to dispose of in line with legislative requirements.
  - End of life disposal. Put a plan in place as soon as reasonably practical, identifying how to dispose of equipment and anticipated cost of disposal.

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- If planning to sell equipment, the MOD must understand its legal obligations to provide safety and environmental statements and data for the equipment. The MOD may also have a duty of care as an equipment supplier. These obligations should be captured in the safety and environmental legislation registers.
- Ensure that safety and environmental cases are in place for the disposal process.

### **(b) Supplementary Guidance for Multinational Collaborative Projects**

This additional guidance is intended to provide advice on the application of POEMS and POSMS to multi-national collaborative projects.

#### **(b.1) Safety and environmental delegations and risk management may have some unique issues attached to them (Safety Management Procedure (SMP) 01 and Environmental Management Procedure (EMP) 01).**

##### Possible Issues:

- The respective Letters of Delegation will be the same for Multi-National projects as any other project; however the IPTL may not have sufficient visibility of information to provide the same level of assurance to senior managers as would normally be expected.
- A multi-national board may accept safety and environmental risks that would be classified as intolerable in the UK regime.
- Although other nations may have good regulatory frameworks, their requirements and expectations may be different to those of the UK.
- The ALARP principle may be unknown or interpreted differently by other nations.
- Other nation's may define and classify hazards/risks in a different manner to the UK.
- Other nations' regulatory frameworks may lead to decisions based on different criteria.

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Corresponding Advice:

- Identify up front the information required to produce robust safety and environmental cases. This includes the information necessary to comply with:
  - UK legislative and regulatory requirements;
  - MOD Policy and Certification requirements;
  - Civil or MOD Standards;
  - Safety and environmental targets;
  - Tolerability criteria; and
  - The defined risk management methodology.

Safety and environmental information requirements can also be derived from initial assessments of the capability or concept being developed.

- Where possible ensure safety and environmental information requirements are captured as deliverables in the contract:
  - Be as specific as possible about what information is required to support safety and environmental cases;
  - Be specific about the format of the required information;
  - Be specific about the benefits to the project through the provision of this information.
- Identify any lack of visibility of required information as soon as possible and consult with/inform appropriate policy and senior stakeholders. Develop and implement safety and environmental management programmes of work to address the resultant risks.
- Ensure that there is a clear audit trail for all decisions made, especially when they are at odds with UK policy.
- Do not always take data received at face value. Information provided should be checked and verified. IPT desk officers need:
  - To understand and be well informed about safety and environmental issues;

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- To be able to report on the quality of the delivered documents;
- To understand how their decisions can have safety and environmental impacts; and,
- To understand when to seek expert advice.
- Explain the benefits and importance of the ALARP principle to partner nations. Assess differences in approach between UK and other nations' ALARP judgements. Request or provide further risk analyses, assessments and mitigations if required.
- Review the results of hazard identification activities and risk classification matrices against UK tolerability criteria. If necessary, ask for further hazards to be considered and provide further risk mitigation.
- IPT staff should be ready to make the case for the benefits of using the UK approach, where this is more rigorous.

**(b.2) Variations in Stakeholder's Approaches to Safety and Environmental Management (SMP 03 and EMP 04).**

Possible Issues:

- Partner nations may be happy to accept varying levels of risk and there may be a political dimension to decisions taken.
- Commercial and finance personnel may not fully appreciate the importance of safety and environmental issues.
- Equipment capability and military planning organisations may have a different perception of what is a tolerable level of risk than the IPT.

Corresponding Advice:

- To de-risk a project satisfactorily the IPT needs:
  - Desk officers with suitable qualifications and experience;
  - IPTL support and championing;
  - Sufficient resources set aside for safety and environmental activities;
  - To be able to explain the benefits of the UK's thorough approach to safety and environmental management to other nations;

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- A comprehensive audit trail and scrutiny of all information supplied and decisions made.
- Involve commercial and finance officers as key stakeholders. Ensure they understand the benefits of good safety and environmental management.
- Ensure that the audit regime for the contract is clear and concise, and gives access to the necessary information.

**(b.3) There will be many complex interactions between stakeholders (SMP 01 and EMP 01).**

Possible Issues:

- The IPT may find it difficult to identify international stakeholders. If they can be identified, there may still be difficulties obtaining the necessary information and input.
- There may be language barriers particularly with different user communities (in particular feedback occurrence/incident reports from other nations’ operators and maintainers).
- International committees may take longer to reach decisions than single-nation IPTs.

Corresponding Advice:

- Be proactive in stakeholder management. Define stakeholders’ roles and responsibilities up front. Ensure they understand these responsibilities and agree to take ownership.
- Consider the need for using a translator when required.
- Allow sufficient time in safety and environmental management plans and programmes of work to gain international agreement on issues.

**(b.4) An up to date Legislation Register ensures key risks are identified (SMP 01 and EMP01).**

Possible Issues:

- The International Project Office may opt to specify non-UK legislation in safety and environmental contractual requirements.

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- Different nations and contractors may have different interpretations of legislation and what constitutes an acceptable means of compliance.
- The UK may use the equipment in a different manner to other nations and therefore the UK safety, environmental and certification requirements may not be fulfilled by the contract.
- Whilst other nations may specify robust regulatory requirements, discrepancies may exist in the extent to which they ensure compliance with these regulations.
- Other nation’s legislation/policy requirements may not be as comprehensive as the UK. For example other nation’s may not require:
  - Independent safety and environmental audits;
  - Assessment of contractor’s competency;
  - Safety and environmental issues associated with disposal to be addressed during the procurement;
  - The production of safety and environmental cases;
  - The implementation of a Failure reporting and Corrective Action System (FRACAS).
- Overseas contractors may lack understanding of UK safety and environmental requirements.
- Variations may exist between nations on the extent of reliance on military exemptions from safety and environmental legislation.
- Whilst compliance with certain international health and safety and environmental legislation will mean that less hazardous materials are used in a system, such materials may be less functionally effective and therefore in turn lead to derived safety and environmental risks.

Corresponding Advice:

- Consult with the relevant System Safety Groups to identify key legislative requirements and work with other nations to influence their inclusion in the contract.
- Review non-UK legislation to judge its equivalence and check if it gives rise to unacceptable constraints or risks. Provide risk mitigation if needed.

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Seek expert advice where appropriate. The IPT should note that recommendations from independent bodies can add weight to the UK position and therefore sway the other partner nations and contractors.

- Set aside time and resources to agree a common interpretation of existing and emergent legislation and associated acceptable means of compliance both before contract award and through-out the project life cycle.
- If it is not possible to persuade the international collaborative project office to meet all of the UK's safety and environmental requirements, it may be necessary set aside time and resources to undertake extra UK-specific safety and environmental work, such as:
  - Independent safety audits;
  - Assessing the contractor's competency;
  - Ensuring that issues associated with disposal are addressed during the procurement;
  - Reviewing the impacts of differences between UK and non-UK legislative requirements;
  - Implementing of FRACAS;
  - Certification submissions.
- Implement a methodology to ensure that contractors inform the IPT when they change their design to meet emerging legislative requirements. When they do so consider the need to review the safety and environmental cases as required.

**(b.5) The IPT may have little control over the technical and commercial aspects of the contract (SMP 10 and EMP 06).**

Possible Issues:

- As multi-national contracts are negotiated by the international project office, the IPT may have limited opportunities to influence the contract.
- The IPT may have limited opportunities to influence the Terms and Conditions of the Contract and/or ensure they are flowed down to Sub-Contractors.

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- It may not be possible to use standard MOD contract terms and DEFCONs in international contracts.
- The IPT may be required to use a company who does not have a good track record for Safety and Environmental work.
- As the contract communication chain may be complicated, the IPTL may not be certain he/she will obtain sufficient information to discharge his/her responsibilities.

Corresponding Advice:

- Ensure that commercial officers understand the importance of including clauses to enable the IPTL to carry out his/her delegated safety and environmental responsibilities. This should include a requirement to flow clauses down to all Sub-Contractors.
- Influence the international collaborative project office to give due consideration to safety and environmental management track record during bid assessments. Where this is not possible, mitigate the risk through continual oversight and competent and proactive review of the contractor's safety and environmental work.
- Identify up front the information required to produce robust safety and environmental cases. Where possible ensure these information requirements are captured as deliverables in the contract.
- Identify, assess and manage the risks due to the inability to obtain the specific data. Risks that present a significant business impact should also be escalated up the delegation line. Where directed to do so, request and document decisions from higher management.
- Keep a clear record of decisions, identify where they deviate from UK policy.

**(b.6) Disposal (SMP 03, 13 and EMP 06, 07)**

Possible Issues:

- There may be difficulties where the project spans the implementation of new disposal legislation.
- Lack of visibility of design information can lead to difficulties for the IPTL in:

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- Ensuring compliance with disposal requirements;
- Discharging safety and environmental responsibilities if selling the equipment on to a third party.

Corresponding Advice:

- Produce a comprehensive disposal plan at an early stage of the project. Use and maintain it to ensure that any relevant issues are taken into account when negotiating the original contract.
- Assume that the UK will have to dispose of its equipment and ensure sufficient funds to do so are in place. These funds should also allow for changes in disposal legislation. To do so it will be necessary to:
  - Maintain safety and environmental legislation registers;
  - Update and maintain the disposal plan.
- If planning to sell equipment, the MOD must understand its legal obligations to provide safety and environmental statements and data for the equipment. The MOD may also have a duty of care as an equipment supplier. These obligations should be captured in the safety and environmental legislation registers.
- If selling the equipment onto provide clear limitations on how the equipment is to be used.

**(c) Supplementary Guidance for Public Private Partnerships and Private Finance Initiative projects**

Public Private Partnerships (PPPs) are partnerships that bring together, for mutual benefit, a public body and a private company in a long-term joint venture for the delivery of high quality public services. PPPs cover a wide range of different types of contractual and collaborative partnerships including Private Finance Initiative (PFI) projects. A PFI project is a project that involves the public sector contracting to purchase quality services with defined outputs, from the private sector on a long term (typically 25 years) basis, and including maintaining and constructing the necessary infrastructure so as to take advantage of the private sector management skills and incentives by having private finance at risk.

Potential differences in areas such as the balance of shared MOD/contractor safety and environmental responsibilities, contracting methods, information flow and the use of civilian staff in the military environment requires the intelligent application of POSMS and POEMS to PPP and PFI Projects.

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There are different types of PPP and PFI projects, each with the potential for different permutations of:

- MOD/Contractor equipment and facility ownership; and
- MOD/Contractor interaction in providing the service.

As such, it is not possible to apply a common prescriptive process to ensure the appropriate safety and environmental management of PPP and PFI projects. This additional guidance aims to provide advice in applying POSMS and POEMS to PFI and PPP Projects.

**(c.1) Safety and Environmental Responsibilities May Hinder a Total ‘Hands Off’ Output Specification Approach (SMP 01 and EMP 01)**

Possible Issues:

In many instances with PPP and PFI contracts, the IPTL will be aiming to contract for a service based upon an output specification and not define the way in which the Service Provider will achieve the outputs. Such an approach allows the Service Provider room for innovation and freedom in fulfilling the contract. However, there is potential that safety and environmental regulations can constrain this approach. Depending on the project circumstances, the IPTL is or can be:

- The representative of the organisation who instigated the work; and/or,
- An ‘intelligent customer’.

As the IPTL will retain overall responsibility for safety and environmental performance, he/she will need to be sufficiently involved with, and informed of, the Service Provider’s competence, procedures and practices to satisfy him/herself that all the safety and environmental issues associated with the project are being adequately addressed.

Corresponding Advice:

The IPTL is to establish as early as possible his/her safety and environmental management responsibilities and what actions are to be taken in order to discharge these responsibilities. It is recommended that:

- The IPTL consults with appropriate System Safety Groups, regulators, and legal advisors in order to establish:
  - The IPTL’s safety and environmental management roles and responsibilities;

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- The extent to which the IPTL can transfer safety and environmental activities to the Service Provider. Whilst ownership of safety and environmental risks should be transferred to other parties best placed to address them (such as the Service Provider), overall responsibility will still reside with the IPTL. Even if direct risk can be transferred, the consequent reputational risk from an incident will remain with the IPTL, and may be influenced by public perceptions of PPP/PFI projects and private sector priorities;
- If the risk owner has the correct skill set to hold any delegated authority;
- The extent of assurance activities that an IPTL has to undertake in order to discharge his/her responsibilities. Here, over and above meeting any legal requirements, the IPTL should consider a risk based approach where oversight and assurance activities focus on those aspects of the service provision that pose the greatest safety and environmental risks;
- The division of safety and environmental work, obligations and authority between the IPT and the contractor, on issues such as:
  - Holding and updating the safety and environmental case documentation;
  - Authority to make ALARP decisions for hazards of different risk levels;
  - Obligations under environmental Duty of Care legislation regarding waste;
  - Planning for and undertaking continual review of the effectiveness of operational controls.
- Decisions are formally recorded and reflected in the IPT Safety and Environmental Case Reports, Strategies and Plans.

**(c.2) Interaction of Civilian and Military Equipment, Personnel, Procedures and Facilities will be complex (SMP 01 and EMP 01).**

Possible Issues:

PPP/PFI Service Provision Contracts can involve:

- The interaction of civilian and military equipment, personnel, procedures and facilities;

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- Contractor personnel undertaking activities that were once undertaken by MOD personnel;
- Activities that are undertaken under a mix of military and civil regulatory regimes.

Corresponding Advice:

- Define and document the detailed boundaries between civil and military operations and manage the interfaces between the two.
- Do not underestimate the effort and resources required to define the interfaces between the contractor and the MOD. The overarching interface between the stakeholders is to be recorded in the project safety and environmental management systems.
- Potential safety and environmental risks may be reduced if interface issues can be addressed early in the project life, for example via Customer Supplier Agreements (CSAs), Service Level Agreements (SLAs) and Internal Business Agreements (IBAs).
- Engage early with Defence Estates (DE). Failure to do so may result in breach of environmental-related planning law.
- The hazard assessment process should give consideration to the safety risks that result from civilians working in a military environment.
- Ensure that the IPT and the contractor thoroughly understand all aspects of the service to be provided and the environment in which it is to be provided. Be wary of contractor over-optimism in taking on responsibilities that they are not able to discharge. Ownership of risks should be transferred to the organisation best-placed to address them; however, the IPTL will retain overall responsibility for safety and environmental performance.
- It is good practice to allow bidding contractors access to relevant MOD stakeholders to ensure that they have good understanding of what they are being asked to do. However, it is important that the IPT manages and controls the communication of information between the contractors and other MOD stakeholders. During a tender process, MOD must ensure that the same information is given to all potential bidders.
- Do not assume that MOD exemptions will apply to contractors undertaking activities. MOD exemptions apply only to MOD staff and organisations; they do not apply to contractors.

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- The draft contractual requirements should be informed by safety and environmental assessments and reviewed by all appropriate stakeholders and against other stakeholder requirements as defined in the interface management documents to ensure coherency and consistency.
- At some point in the project life cycle, the immediate responsibility for managing the use of the equipment and services may transfer to the front line command chain of command. Include front line commands in an up-front stakeholder engagement process, and in particular ensure that they are involved in the hazard identification and analysis and in the environmental and risk assessment process to ensure that mitigations are actually achievable on the ground.
- Ensure that IPT and Contractor Safety and Environmental Management Systems agree and document how other line of command issues are to be addressed, such as:
  - How civilians are to respond to orders from military personnel, especially if the order is to operate equipment outside the safety and environmental case limitations or if emergency procedures rely on execution of commands;
  - How military personnel are to work under civilian instruction;
  - Who has overall jurisdiction/liability/responsibility for the activities.

Note that legal health and safety obligations between the employee and the employer will continue to be applicable.

**(c.3) The Contract Must Include Safety and Environmental Requirements to De-Risk the Project (SMP 10 and EMP 06).**

Possible Issues:

- Some PPP/PFI and Provision of Service Contracts can extend over a lengthy period. Requisite standards of safety and environmental management have to be established and maintained.
- It is unlikely that necessary safety/environmental activities or information requirements omitted from the original contract will be undertaken or satisfied at no extra cost to the IPT.
- Variations to contract post-award can be disproportionately expensive. It is much better to plan ahead to ensure that the contract adequately covers all assessment, management and assurance obligations.

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- The contractor may employ various levels of sub-contractor who may or may not conform to the prime contractor's required standards.

Corresponding Advice:

- Any potential contractor can be asked to demonstrate their performance in EMS and SMS by completing a Pre-Qualification Questionnaire (PQQ). It is also considered good practice to perform a PQQ for single source contracts.
- It is important that the IPT has clearly identified the Safety risks and Environmental impacts/risks at an early stage to ensure they understand the extent of management and assurance they will require from a potential contractor.
- Any contract should clearly stipulate exactly what is required but not how the contractor should produce it. The IPT may contract for the production of an EMS and SMS or simply the required components in order to produce their own. However, the contract may include provisions for the MOD to agree/endorse contractors' plans as to how particular activities are to be undertaken.
- ISO14001 is a recognised standard for environmental management of an organisation. However, it does not necessarily provide assurance that environmental risks are being well managed. Placing ISO14001 requirements on a contractor will not go as far as satisfying the IPT's obligations under POEMS. ISO14001 should not be used as a general requirement on contractors without suitable consideration of the implications, shortcomings and supplementary provisions necessary.
- For projects that involve new acquisitions made by the contractor, put in place a mechanism to ensure a consistent flow down of contractual and sub-contractual requirements such that they adequately and comprehensively reflect the IPT, contractor and sub-contractor safety and environmental obligations.
- The contract should include a requirement stipulating the level of safety performance to be achieved.
- Ensure that correct sub-contractual arrangements are set in place and in particular that appropriate safety and environmental contract clauses and requirements are flowed down to sub-contractors. Where possible encourage the prime contractor to use Def Stan 00-56 in sub-contracts.
- Ensure suitably qualified and experienced personnel review draft safety and environmental contract clauses.

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**(c.4) The Contract Must Include Safety and Environmental Requirements (continued) (SMP 10 and EMP 06).**

Possible Issues:

- IPTL will have through-life safety and environmental responsibilities.

Corresponding Advice:

- Continual Review Arrangements: - it is recommended that the contract allows for review of the effectiveness of operational controls early after the contract is placed or in the service provision and, if necessary, the implementation of remedial changes. Revised safety and environmental assumptions or operational changes (like using equipment in a different operational theatre to that originally intended etc.) should trigger review of operational controls.
- To ensure the provision and transparency of contractors' processes, the IPT should consider including contract clauses to giving them the right to see any information (including inspection and audit of activities) deemed necessary to satisfy the IPTL that his/her safety and environmental responsibilities are being satisfied.
- The review mechanism defined in a contract depends largely on the nature of the project itself. MOD has mandatory safety and environmental reporting procedures. Requirements for safety and environmental committee meetings should ensure review of safety hazards and environmental impacts/risks.
- Ensure that the contract allows for IPT access to the contractor and sub-contractor facilities and records for audit purposes.
- Ensure that the contract comprehensively captures all necessary safety/environmental activities or information requirements, such as:
  - The safety and environmental activities to be undertaken by the contractor;
  - Information to be delivered in the correct format and in a timely manner to other stakeholders who have safety or environmental management and assurance responsibilities;
  - Access to contractor documents and facilities for audits and reviews.

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## **5 POSMS PROCESS MAPS**

### **5.1 Purpose**

- 5.1.1 The following Process Maps are intended to show the Safety Management activities that would typically be conducted during an MOD project that follows the CADMID cycle. The Maps are a set of interconnected diagrams that permit readers to appreciate the necessary activities, their inter-relationships and links with other events during a project.
- 5.1.2 Activities are described briefly in “Activity Boxes” which are connected in series or parallel by link lines. Some of the activities are themselves processes involving several subsidiary activities and these may be shown on “Child” diagrams. The Process Maps are therefore hierarchical, with different numbers of levels in different areas. Where an Activity Box is supported by a procedure, clicking on the box will call up that procedure. However, not all Activity Boxes are supported in this way. Additional guidance will be provided as ASEMS develops.
- 5.1.3 The diagrams also represent decision points where the choice of subsequent activities is dependent on the answer to a question.
- 5.1.4 The Process Maps contain “feedback loops” where link lines join back to a previous activity. This shows where activities are expected to be repeated or refined with new information. In a process as deeply iterative as Safety Management, it is not possible to show all the possible places in which repetition or refinement may be necessary, and any attempt would lead to overcomplicated diagrams.

### **5.2 Active Process Maps**

- 5.2.1 Process Maps are perhaps most helpful where they enable people to use the information in an interactive way. The user is then able to navigate around all levels of the complete Process Map and, importantly, can use hyperlinks to move from particular places on the diagrams to access related information such as a procedure or relevant tool. In the paper and \*.pdf versions of the manual, the Process Maps are naturally inactive, but the full functionality is available by using the html versions to be found at the ASEMS home page or on CD-ROM versions.
- 5.2.2 Hyperlinks are shown by the cursor changing to a pointing hand and used by clicking with the mouse. Child diagrams are viewed by clicking with the mouse somewhere within the parent activity box.
- 5.2.3 The html version of the Process Maps has six icons at the top centre of each screen which permit the user to (reading icons from left to right):

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- Show/hide the tree structure of the Process Maps (this structure gives an alternative way of navigating around the hierarchy of the diagrams);Go to the home page;
- Go up one level;
- Zoom out;
- Zoom in;
- Print the current screen.

5.2.4 Along the top of every diagram are tabs similar to those on file dividers in a cabinet. These have hyperlinks that allow the user to move to the top diagram for any of the CADMID phases. The title of the current diagram is shown in the middle of the coloured tab, which represents the CADMID phase being looked at currently.

### **5.3 Format and Conventions**

5.3.1 The following conventions have been used on the Process Maps for POSMS and POEMS:

- The top level, immediately below the “Safety Through Life” home page, shows the CADMID phases and milestones between them. The Demonstration and Manufacture phases have been combined;
- Activity boxes are rectangular;
- Decision boxes are diamond shaped, containing the text of the question or decision and two or more paths out of the box that are labelled with answers to the question (eg a YES path and a NO path);
- The milestones are also shown as diamond shaped but are coloured red. The milestones are identified with an abbreviation with a key at the bottom of the CADMID top level diagram;
- Parent activities are shown with a shadow behind them and with an information symbol in the top right hand corner;
- Hyperlinks are shown with text in blue. Procedures linked to particular activity boxes are shown by reference number in a separate area at the bottom of the box;
- Some activity boxes have large arrows in the bottom left. These are hyperlinked back to a previous diagram (for instance when it is necessary to go back to Hazard Identification and Analysis for a mid-life update);
- Activities that are not always relevant are shown with lighter shading and text at the bottom that defines their relevance (eg OME Projects only) or is

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“where necessary”. For these activities, the IPT should consider whether the activity is applicable to their project, seeking guidance if they are not certain;

- Activities which are continuous or periodic are shown at the top of the diagram (CADMID phases level only). Each of these continuous activities has a reference number shown immediately after the description. The diagrams show when each of these activities is expected to start relative to the other activities, but they all continue from that point until project closure;
- Where an activity uses an input from one of the continuous activities (eg the Safety Plan), then this is shown by using the reference number in a separate area at the top of the box.


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## Welcome to the UK MoD Project-Oriented Safety Management System Processes

Provide Capability with Tolerable Safety Through Life 

-  Concept Phase
-  Assessment Phase
-  Demonstration & Manufacture Phase
-  In-service Phase
-  Disposal Phase

-  POSMS Manual
-  ASEMS Homepage



Concept Phase

Assessment Phase

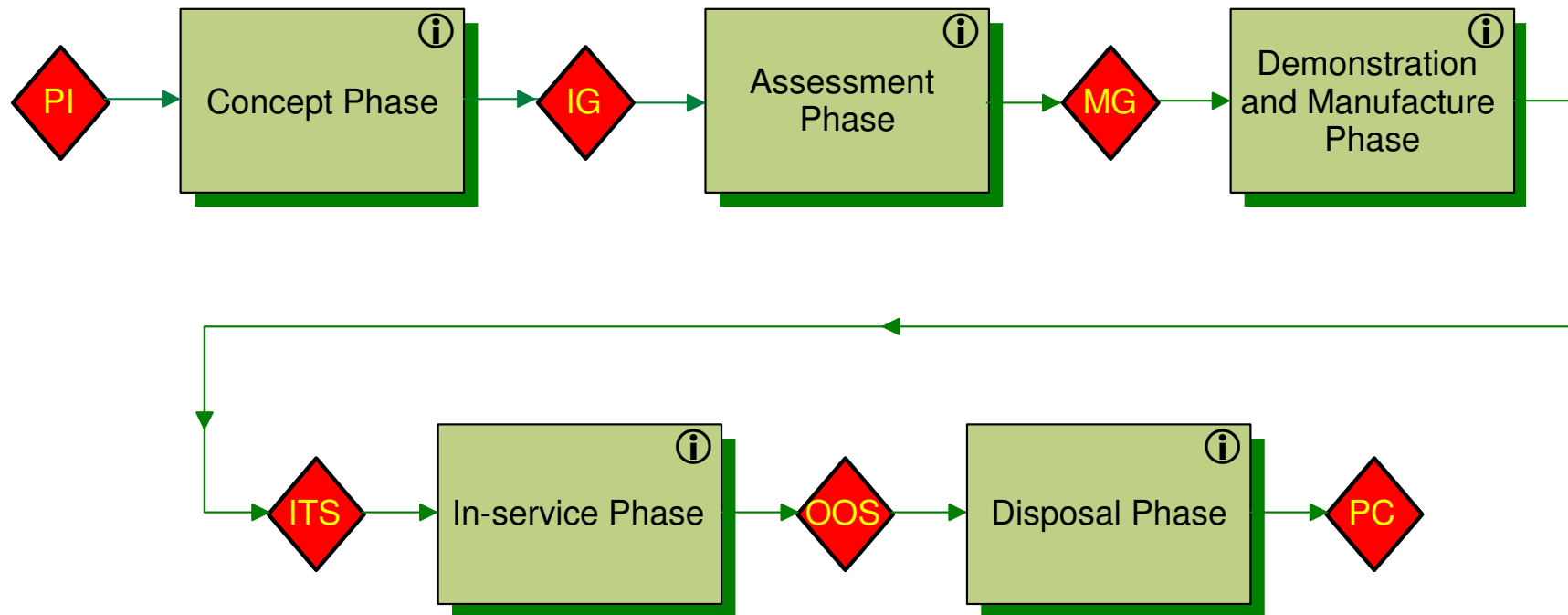
Demonstration & Manufacture Phase

In-service Phase

Disposal Phase

Provide Capability with Tolerable Safety Through Life

## Provide Capability with Tolerable Safety Through Life



PI = Project Initiation

IG = Initial Gate

MG = Main Gate

ITS = Introduction to Service

OOS = Out of Service

PC = Project Closure

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Level 1.1

Concept Phase

Concept Phase

Assessment Phase

Demonstration & Manufacture Phase

In-service Phase

Disposal Phase

Concept Phase

SMS Audit (1)

• Safety Committee (2)

Provide Safety Information For Stakeholders (3)

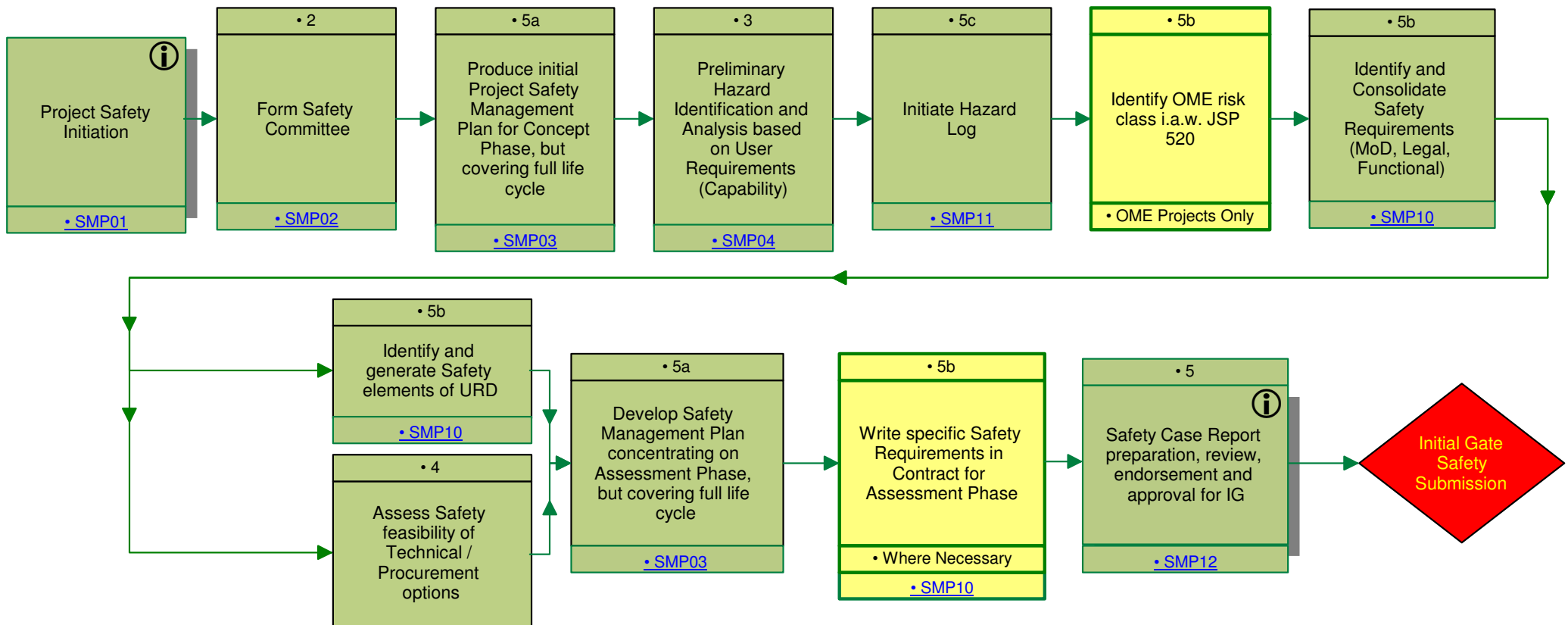
Communicate project risks to project risk management (4)

• SAFETY CASE (5)

Safety Management Plan (5a)

Register of Legislation & Other Significant Requirements (5b)

Hazard Log (5c)



Concept Phase

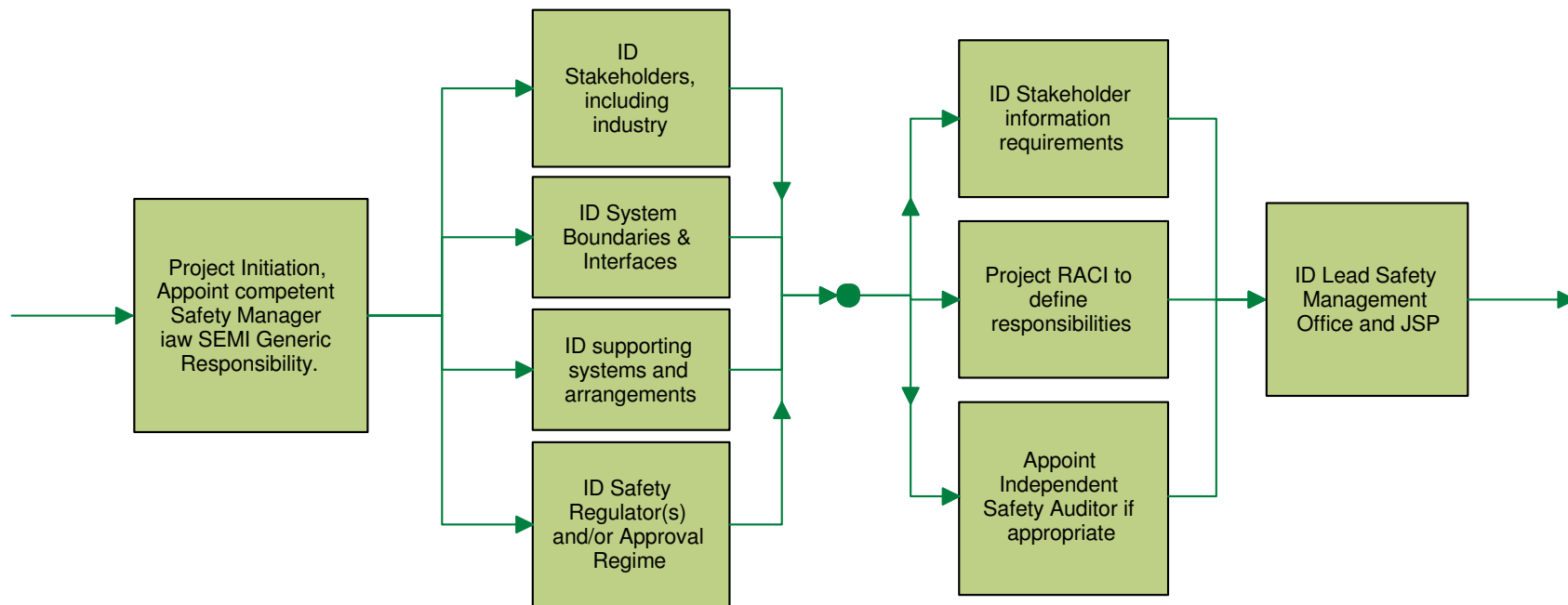
Assessment Phase

Demonstration & Manufacture Phase

In-service Phase

Disposal Phase

Project Safety Initiation



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Level 1.1 - B Safety Case Report preparation, review, endorsement and approval for IG  
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Concept Phase

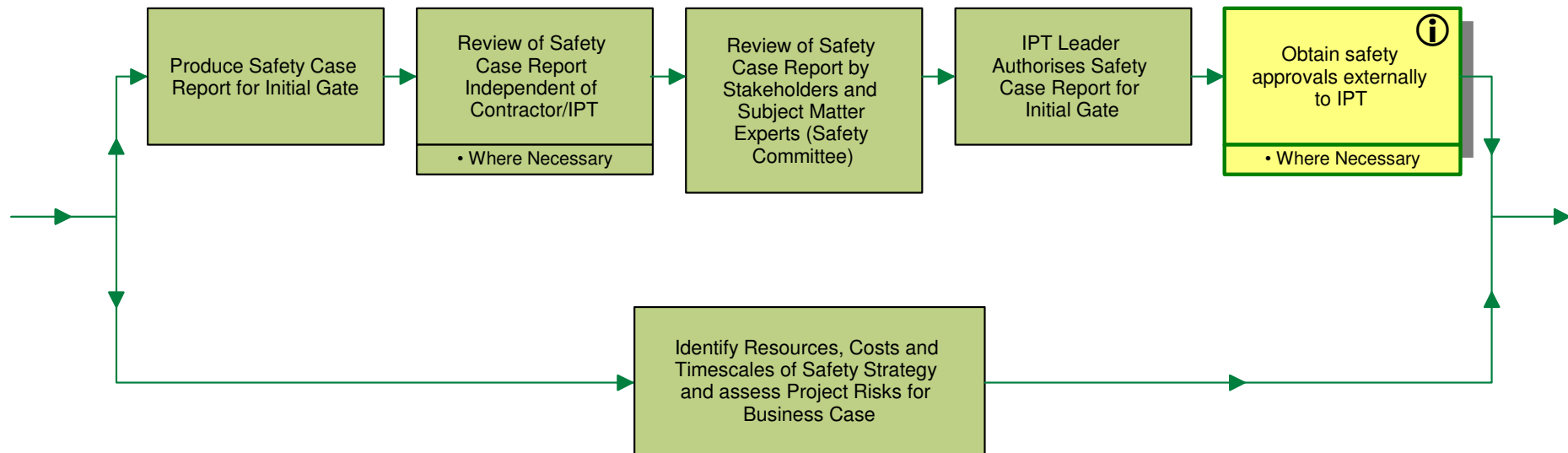
Assessment Phase

Demonstration & Manufacture Phase

In-service Phase

Disposal Phase

Safety Case Report preparation, review, endorsement and approval for IG



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Level 1 1 - B1

Obtain safety approvals externally to IPT

Concept Phase

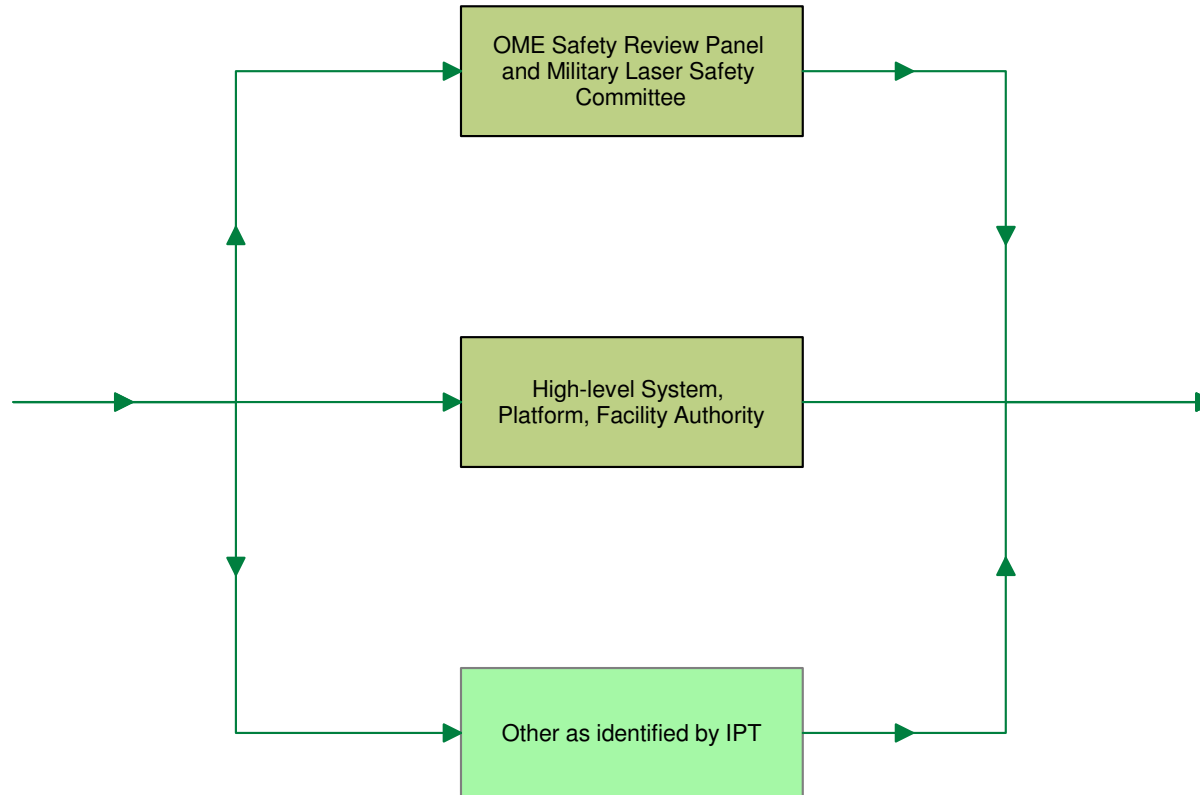
Assessment Phase

Demonstration & Manufacture Phase

In-service Phase

Disposal Phase

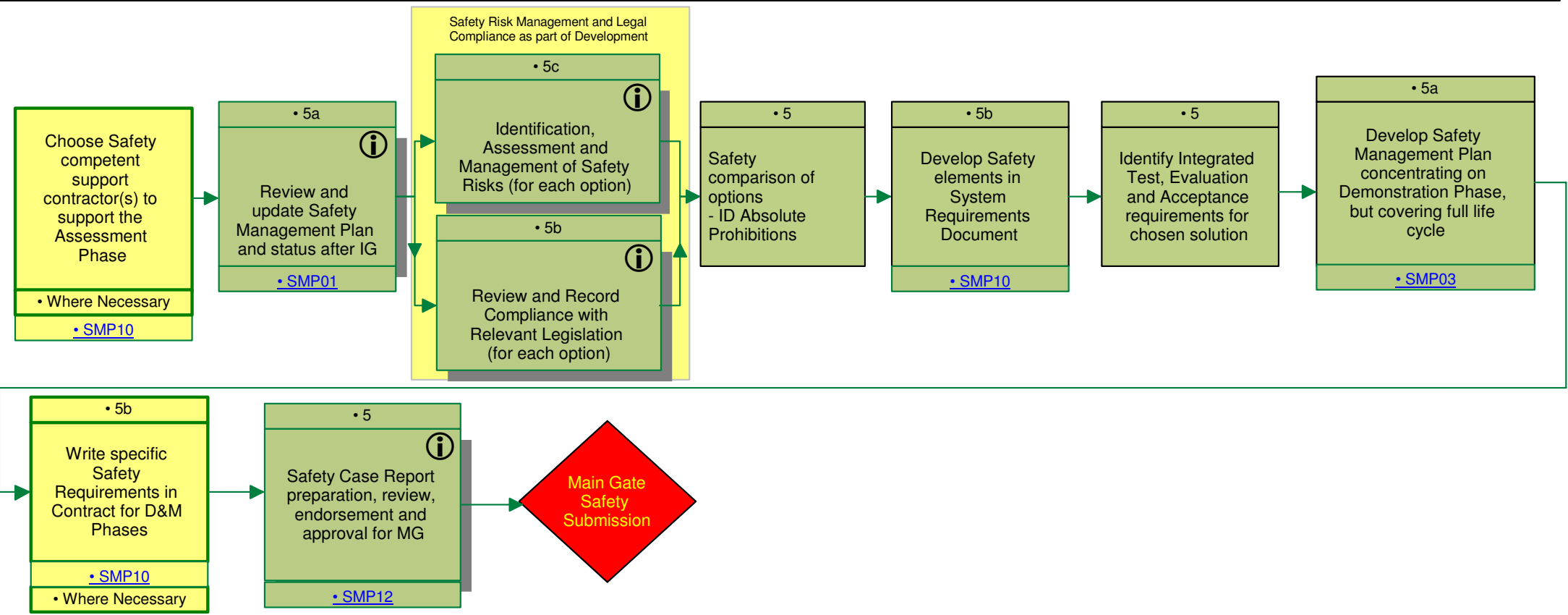
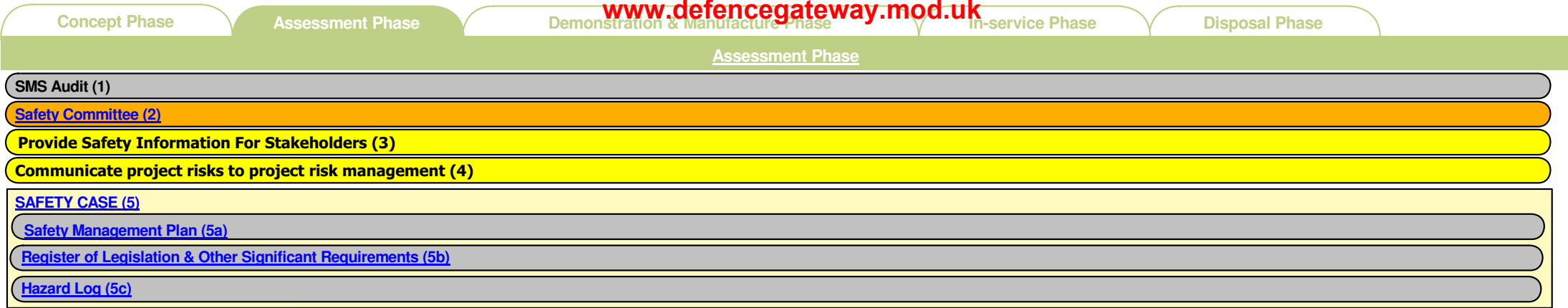
Obtain safety approvals externally to IPT



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Level 1.2

Assessment Phase



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Level 1.2 - B

Review and update Safety Management Plan and status after IG

Concept Phase

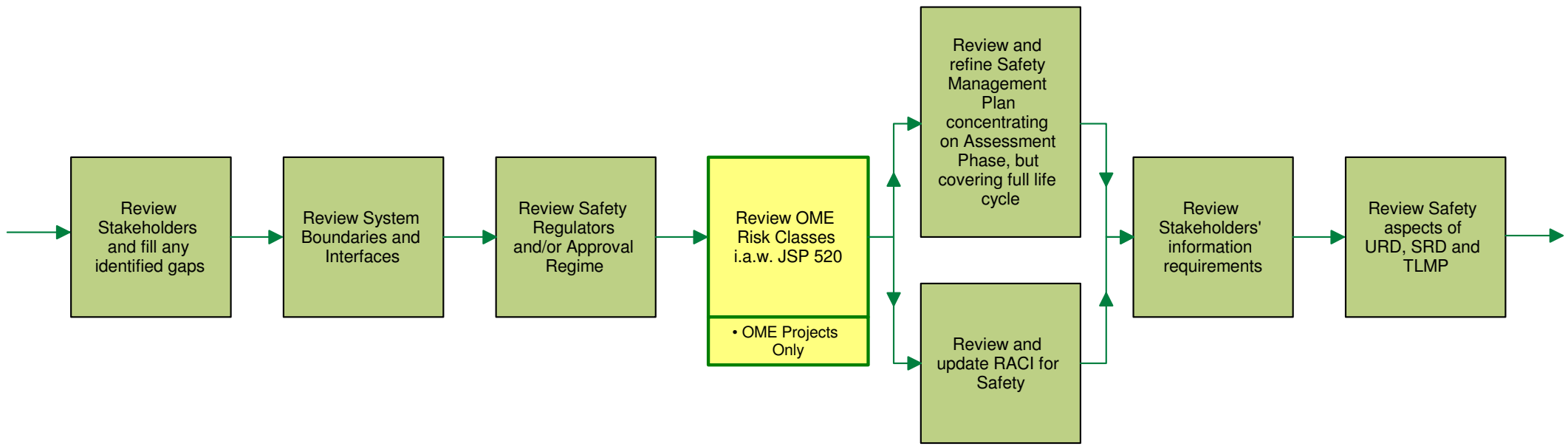
Assessment Phase

Demonstration & Manufacture Phase

In-service Phase

Disposal Phase

Review and update Safety Management Plan and status after IG





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Concept Phase

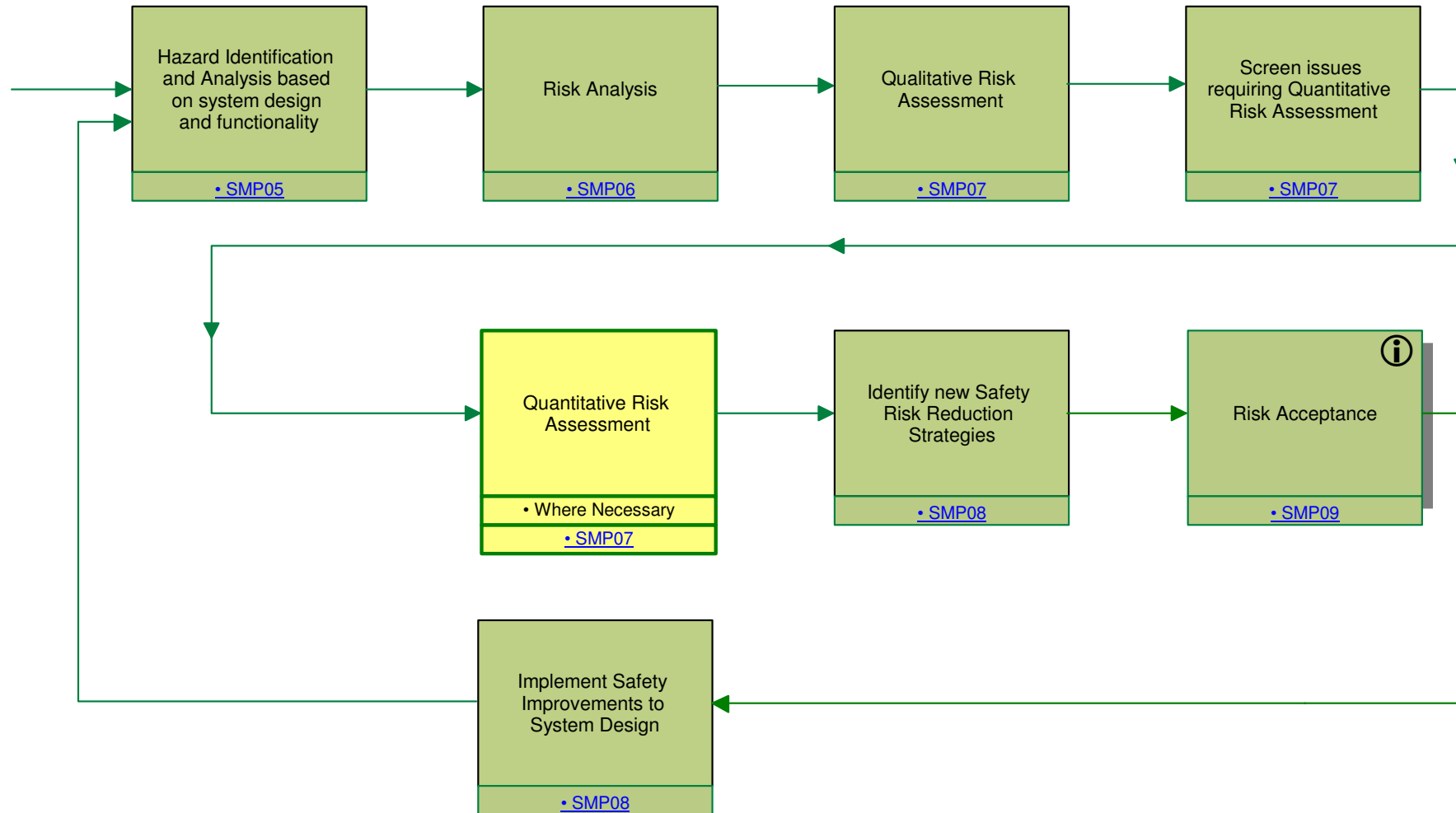
Assessment Phase

Demonstration & Manufacture Phase

In-service Phase

Disposal Phase

Identification, Assessment and Management of Safety Risks (for each option)



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Level 1.2 - A1

Risk Acceptance

Concept Phase

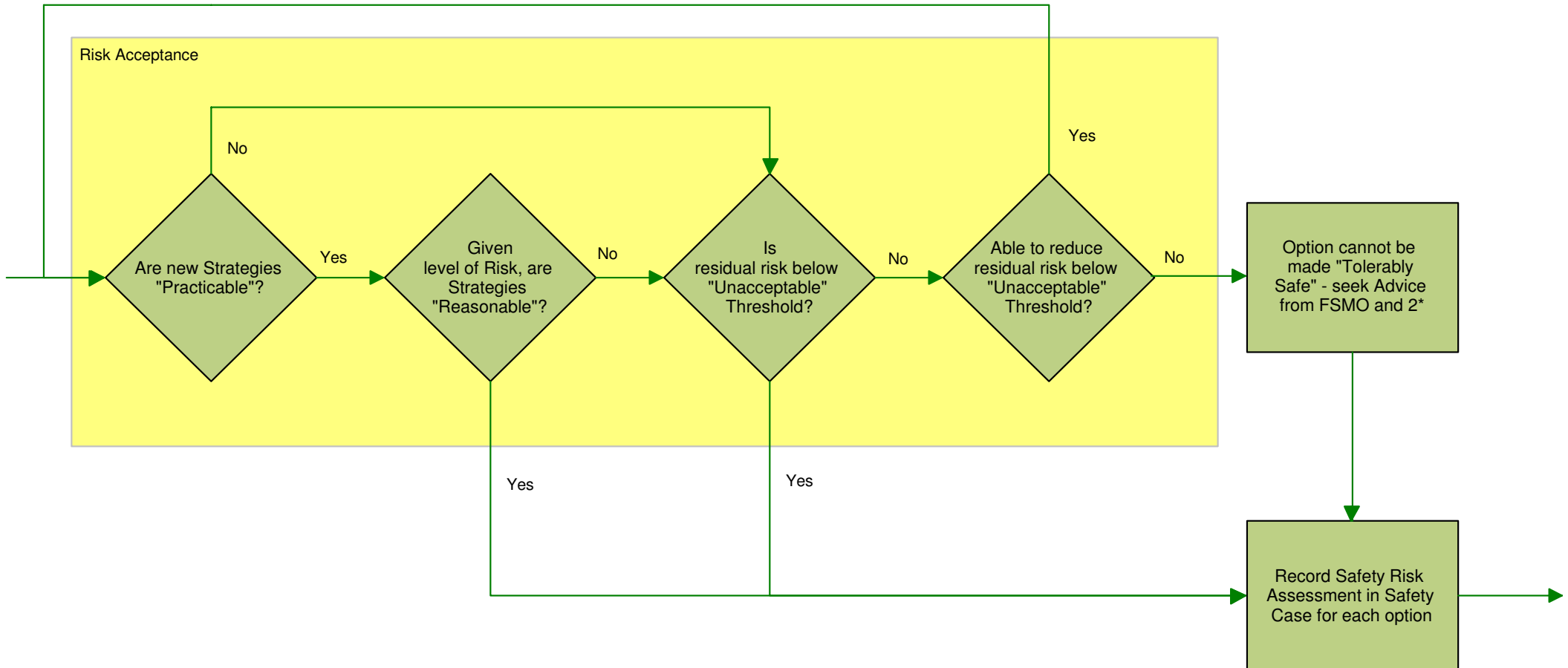
Assessment Phase

Demonstration & Manufacture Phase

In-service Phase

Disposal Phase

Risk Acceptance



Concept Phase

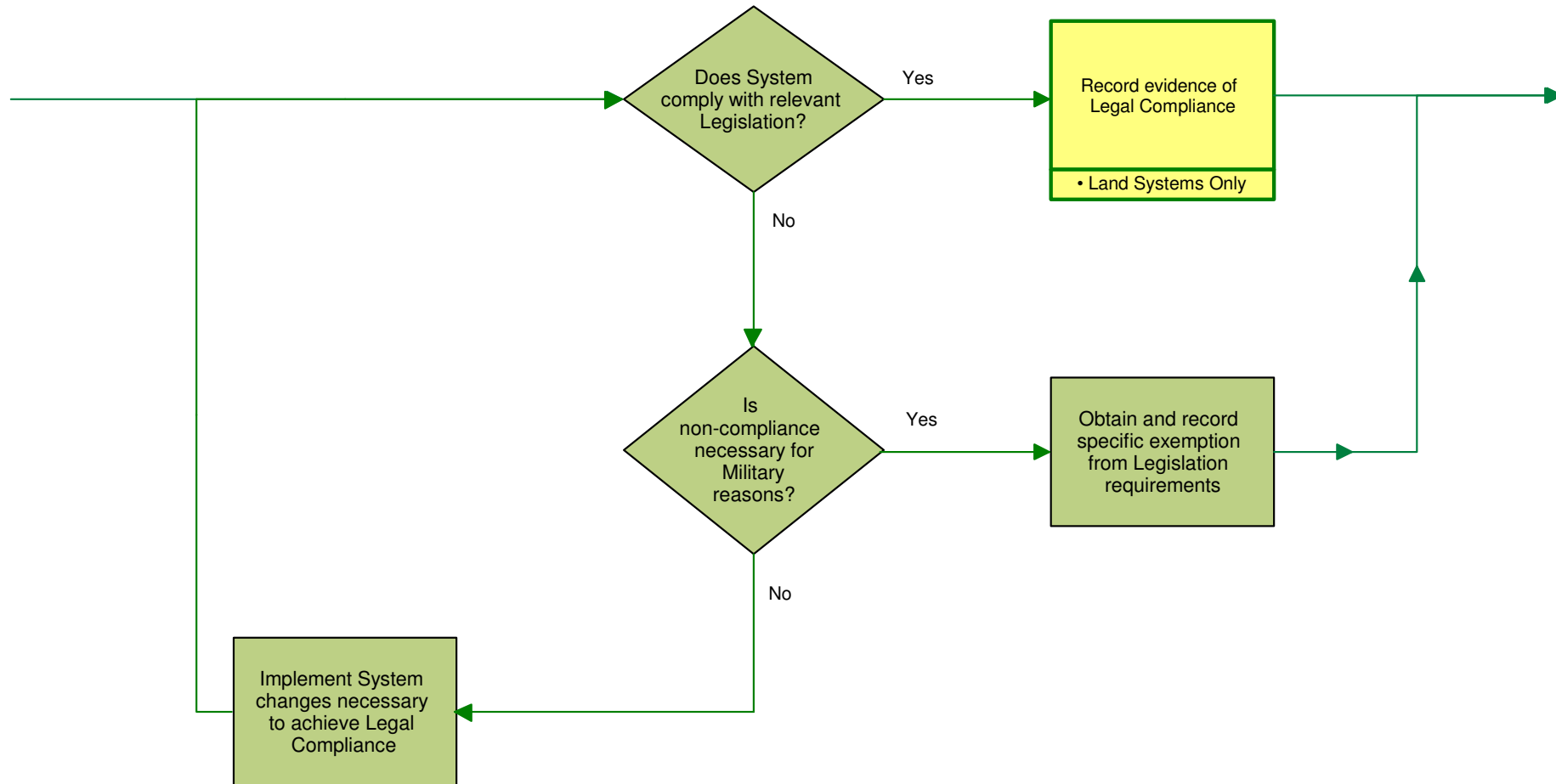
Assessment Phase

Demonstration & Manufacture Phase

In-service Phase

Disposal Phase

Review and Record Compliance with Relevant Legislation (for each option)



Concept Phase

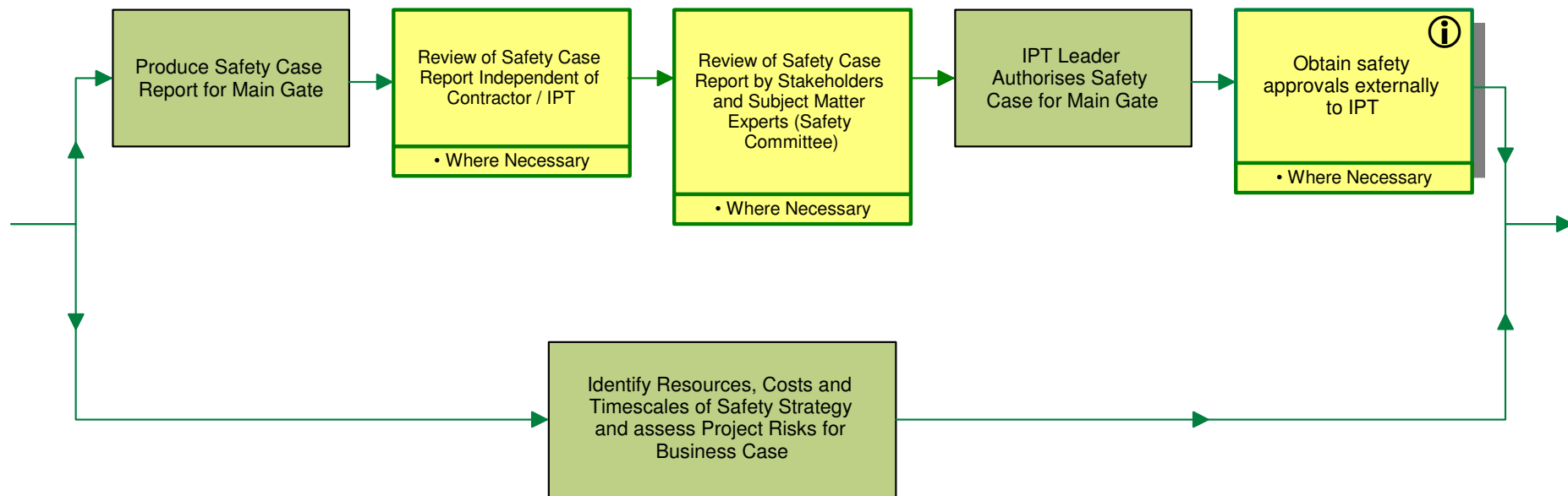
Assessment Phase

Demonstration & Manufacture Phase

In-service Phase

Disposal Phase

Safety Case Report preparation, review, endorsement and approval for MG



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Level 1 2 - D1 -

Obtain safety approvals externally to IPT

Concept Phase

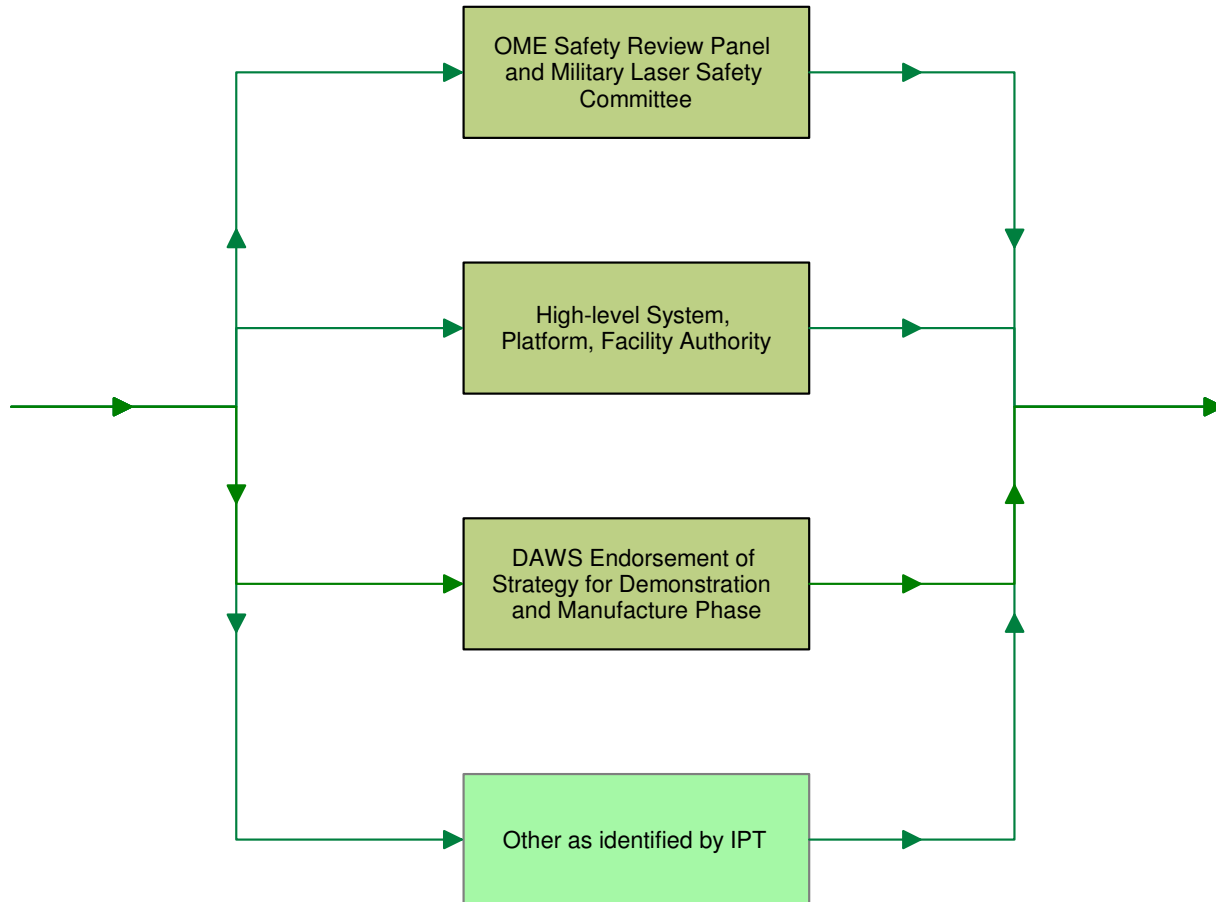
Assessment Phase

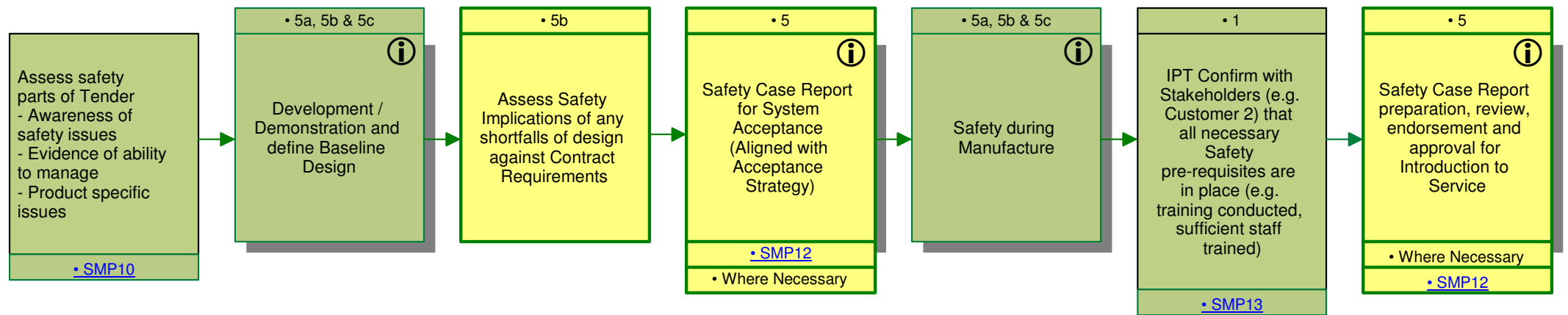
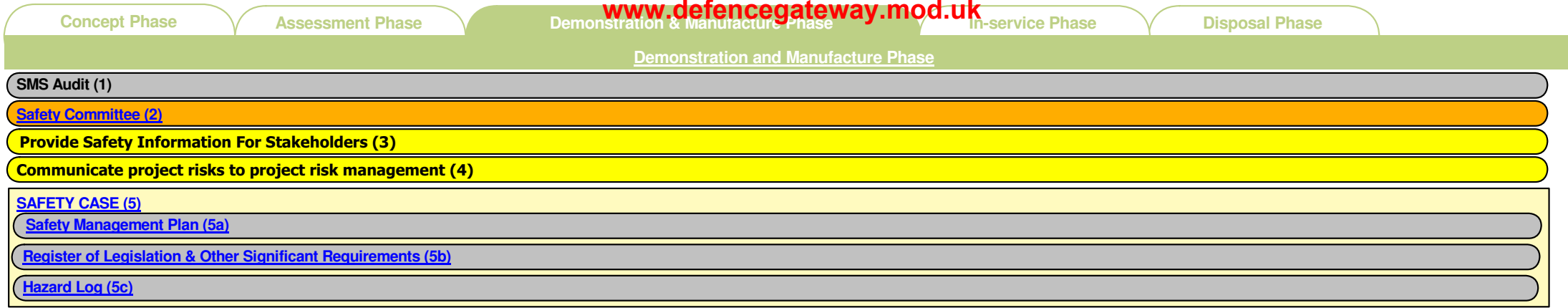
Demonstration & Manufacture Phase

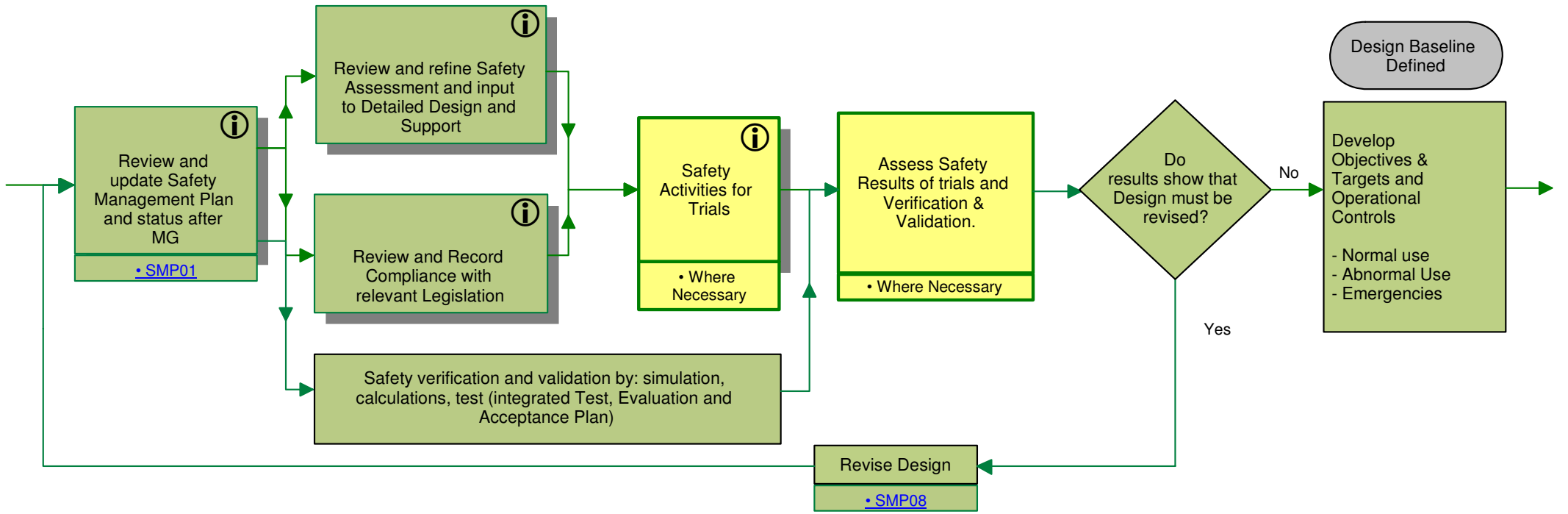
In-service Phase

Disposal Phase

Obtain safety approvals externally to IPT







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Level 1.3 - H2

Review and update Safety Management Plan and status after MG

Concept Phase

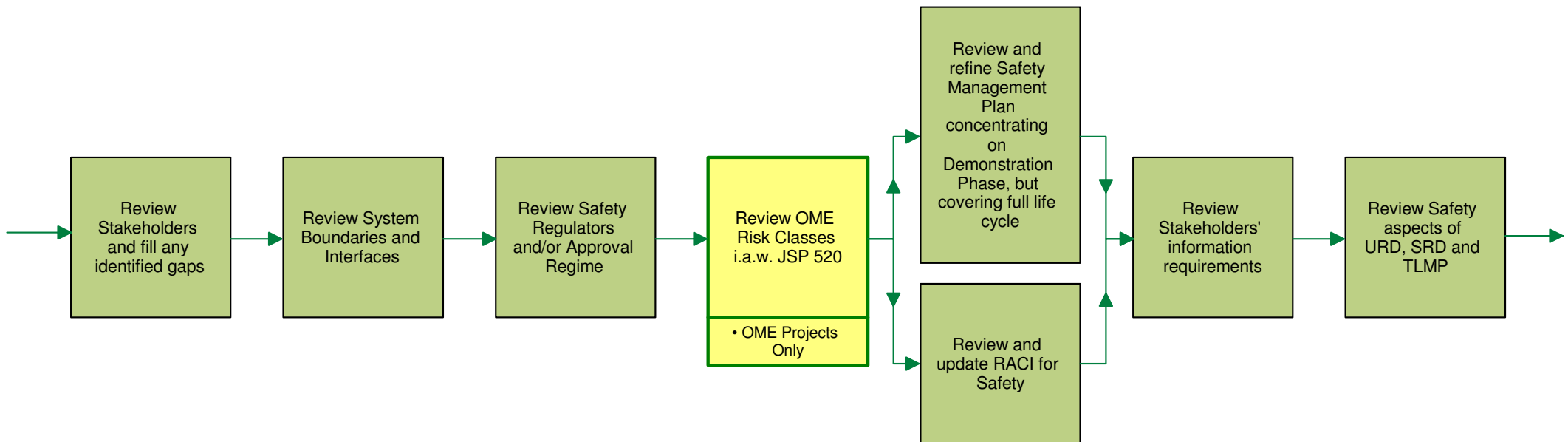
Assessment Phase

Demonstration & Manufacture Phase

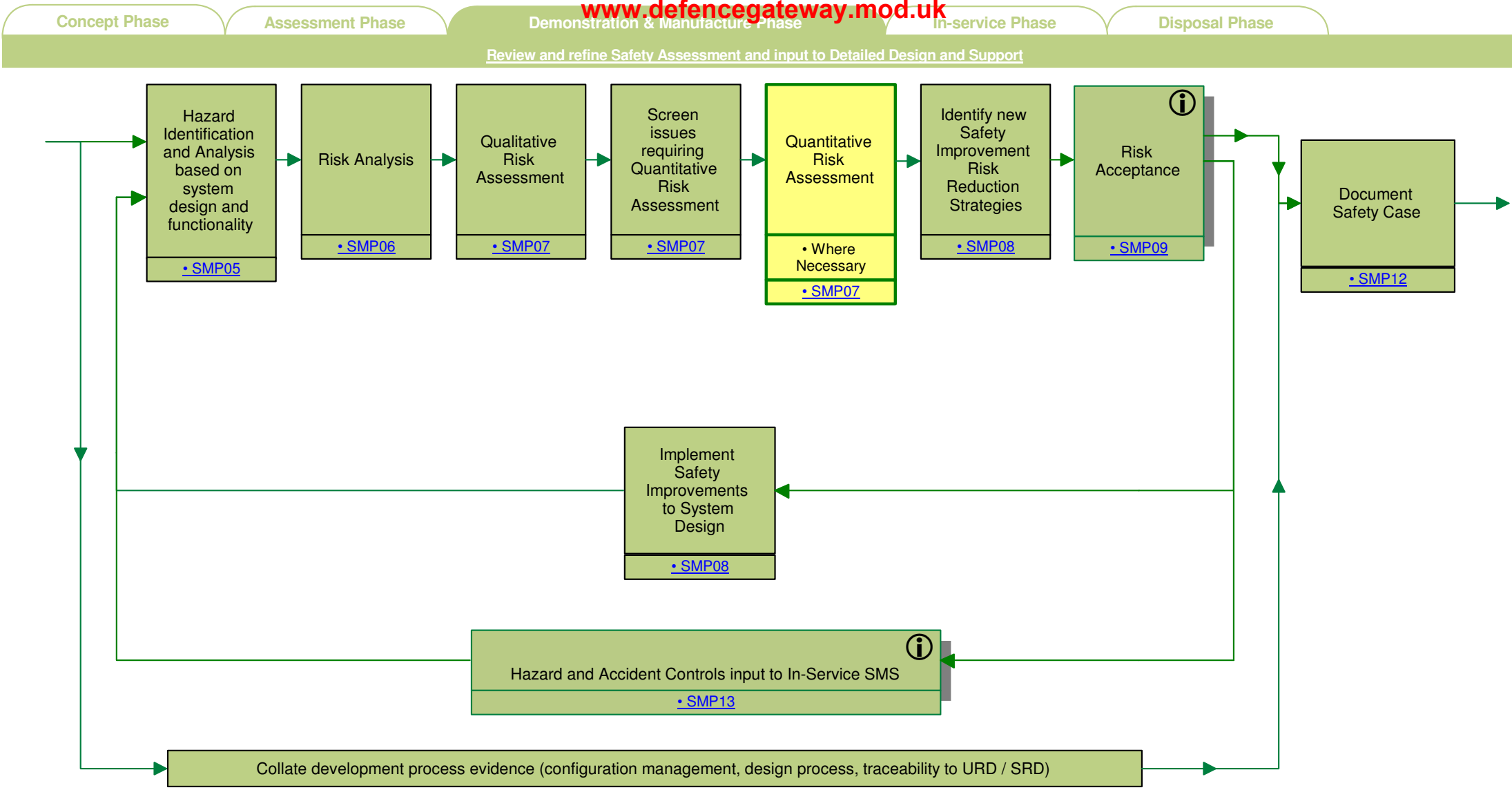
In-service Phase

Disposal Phase

Review and update Safety Management Plan and status after MG







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Level 1.3 - H1

Risk Acceptance

Concept Phase

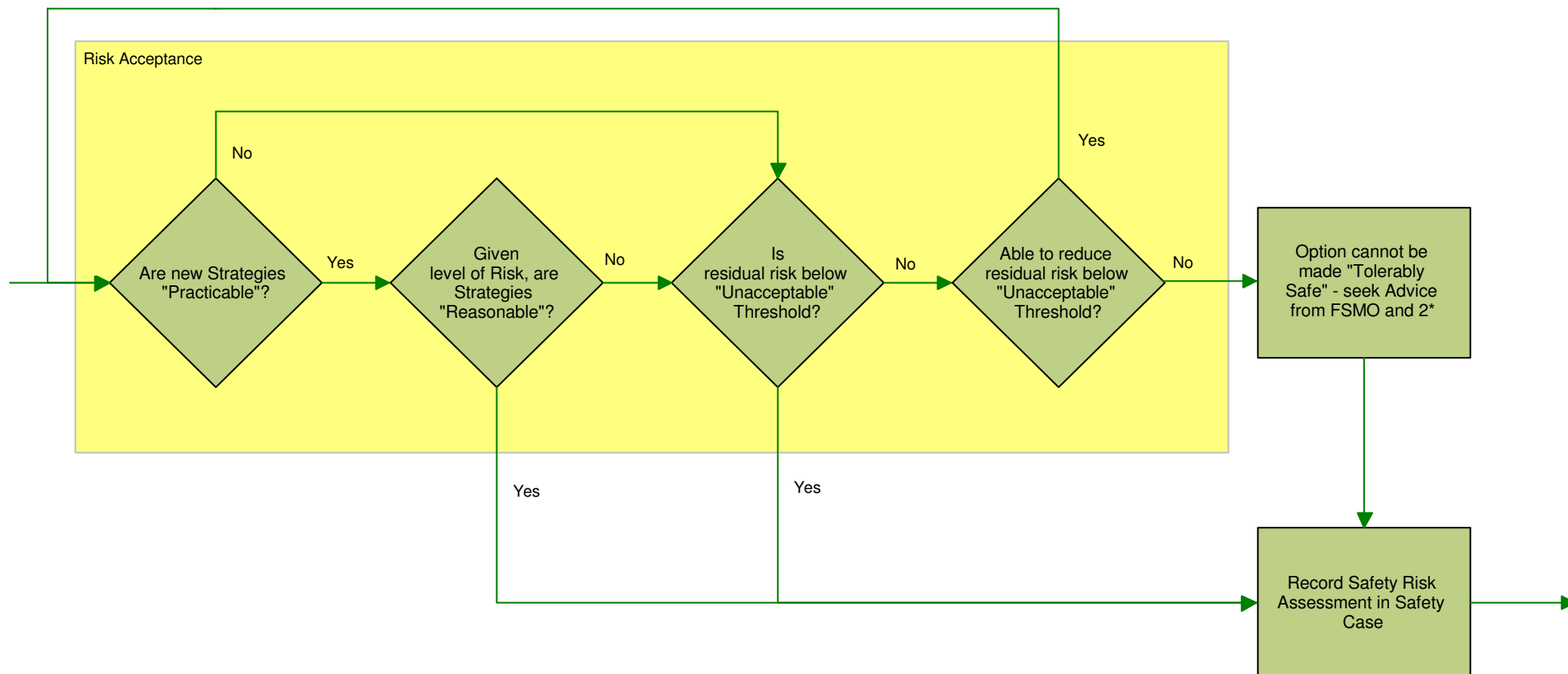
Assessment Phase

Demonstration & Manufacture Phase

In-service Phase

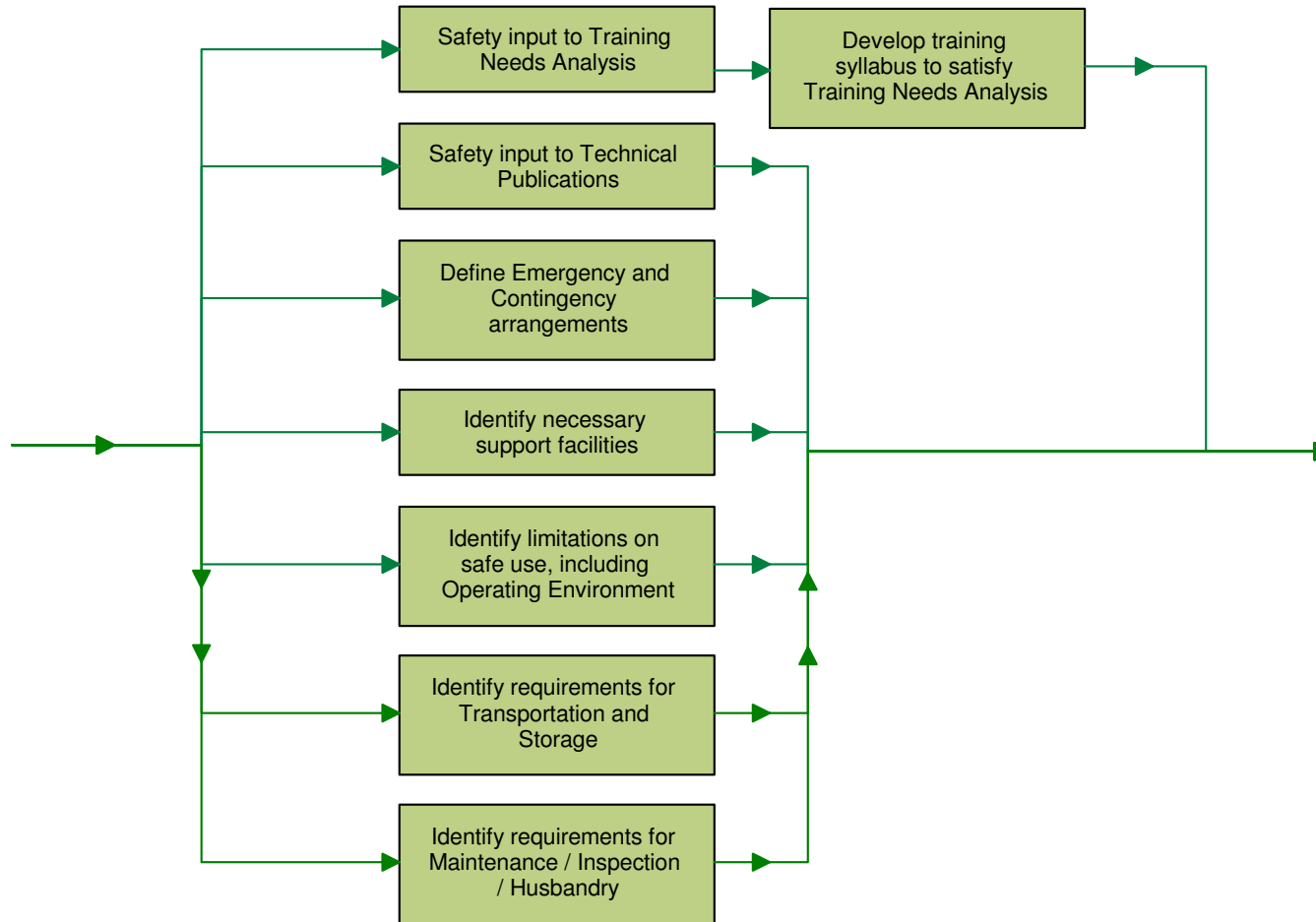
Disposal Phase

Risk Acceptance



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Hazard and Accident Controls input to In-Service SMS



Concept Phase

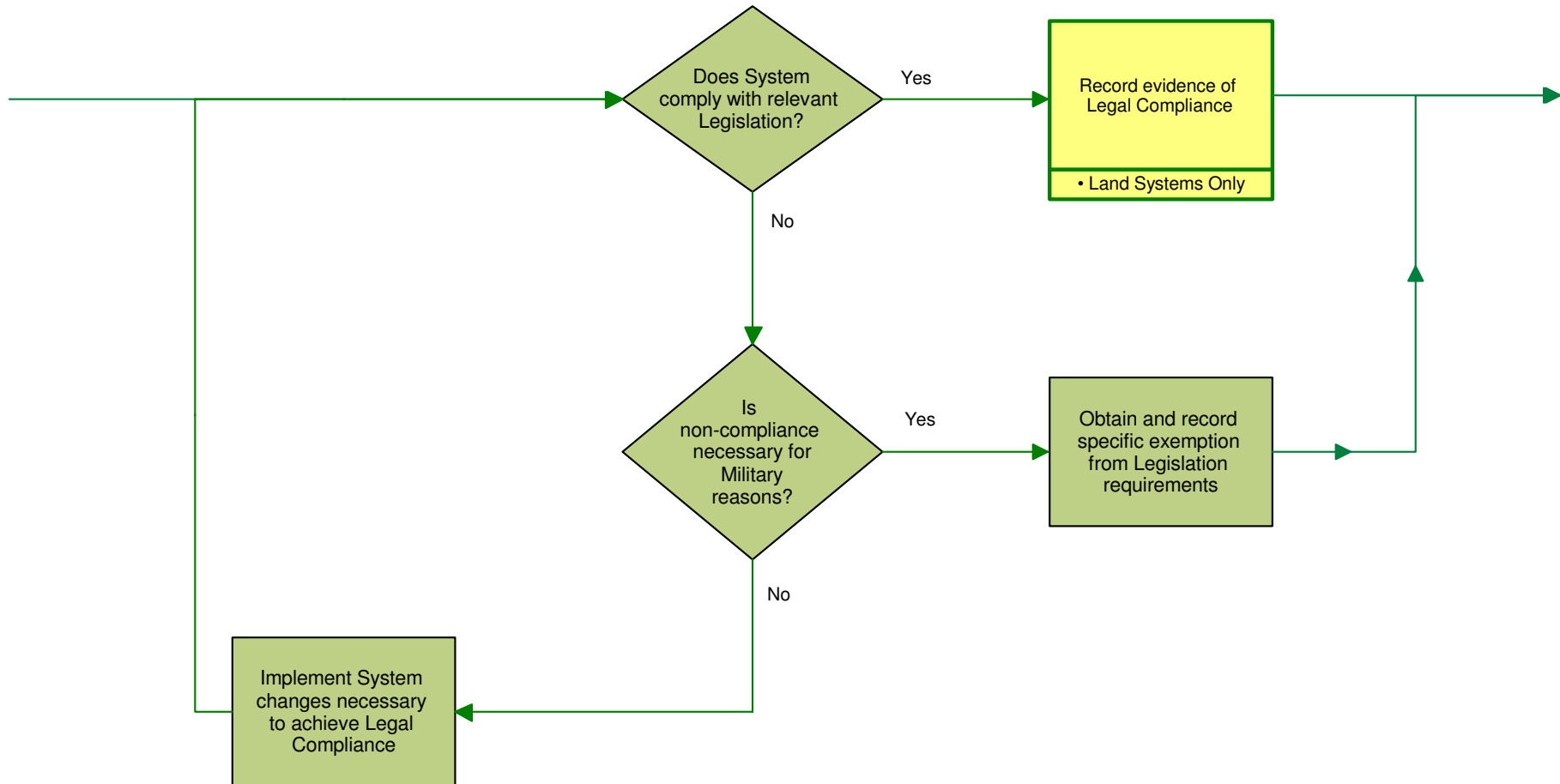
Assessment Phase

Demonstration & Manufacture Phase

In-service Phase

Disposal Phase

Review and Record Compliance with relevant Legislation



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Level 1.3 - H4

Safety Activities for Trials

Concept Phase

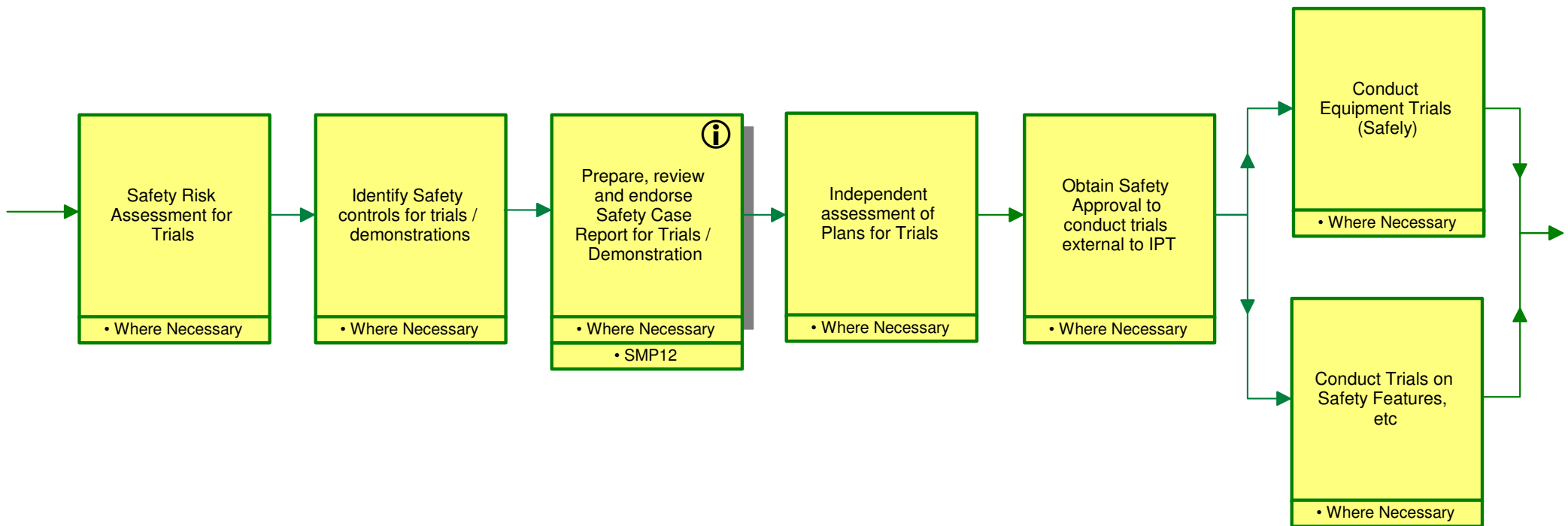
Assessment Phase

Demonstration & Manufacture Phase

In-service Phase

Disposal Phase

Safety Activities for Trials



Concept Phase

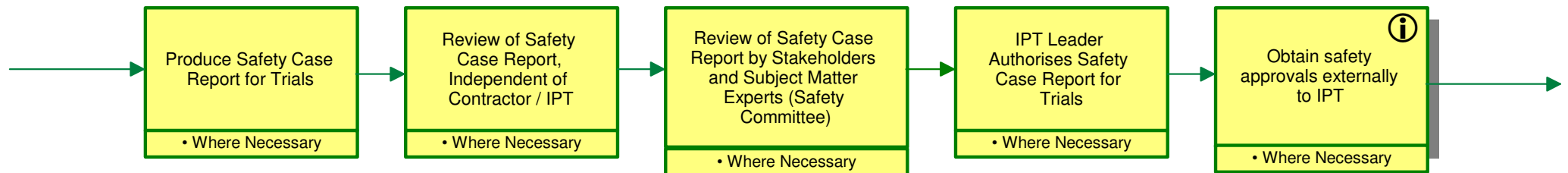
Assessment Phase

Demonstration & Manufacture Phase

In-service Phase

Disposal Phase

Prepare, review and endorse Safety Case Report for Trials / Demonstration



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Concept Phase

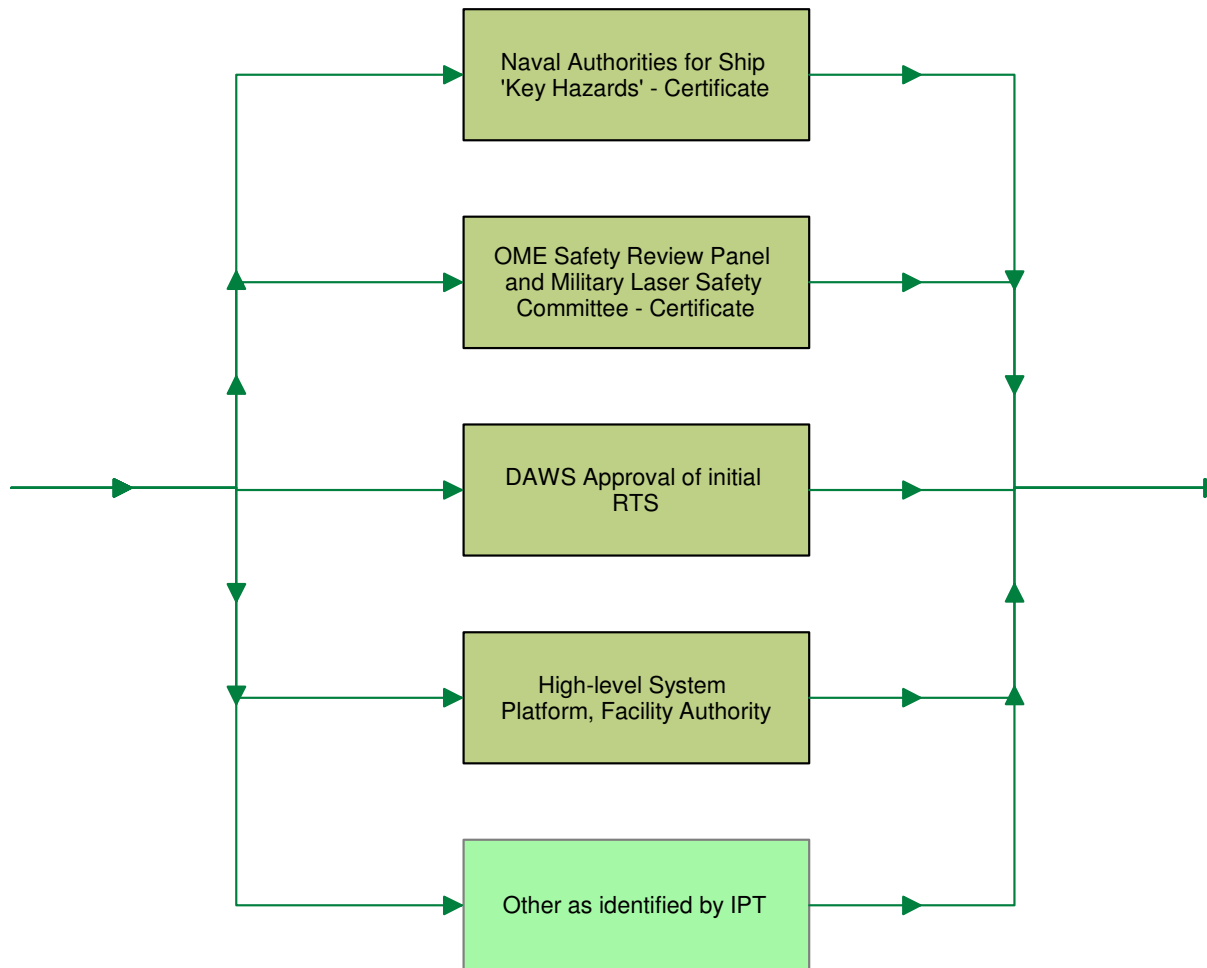
Assessment Phase

Demonstration & Manufacture Phase

In-service Phase

Disposal Phase

Obtain safety approvals externally to IPT



Concept Phase

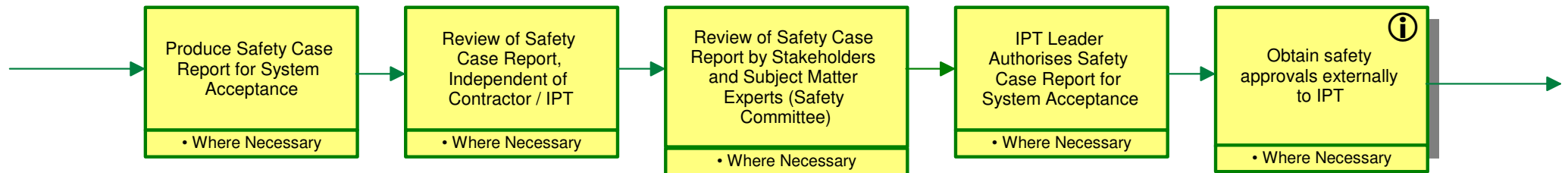
Assessment Phase

Demonstration & Manufacture Phase

In-service Phase

Disposal Phase

Safety Case Report for System Acceptance (Aligned with Acceptance Strategy)





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Level 1.3 - D1

Obtain safety approvals externally to IPT

Concept Phase

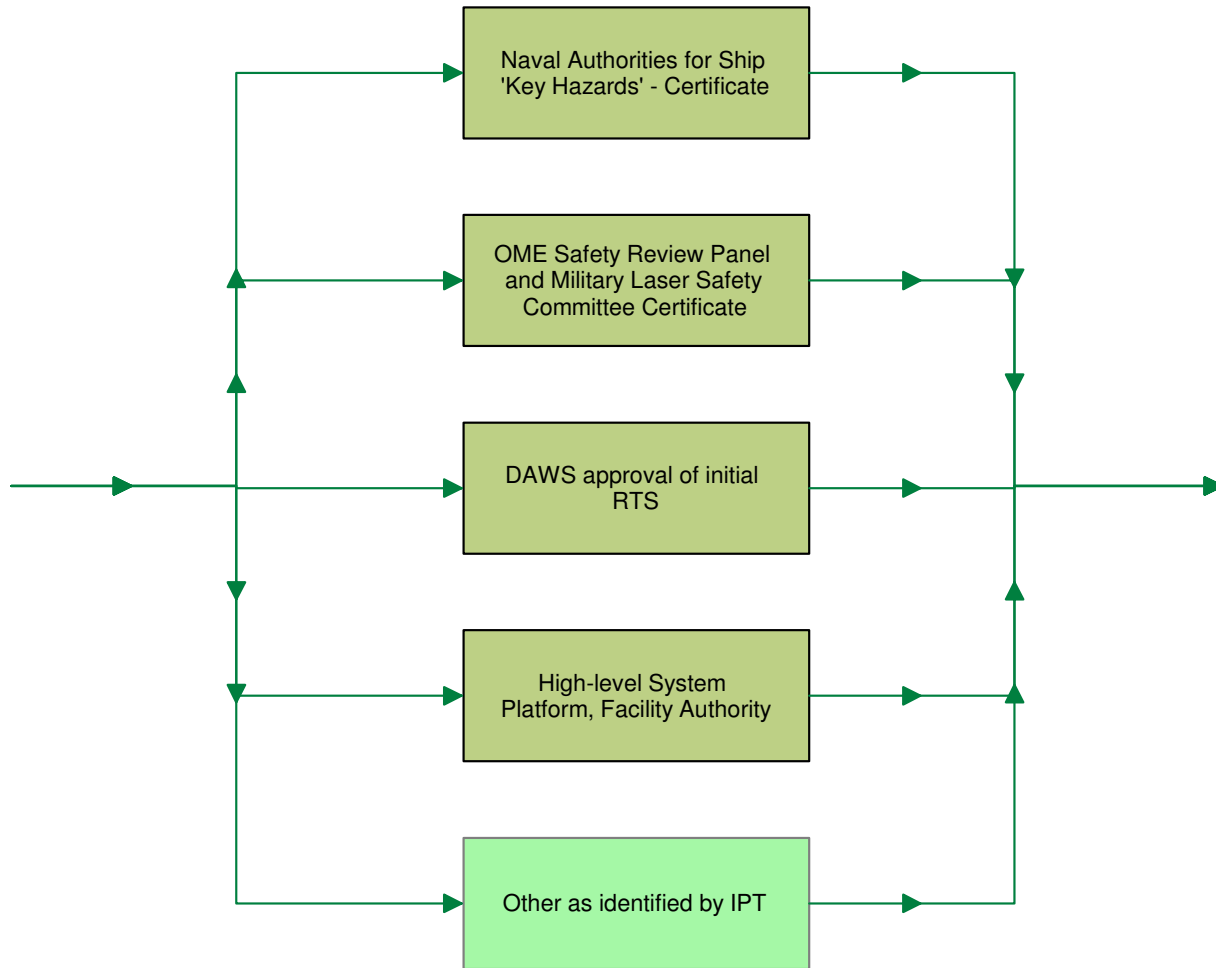
Assessment Phase

Demonstration & Manufacture Phase

In-service Phase

Disposal Phase

Obtain safety approvals externally to IPT



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Level 1.3

Safety during Manufacture

Concept Phase

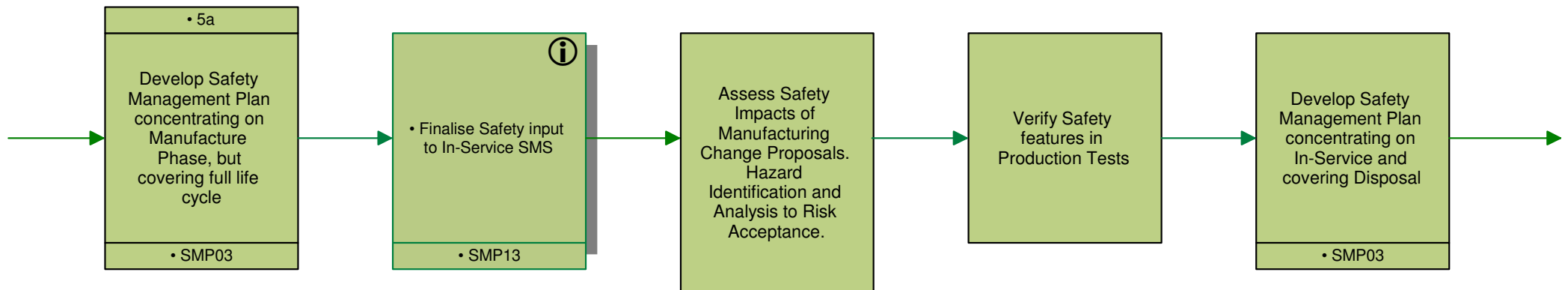
Assessment Phase

Demonstration & Manufacture Phase

In-service Phase

Disposal Phase

Safety during Manufacture



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Level 1.3 - I1

Finalise Safety input to In-Service SMS

Concept Phase

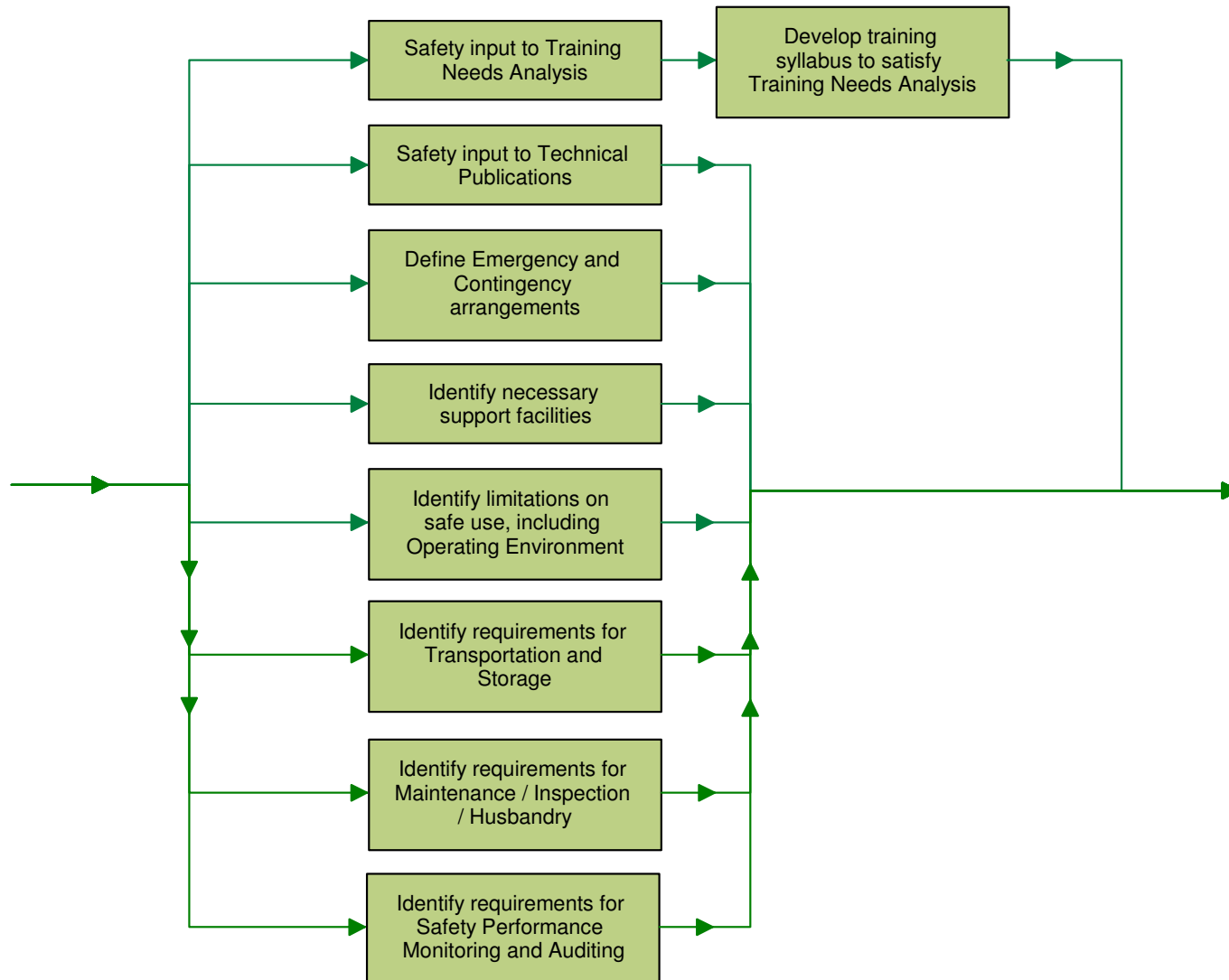
Assessment Phase

Demonstration & Manufacture Phase

In-service Phase

Disposal Phase

Finalise Safety input to In-Service SMS



Concept Phase

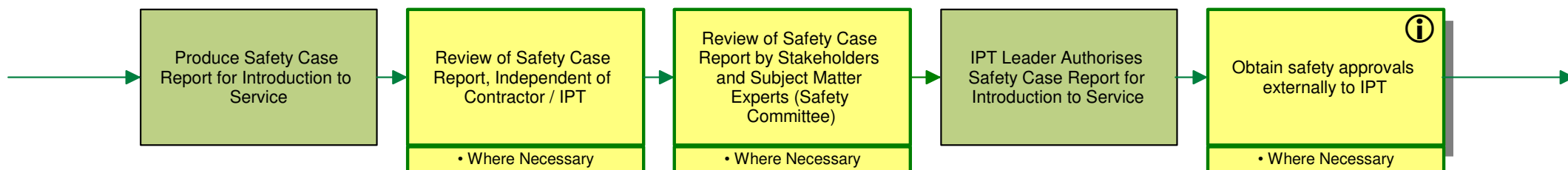
Assessment Phase

Demonstration & Manufacture Phase

In-service Phase

Disposal Phase

Safety Case Report preparation, review, endorsement and approval for Introduction to Service



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Level 1.3 - J1

Obtain safety approvals externally to IPT

Concept Phase

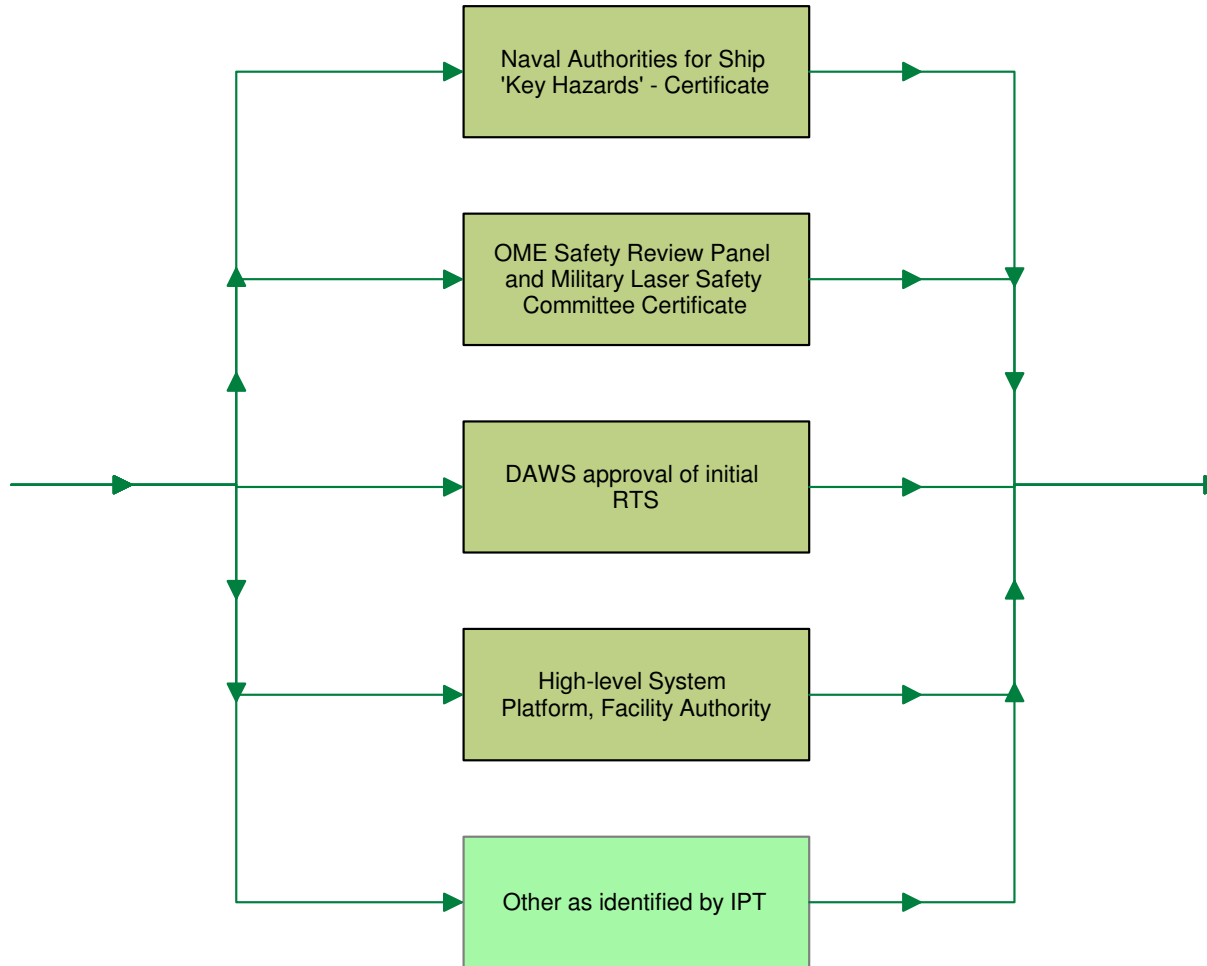
Assessment Phase

Demonstration & Manufacture Phase

In-service Phase

Disposal Phase

Obtain safety approvals externally to IPT



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Level 1.5

In-service Phase

Concept Phase

Assessment Phase

Demonstration & Manufacture Phase

In-service Phase

Disposal Phase

In-service Phase

SMS Audit (1)

[Safety Committee \(2\)](#)

Provide Safety Information For Stakeholders (3)

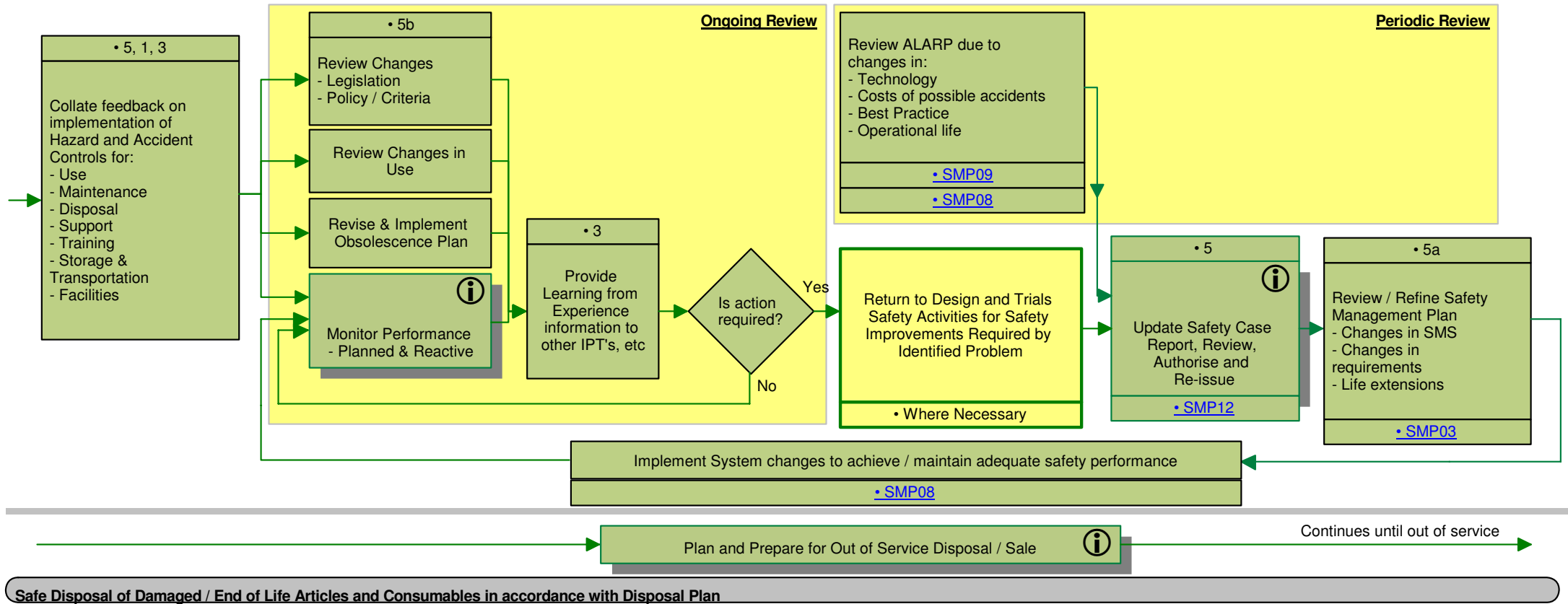
Communicate project risks to project risk management (4)

SAFETY CASE (5)

[Safety Management Plan \(5a\)](#)

[Register of Legislation & Other Significant Requirements \(5b\)](#)

[Hazard Log \(5c\)](#)



Concept Phase

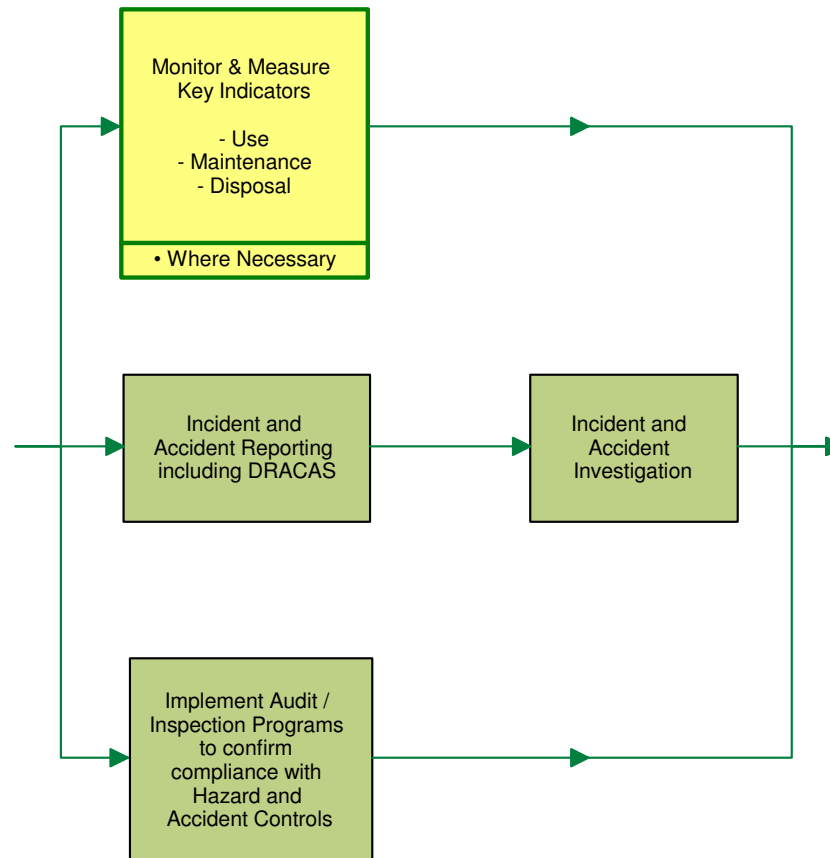
Assessment Phase

Demonstration & Manufacture Phase

In-service Phase

Disposal Phase

Monitor Performance - Planned & Reactive



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Concept Phase

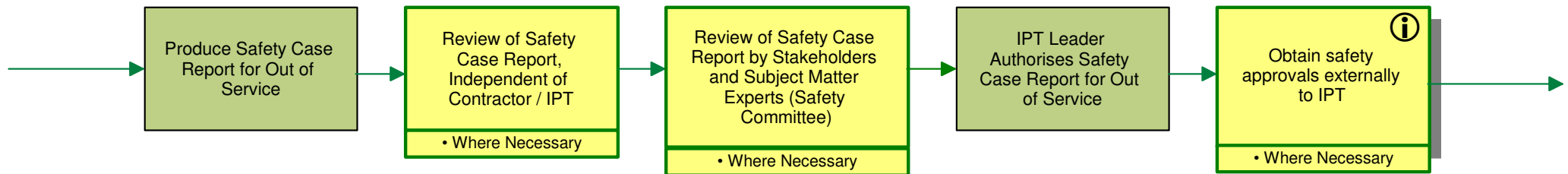
Assessment Phase

Demonstration & Manufacture Phase

In-service Phase

Disposal Phase

Update Safety Case Report, Review, Authorise and Re-issue





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Level 1.5 - B1

Obtain safety approvals externally to IPT

Concept Phase

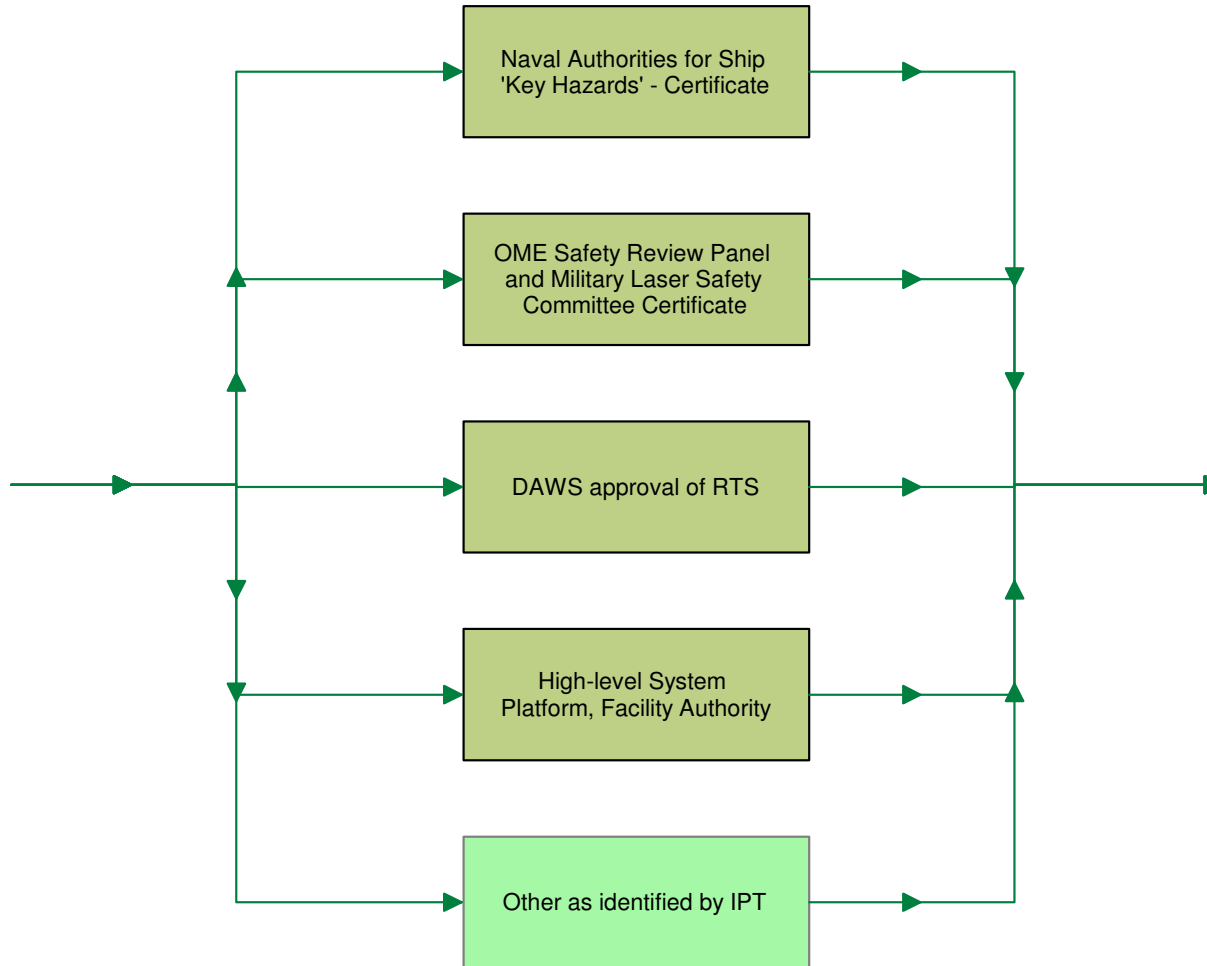
Assessment Phase

Demonstration & Manufacture Phase

In-service Phase

Disposal Phase

Obtain safety approvals externally to IPT



Concept Phase

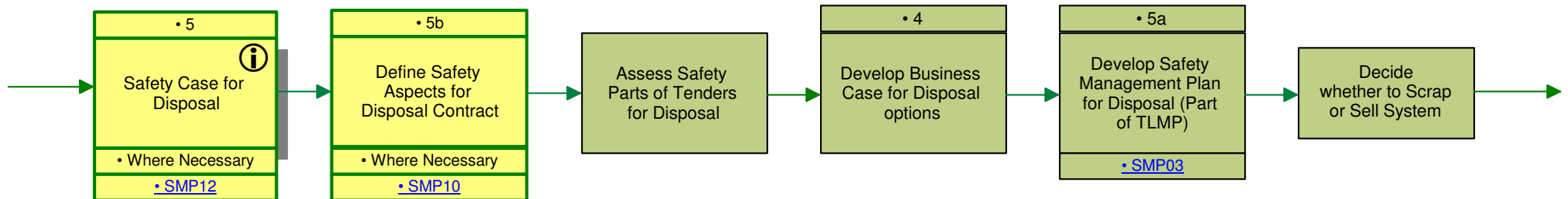
Assessment Phase

Demonstration & Manufacture Phase

In-service Phase

Disposal Phase

Plan and Prepare for Out of Service Disposal / Sale



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Level 1.5 - G1

Safety Case for Disposal

Concept Phase

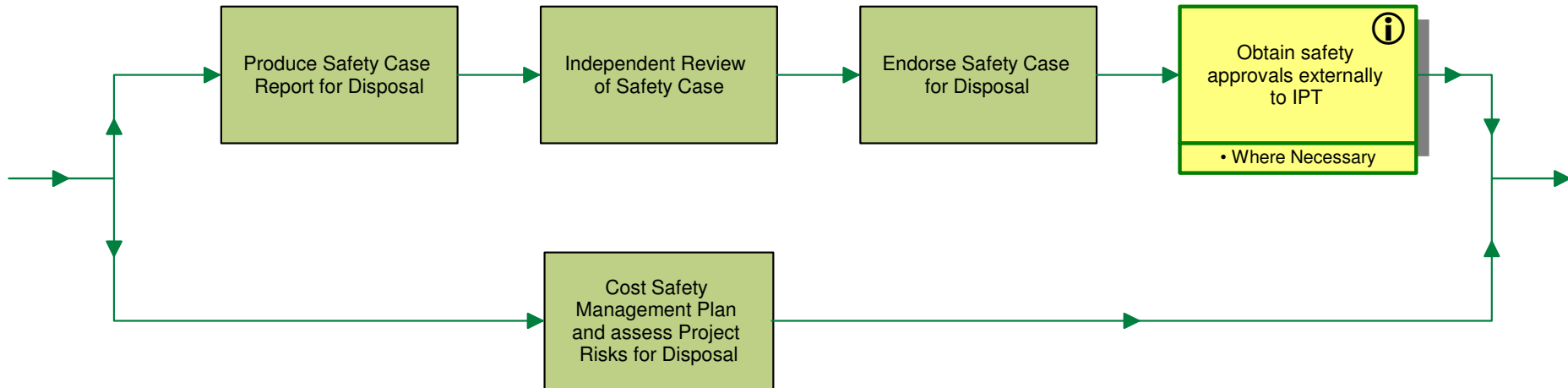
Assessment Phase

Demonstration & Manufacture Phase

In-service Phase

Disposal Phase

Safety Case for Disposal



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Level 1.5 - C1

Obtain safety approvals externally to IPT

Concept Phase

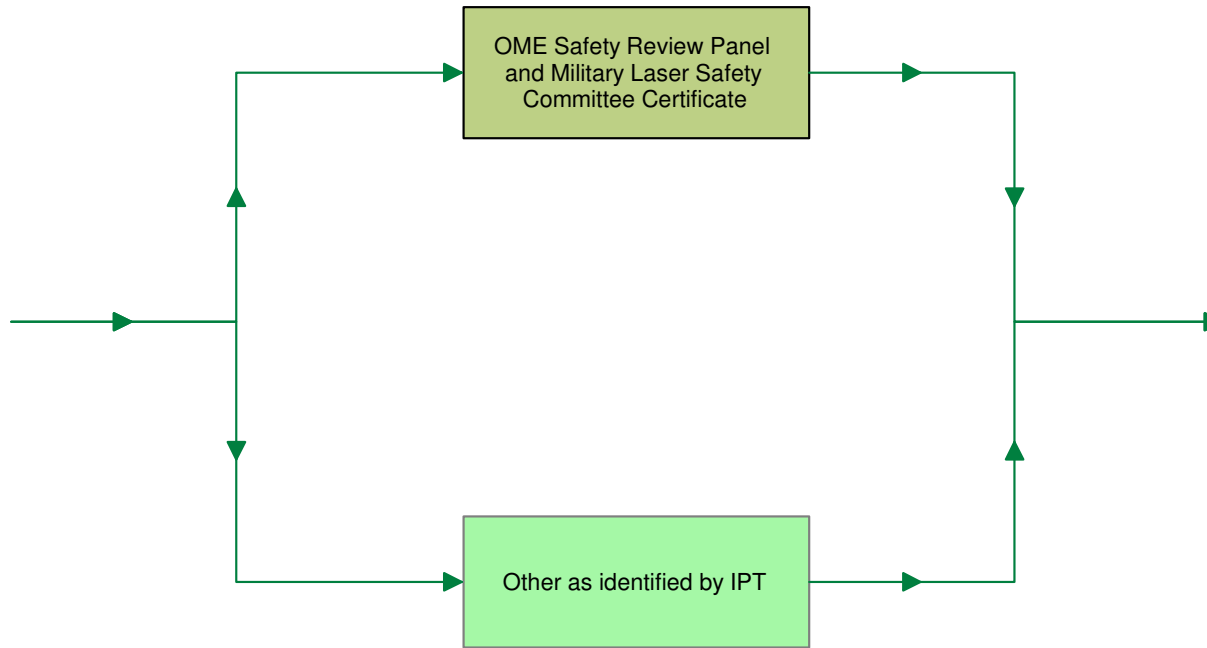
Assessment Phase

Demonstration & Manufacture Phase

In-service Phase

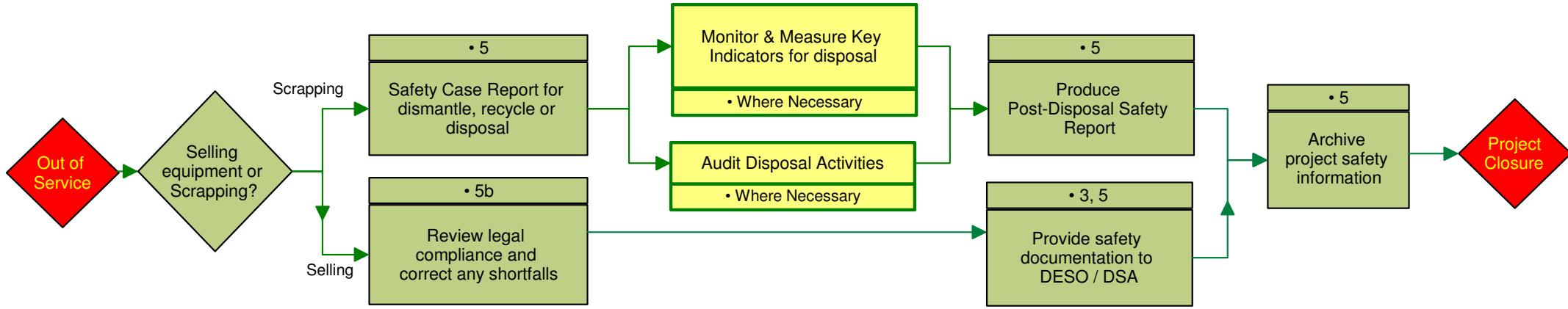
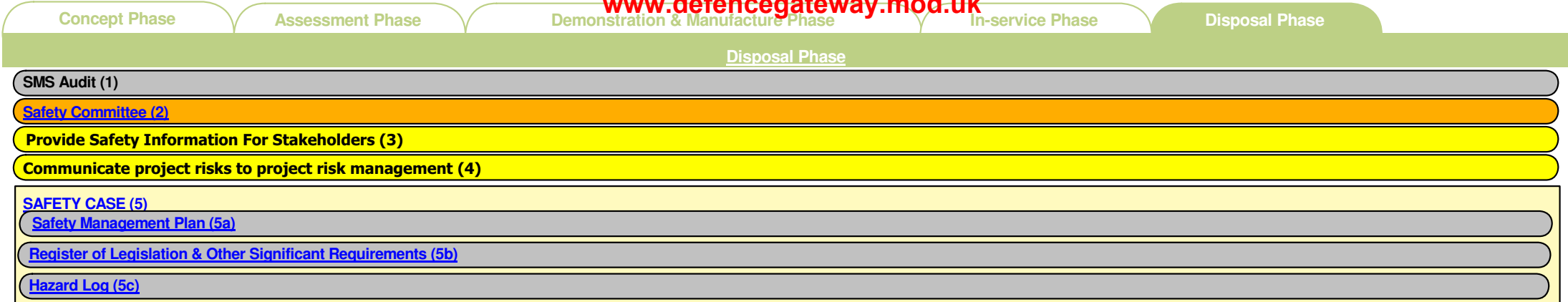
Disposal Phase

Obtain safety approvals externally to IPT



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MOD	Project Oriented Safety Management System ASEMS	SECTION 6
Core Procedures	<a href="http://www.defencegateway.mod.uk" style="color: red;">www.defencegateway.mod.uk</a>	Page 1

## 6 CORE PROCEDURES

**Table 6.1 - POSMS Core Procedures**

Number	Procedure Type	Procedure Name
SMP01	Core Procedure	Safety Initiation
SMP02	Core Procedure	Safety Committee
SMP03	Core Procedure	Safety Planning
SMP04	Core Procedure	Preliminary Hazard Identification and Analysis
SMP05	Core Procedure	Hazard Identification and Analysis
SMP06	Core Procedure	Risk Estimation
SMP07	Core Procedure	Risk and ALARP Evaluation
SMP08	Core Procedure	Risk Reduction
SMP09	Core Procedure	Risk Acceptance
SMP10	Core Procedure	Safety Requirements and Contracts
SMP11	Core Procedure	Hazard Log
SMP12	Core Procedure	Safety Case & Safety Case Report
SMP13	Core Procedure	In-Service SMS

### 6.1 The Thirteen System Procedures

6.1.1 The thirteen system procedures have been designed for use at various stages of the CADMID cycle and deal with the identification, assessment, and control and monitoring of the potential safety impacts and risks associated with the equipment or service being acquired.

### 6.2 Procedure Structure

6.2.1 For ease of use, the Procedures have the same format and structure. The following text outlines the key sections of the procedures and explains their purpose and contents:

Issue	Authorised by CESO DE&S	ISSUE LEVEL:	Release V2.2s
Approval	Authorised by DG S&E	DATE:	November 2007
DOCUMENT IS UNCONTROLLED IN PRINT			

<b>MOD</b>	<b>www.defencegateway.mod.uk</b>	Page 2
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***Procedure Title***

6.2.2 The title and reference code for the procedures are as follows:

- SMP for core POSMS procedures;
- EMP for core POEMS procedures;
- SSP for support procedures;
- AAP for assurance and audit procedures.

Note that support and assurance and audit procedures are common to both the POSMS and POEMS.

***Showing Conformance***

6.2.3 This explains the four ways of showing conformance with the procedure.

***Introduction***

6.2.4 This is an overview of the procedure’s purpose in the context of the overall management system.

***Procedure Objectives***

6.2.5 This section describes what is to be achieved by following and completing the procedures. Normally the section is in the form of a list of the objectives related to the procedure, which need to be achieved in order to demonstrate conformance.

***Responsibilities***

6.2.6 This section states the body/organisation that will have responsibility for both procedure management, ie who will be responsible for ensuring that the procedure is carried out correctly, and procedure completion ie who will actually carry out the actions within the procedure. In most cases the IPT will be responsible for procedure management while procedure completion could be either the IPT or a supplier, contractor or advisor.

***When***

6.2.7 This section states the stage or stages of CADMID at which the procedure is to be followed.

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	DATE:	November 2007

MOD Project Online Safety Management System ASEMS	<a href="http://www.defencegateway.mod.uk" style="color: red; font-weight: bold;">www.defencegateway.mod.uk</a>	Section 6 Page 3
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***Required Inputs***

6.2.8 Most of the procedures require the user to refer to the outputs of previous procedures and information from other sources. This section lists the reference material that will be needed in order to complete the procedure.

***Required Outputs***

6.2.9 Each procedure will have outputs, for example completed forms, compiled information etc which are listed in this section. It should be noted, however, that it is acceptable for an IPT to use alternative methods to those outlined in the procedures provided these produce equivalent actions and documentation, as defined in the objectives.

***Records and Project Documentation***

6.2.10 This includes advice on where outputs of the procedures should be kept and recorded (usually in the Safety or Environmental Case, Case Reports, or related registers and logs) and where other project documentation may also need to include some or all of the output information.

***Description***

6.2.11 This section makes up the bulk of the procedure and describes the steps and stages involved in completing the procedure. It includes advice and guidance on how to complete the procedure and advice on when to use each of the associated forms or tools. It should be remembered that this part of the procedure is guidance and it is not therefore mandatory for an IPT to follow procedural guidance to the letter where they have made suitable and equivalent alternative arrangements. The key point is to achieve the required objectives, outputs and outcomes

***Recommended Forms and Tools***

6.2.12 Many of the procedures include forms or tools to assist IPTs to undertake the procedure or to record information produced from following the procedure. This section lists the forms that may be useful completing the procedure. This can sometimes include forms associated with other procedures. Note that use of the forms is not mandatory (see Required Outputs above).

***Guidance***

6.2.13 This final section provides guidance on other sources of advice and guidance as well as possible alternative approaches for different procurement strategies and legacy systems. Also included here are some general comments on project risk which may arise if the procedure is not completed in an appropriate way or at an appropriate time.

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	DATE:	November 2007



<b>MOD</b>	<b>Project Oriented Safety Management System ASEMS</b>	SECTION <b>6</b>
Core Procedures	<a href="http://www.defencegateway.mod.uk" style="color: red;">www.defencegateway.mod.uk</a>	Page 4

## 6.3 Procedure Use

6.3.1 In the Concept stage, the Core Procedures will be completed by the IPT, with guidance from ASEG where necessary. After Concept, the work required to produce the Procedures outputs is likely to be completed by the equipment system contractor/supplier or for instance, by an environmental advisor retained by the IPT. This means the IPT's role may be to complete the procedure or to manage the completion of the procedure by the contractor or consultants to produce the required deliverables and outputs.

6.3.2 All procedures provide recommended guidance and/or forms to help the user to produce the desired output(s). The use of this guidance is not mandatory, as long as suitable alternative methodologies are used which achieve the desired objectives and deliverables, as defined in the procedure and that are deemed by ASEG to be equivalent. Therefore 4 options exist when following the procedures, to demonstrate conformance:

- Use the recommended guidance and forms, including allowed variations and options.
- Use an equivalent process and forms set generated elsewhere – document evidence of procedural equivalence.
- Use a bespoke process and forms set for the project – document how the bespoke procedure achieves system/procedure objectives.
- Where a procedure is considered to be not relevant, document the basis for this decision.

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<b>0</b>	<b>SHOWING CONFORMANCE</b>
<b>0.1</b>	<b>Options</b>
0.1.1	There are four options to demonstrate conformance when applying this system procedure: <ol style="list-style-type: none"> <li>a. Follow the defined system procedure using the recommended guidance and tools, including allowed variations and options.</li> <li>b. Use an equivalent process and tool set generated elsewhere and document evidence of procedural equivalence.</li> <li>c. Use a bespoke process and tool set for the project and document how the bespoke procedure achieves the objectives defined for this system procedure.</li> <li>d. Where the procedure is considered to be not relevant, document the basis for this decision.</li> </ol>
<b>1</b>	<b>INTRODUCTION</b>
1.1.1	This procedure describes the start up of safety management activities on a project. It identifies safety stakeholders, and legislative and other standards that need to be satisfied. The procedure also creates the key elements of the safety management organisation for the project.
1.1.2	In normal circumstances this procedure would be applied at the outset of a project, early in the Concept phase. However, it can be applied at any point of the life cycle where it is necessary to initiate a formal Safety Management process on an existing system. The procedure may also be re-applied at significant points in the life cycle (eg after Main Gate approval), to review and update the project safety arrangements and ensure that they continue to be appropriate.
1.1.3	This procedure assumes that the IPT Leader has already been appointed and has been assessed as having appropriate competence in Safety Management to receive Safety delegation defining his responsibilities for Safety.
<b>2</b>	<b>PROCEDURE OBJECTIVES</b>
2.1.1	The purpose of Safety Initiation is to ensure that the Safety Management process is commenced on a firm basis by identifying basic information, interfaces and responsibilities. These include: <ol style="list-style-type: none"> <li>a. Stakeholders (including industry);</li> <li>b. Regulators and Approval Authorities;</li> <li>c. Project Safety Manager;</li> </ol>

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- d. Independent Safety Auditor if appropriate;
- e. Safety Committee;
- f. Project Safety RACI;
- g. Lead FSMO.

### 3 RESPONSIBILITIES

#### 3.1 Accountability

- 3.1.1 The IPTL is accountable for the completion of this procedure.
- 3.1.2 The IPTL is required to appoint a Safety Manager (or a joint Safety and Environmental Manager) with appropriate competency in Safety Management, but ultimate responsibility for setting up the safety organisation remains with the IPT Leader.

#### 3.2 Procedure Management

- 3.2.1 The IPTL may delegate the management of this procedure to a member (Safety Manager) or members of the IPT.

#### 3.3 Procedure Completion

- 3.3.1 The IPT Safety Manager(s) should identify the legislation, regulators and approval authorities that the project will need to satisfy, and any requirements for independent safety certification.
- 3.3.2 The IPT Safety Manager(s) should maintain a legislative register as an integral part of the Safety Case for each project.
- 3.3.3 The internal and external auditors should check for legal and policy compliance as part of their assessment of the Safety Management System, Safety Management Plan and Safety Case. It should be noted that responsibility for compliance still rests with those with delegated responsibility rather than with the auditor.
- 3.3.4 The various Functional Safety Management Offices (FSMOs ie Ship, Land, Airworthiness, Ordnance, Nuclear) will assist IPT Leaders in identifying those acquisition programmes that have potential safety implications.

### 4 WHEN

#### 4.1 Initial Application

- 4.1.1 In an acquisition programme, the procedure should be carried out early in the Concept Phase. Stakeholders, system boundaries, supporting systems/arrangements, and relevant Regulator(s) and Acceptance Authorities need to be identified as early as possible to support the subsequent Preliminary Hazard Analysis activity (Procedure SMP04 – Preliminary Hazard Analysis) and the preparation of Project Safety Plan.

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4.1.2 The procedure can also be applied at any point of the life cycle where it is necessary to initiate a formal Safety Management process.

#### 4.2 Review

4.2.1 The registers of stakeholders and requirements should be reviewed and updated after Initial and Main Gate as part of the review and update of the Project Safety Plan.

### 5 REQUIRED INPUTS

5.1.1 The Procedure may use the following reference inputs, as available:

- a. User Requirements Documentation (for Acquisition Programmes);
- b. Any other information on the proposed functionality, use, support and context of the proposed system;
- c. Existing Hazard Logs for existing similar systems;
- d. Relevant MOD Publications including:
  - i. JSP430 MOD Ship Safety Management;
  - ii. JSP454 MOD System Safety and Environmental Assurance for Land Systems;
  - iii. JSP518 Regulations for the Naval Nuclear Power Programme;
  - iv. JSP520 Ordnance, Munitions and Explosives Safety Management System;
  - v. JSP553 Military Airworthiness Regulations;
  - vi. DEFSTAN 00-56 Safety Management Requirements for Defence Systems;
  - vii. DS&E Safety and Environmental Management Instructions;
  - viii. CDM's Organisation and Arrangements for Environment and Safety Management;
  - ix. Defence Aviation Safety Management System (DASMS);

### 6 REQUIRED OUTPUTS

6.1.1 The Outputs of the procedure will comprise:

- a. Appointed Project Safety Manager and Independent Safety Auditor, if appropriate;
- b. Completed **Form SMP01/F/01** - Safety Operating Environment Questionnaire;
- c. Completed **Form SMP01/F/02** - Register of Stakeholder Requirements and Information;
- d. Completed **Form SMP01/F/03** - Register of Safety Legislation and Other

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Significant Requirements.	
<b>7</b>	<b>DESCRIPTION</b>
<b>7.1</b>	<b>Questionnaire</b>
7.1.1	The questionnaire contained in <b>Form SMP01/F/02</b> - Register of Stakeholder Requirements and Information, should be completed and sent to the Functional Safety Management Office considered by the IPT to be most relevant. The FSMO will then co-ordinate future help and advice across the safety community.
<b>7.2</b>	<b>Stakeholder Identification</b>
7.2.1	<p>A Stakeholder is anyone who will be affected by the introduction of the system and who needs to be consulted or informed about the development and fielding of the system, and anyone who contributes to the ultimate acceptance of the project. This may include Individuals or groups that:</p> <ul style="list-style-type: none"> <li>a. have safety responsibilities at any stage of the project;</li> <li>b. have safety requirements (including information) from the project;</li> <li>c. hold safety information relevant to the project (eg other IPTs with interfacing or sub-systems);</li> <li>d. have specialist or operational knowledge that can aid the project in achieving safety requirements.</li> </ul>
7.2.2	<p>As a minimum the following should be consulted:</p> <ul style="list-style-type: none"> <li>a. ECC;</li> <li>b. Equipment User;</li> <li>c. DS&amp;E;</li> <li>d. ASEG;</li> <li>e. other IPTs involved in any sub-systems of the project;</li> <li>f. other IPTs involved with systems, projects or systems platforms with which the system/project will be closely associated;</li> <li>g. Subject Matter Experts (SMEs) with specialist technical or professional expertise in a subject area relevant to the Project;</li> <li>h. Relevant Safety Management Offices (via Questionnaire <b>Form SMP01/F/01</b> - Safety Operating Environment Questionnaire and directly).</li> </ul>
7.2.3	When Stakeholders have been identified, their contact details and involvement in the project should be recorded in the Stakeholders Register.
<b>7.3</b>	<b>Identify Applicable Legislation, Standards and Requirements</b>

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- 7.3.1 This is the initial identification of potentially applicable safety standards and requirements (including legislation, policy and best practise standards) that may apply to the project over its lifetime. The Register of Safety Legislation and Other Significant Requirements (see **Form SMP01/F/03** - Register of Safety Legislation and Other Significant Requirements) can be used to list and document these standards for each of the life cycle stages. A separate sheet should be used for each standard identified.
- 7.3.2 Note that this will be an evolving process through several stages of the project. The Preliminary Hazard Identification and Analysis procedure (Procedure SMP04 – Preliminary Hazard Identification and Analysis) will identify additional requirements, to be consolidated in the Safety Requirements (see Procedure SMP10 – Safety Requirements and Contracts).
- 7.3.3 Useful information sources include:
- a. Other equipment Safety JSPs;
  - b. Other relevant legislation and standards for non-UK operations.
- 7.4 Create Project Safety Organisation**
- 7.4.1 Ultimately, the Project Safety Management Organisation will be defined in the Safety Management Plan (Procedure SMP03 – Safety Planning). However, in advance of preparation of this document, it is necessary to set up key elements of the Safety Management Organisation, as follows:
- a. Appoint competent Project Safety Manager. (Responsibilities defined in DE&S SEMI);
  - b. Appoint Independent Safety Auditor, if required;
  - c. Form Project Safety Committee (membership and role defined in Procedure SMP02 – Safety Committee);
  - d. Produce high level definition of other project safety responsibilities, in the form of an initial project RACI (Responsible, Accountable, Consulted, Informed) chart for the Safety Management process defined for this stage of the project.

**8 RECORDS AND PROJECT DOCUMENTATION**

- 8.1.1 Where relevant, the outputs from this procedure should feed into the following:
- a. SRD (System Requirements Document) – for any specific Safety requirements;
  - b. CSA (Customer Supplier Agreement) – to document agreements on Safety information to be delivered by the IPT;
  - c. TLMP (Through Life Management Plan);
  - d. Safety elements of Initial Gate submissions.

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8.1.2 In addition, as the competence of the Project Safety Manager is relevant to the safety assurance on the project, the evidence should be retained from the selection process that the appointed individual is competent to perform the required responsibilities.

**9 RECOMMENDED TOOLS AND FORMS**

- 9.1.1 To assist in the process, IPTs should complete a safety and environmental operating environment questionnaire shown in **Form SMP01/F/01** - Safety Operating Environment Questionnaire.
- 9.1.2 An initial register of Stakeholders should be developed using the format shown in **Form SMP01/F/02** - Register of Stakeholder Requirements and Information, and it should be reviewed and updated as the project proceeds.
- 9.1.3 An initial register of Legislative and other requirements should be developed using the format shown in **Form SMP01/F/03** - Register of Safety Legislation and Other Significant Requirements, and it should be reviewed and updated as the project proceeds.
- 9.1.4 The IPT must consider addressing Legislation and Similar Issues amongst Standardization issues especially when producing and reviewing the Standardization Strategy and Implementation Plan (SSIP). These issues occur throughout the life of the Project which the IPT controls These also occur when updating the *Project Standards Database* (PSDB), SSIP Annex E, and *Project Safety Initiation documents SMP01/F/03s* with changes in Legislation and International Agreements.

**10 GUIDANCE**

10.1.1 Although this is written as a safety procedure, it is recognised that at this early stage the safety and environmental processes are very similar and may be carried out together. Where appropriate, the same formats and tools are recommended for stakeholder and legislative requirements to provide a single consistent basis for subsequent safety and environmental activities. These tools are described here for completeness. It is also recognised that in many projects, the roles of Safety and Environment Manager may be combined, and a single Safety and Environmental Committee may exist.

**10.2 Questionnaire**

10.2.1 Completion of the questionnaire (**Form SMP01/F/02** - Register of Stakeholder Requirements and Information) will enable the Functional Safety Management Offices (FSMOs) to identify the most relevant Office for advice and guidance on hazard identification, and all subsequent tasks related to that project. FSMOs will then assign a member of their staff as the lead FSMO point of contact for all safety

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and environmental matters arising from that project and to co-ordinate future help and advice across the safety and environmental assessment community.

**10.3 Stakeholder Identification**

10.3.1 Initially, stakeholders identified and consulted at this stage will be restricted to MOD. However, any relevant external stakeholders identified eg other Government departments, industry, research organisation, regulatory bodies etc should be logged and included in a communication plan which identifies when they should be consulted, by whom and for what purpose. The IPTL may choose to include external stakeholders at this stage.

10.3.2 Note that for projects/systems that involve a high number of stakeholders, consideration should be given to developing a project communication plan that includes contact details, information requirements, lines of communication, responsibilities and any relevant security considerations.

**10.4 Identify Applicable Legislation, Standards and Requirements**

10.4.1 The identification of relevant legislation at the start of any project is essential so that any conditions for compliance can be incorporated into the Acquisition process. Safety Managers are expected to identify and maintain a register of applicable legislation as part of the development of the Safety Case, and to continuously review it and revise it as necessary.

10.4.2 Within the MOD, each project's Legislative Register should be taken to include matters of Government or European Union policy, especially where these bind all UK government departments, including MOD. Recourse to law by European institutions is increasingly possible for non-compliance with European policy for public procurement.

- 10.4.3 The organisation uses a number of methods of enabling compliance:
- a. IPTs develop System Requirement Document (SRD) to meet User Requirement Document (URD) statements from the Equipment Capability Customer. This is an important method for advising industry of the MOD's safety and environmental requirements;
  - b. The TLMP incorporates the impact of safety and environment legislation on the relevant equipment both now and in the future (The Project Safety and Environment Plans are integral parts of the TLMP);
  - c. Use of DEFCONs and DEFFORMs in the development of contracts and contract conditions.

10.4.4 Where the IPT also develops the URD on behalf of the Equipment Capability Customer, it is extremely important that these reflect the DS&E safety and environmental performance objectives and targets, recognising and emphasising any politically or publicly sensitive issues. The advice of organisational Subject Matter Experts (SMEs) from the FSMOs and DS&C must be sought in the construction of

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the URD.

10.4.5 Although reference to DEFCONs and DEFFORMs provides MOD with some protection, the Invitation to Tender (ITT) must explicitly describe the project’s requirements for safety and environmental management, compliance and performance as result from the URD and SRD and the project’s Safety Management Plan.

10.4.6 Access to information about safety and environmental legislation is enabled via a number of organisations and media – the following provides some primary examples:

- a. DS&C Legislative Register. DS&C have established a list of legislative requirements which IPTs are expected to respond to. The DS&C database is available within each Safety Management Office.
- b. Legislative Registers held by the FSMOs;
- c. FSMO intranet pages, DS&E’s Safetynet etc.
- d. Websites and publications of the HSE, Professional Societies and of lawyers or consultancies specialising in providing information and knowledge of safety and environmental matters and current affairs;
- e. Suppliers, contractors and consultants;
- f. Other projects and IPTs.

10.4.7 Identification of and compliance with all relevant safety and environmental legislation is always ultimately the responsibility of the IPT Leader with delegated authority.

10.4.8 Since safety and environmental legislation is continuously evolving, IPTs are strongly recommended to seek expert advice on new requirements that might be likely to come into force during the project life cycle

10.4.9 A list of approved specialist consultants is available as part of the Safety and Environment enabling arrangement, jointly managed by the FSMOs. These can be appointed by IPTs to provide expert advice and assistance. More information is available from the Knowledge Base: Home/IPTs & SGs/Support Groups/Air Land Technology Group/Safety Management/SSESA.

10.4.10 The ‘compliance matrix’, available from this site, shows which contractors are competent in particular areas.

**10.5 Create Project Safety Organisation**

10.5.1 Appointment of an Independent Safety Auditor (ISA) is advisable for projects that are complex, novel, or assessed as having high levels of safety risk. Appointment of an ISA may also be mandated by domain specific Joint Service Publications. For further guidance, refer to the AOF.

**10.6 Guidance for Different Acquisition Strategies**

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10.6.1 The requirements for Project Safety Initiation do not change for Acquisition conducted through intergovernmental agreements, OCCAR, multilateral or collaborative programmes. It is MOD policy that the same standards are met, and that assurance that these standards have been met can be demonstrated.

**10.7 Warnings and Potential Project Risks**

10.7.1 If IPT Leaders fail to carry out this procedure in a timely manner, there will be delays in engaging stakeholders, recognising legislative or other requirements, or creating the safety organisation. This will inevitably result in risks to project costs and timescales.

10.7.2 If the project fails to co-ordinate the treatment of stakeholders and legislative requirements between safety and environmental management system, there is a risk that there will be inconsistent communication to stakeholders and duplication or omission of requirements (eg falling between the two).

10.7.3 The legislative and other requirements register should not be read across from one project to another, even if they are similar in scope, without a detailed review.

10.7.4 Competence of Safety Managers and Independent Safety Auditors is critical to the safety success of the project. It is important that this competence should be assured, and that records demonstrating that this has been done should be retained. If this is not done it will be difficult to demonstrate that IPT Leaders have discharged their responsibilities correctly.

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Form SMP01/F/01 - Safety Operating Environment Questionnaire		
No.	Question	Answer
1.	In which environment will your platform, equipment, system or service principally operate ie Land, Sea or Air?	
2.	In which environment will the Platform or Equipment be stored, handled or transported?	
3.	Will other environments (Land, Sea or Air) or platforms/equipment/systems containing or loaded with Ordnance Munitions or Explosives be affected by the operation of your platform, equipment, system or service?	
4.	Does your platform, equipment or system contain Ordnance, Munitions or Explosives?	
5.	Does your platform, equipment or system involve Nuclear Propulsion or Nuclear Weapons?	
6.	Does your platform, equipment or system contain any sources of ionising radiation?	
7.	Does your platform, equipment or system emit non-ionising radiation?	
8.	Will the procurement strategy involve Public Private Partnership arrangements?	
9.	Will the acquisition strategy require Commercial Off The Shelf purchases?	
10.	Which of the single services is intended to be the primary user of your platform, equipment, system or service?	
11.	Will the platform, equipment or system be tested on military ranges?	
12.	Will the platform, equipment or system contain Safety Related Programmable Systems (ie elements implemented in software or custom hardware whose function or behaviour affects safety)?	

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Form SMP01/F/02 - Register of Stakeholder Requirements and Information			
Project Title			
IPT			
Completed by:		Date:	
Reviewed by:		Date:	
Life Cycle Stage (please circle) Assessment/Demonstration/Manufacture/In-Service/Disposal			
Mandatory Consultees: (eg EEC, Equipment User, Subject Matter Experts, DE&S, ASEG, other IPTs involved in any sub-systems of the project, other IPTs involved with systems, projects or systems platforms with which the system/project will be closely associated) (insert more rows as required)			
Information available			
Stakeholder organisation:		Contact name:	
Contact address, telephone, fax, email:			
Requirements or concerns			
Information available			
Stakeholder organisation:		Contact name:	
Contact address, telephone, fax, email:			
Requirements or concerns			
Information available			
Other Stakeholders (insert more rows as required):			
Stakeholder organisation:		Contact name:	
Contact address, telephone, fax, email:			
Requirements or concerns			
Information available			

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Form SMP01/F/03 - Register of Safety Legislation and Other Significant Requirements				
Project Title				Page ..... of .....
IPT				
Completed by:		Date:		
Reviewed by:		Date:		
Summary of Relevant Legislation and Requirements:				
Name of legislation/policy/standard				
Reference No.				
Enforcing Agency				
Relevance to project				
Life Cycle Stage(s) (please circle)	Assessment/Demonstration/Manufacture/In-Service/Disposal			
Country where relevant				
Compliance Requirements				
Compliance Monitoring Indicators <sup>1</sup>	Indicator:			
	Frequency:			
Relevant Procedures or Further Information Sources				

<sup>1</sup> Indicators can include measurement of key parameters, the existence of key documentation, the presence/absence of controls

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**0 SHOWING CONFORMANCE**

**0.1 Options**

0.1.1 There are four options to demonstrate conformance when applying this system procedure:

- a. Follow the defined system procedure using the recommended guidance and tools, including allowed variations and options.
- b. Use an equivalent process and tool set generated elsewhere and document evidence of procedural equivalence.
- c. Use a bespoke process and tool set for the project and document how the bespoke procedure achieves the objectives defined for this system procedure.
- d. Where the procedure is considered to be not relevant, document the basis for this decision.

**1 INTRODUCTION**

1.1.1 The key elements for the effective management and delivery of safety are co-ordination, agreement and proper response by those authorities with responsibilities for the equipment. The function of the Project Safety Committee (PSC) is to provide a forum through which all those with safety responsibilities can ensure effective co-ordination on safety issues, and make decisions after consultation of those with relevant knowledge.

1.1.2 The MOD Project Safety Committee may be supported by sub-committees or Working Groups (WGs) to address particular Safety issues with the appropriate level of subject matter expertise and defined Terms of Reference.

1.1.3 Although Contractors should be members of the MOD Project Safety Committee, they may also need to form and chair their own Safety Committee. Typically this might be necessary on more complex projects where there are multiple sub-contractors. MOD should be represented on the Contractor's Safety Committee to ensure that there is an adequate understanding of the in-service environment and the user's needs. If there are both MOD and Contractor Safety Committees, then they must each have clear Terms of Reference and their interrelationship must be well defined.

1.1.4 A **Safety Committee** is defined in Def Stan 00-56 Issue 4 as:

*“A group of stakeholders that exercises, oversees, reviews and endorses safety management and safety engineering activities.”*

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1.1.5 The (Project) Safety Committee is sometimes known as the (Project) Safety Panel, but throughout the POSMS, and this procedure SMP02 in particular, the term “Project Safety Committee” and abbreviation “PSC” are used.

**2 PROCEDURE OBJECTIVES**

2.1.1 The Project Safety Committee brings together those with Safety Management responsibilities and other stakeholders with relevant specific knowledge or Subject Matter Expertise. It therefore:

- a. Provides a forum through which all those with safety responsibilities can ensure effective co-ordination on safety issues;
- b. Provides access for decision makers to all those with relevant knowledge;
- c. Provides competent oversight of the Safety Case during its development and upkeep;
- d. Provides, through records of its meetings, an audit trail showing that suitable advice has been sought and that Safety Management decisions were well founded.

**3 RESPONSIBILITIES**

**3.1 Accountability**

3.1.1 The IPTL is accountable for the completion of this procedure.

**3.2 Procedure Management**

3.2.1 It is the responsibility of the IPT Leader to establish, chair and ensure the correct functioning of the PSC. This includes making sure that the correct authorities are members of the PSC and that it meets with suitable frequency, given the state of the Safety programme.

3.2.2 The IPT Leader may appoint another competent member of the MOD team to chair the PSC. In this case, this responsibility for that individual should be formally recorded through a Letter of Delegation or Terms of Reference.

**3.3 Procedure Completion**

3.3.1 IPTs will complete the procedure, in conjunction with advice and information from members of the PSC.

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**4 WHEN**

**4.1 Formation**

4.1.1 The PSC should be established during the Concept phase of a project by the Equipment Capability Customer (ECC), through the Capability Working Group, in conjunction with the relevant IPTL, to set out the safety requirements for the equipment.

**4.2 Meetings**

4.2.1 The required frequency of PSC meetings depends on various factors including the stage of the project, the complexity of the system and whether the PSC is supported by Working Groups or has complete responsibility. Meetings will be required at greater frequency during periods of significant review and decision making, typically when Project milestones are approaching.

4.2.2 PSC meetings may occur less frequently during periods of stability, such as during the in-service phase, when fewer safety decisions are necessary. However, the PSC still has an important duty to provide oversight of the Safety Case and ensure that it remains valid and monitoring safety performance. This will include considering whether the system or its usage is changing, and seeking counter-evidence that shows that the predicted level of Safety performance is not being achieved in practice.

**5 REQUIRED INPUTS**

5.1.1 The Procedure may use the following reference inputs, as available:

- a. Outputs from Procedure SMP01 – Safety Initiation;
- b. Documents to be reviewed such as:
  - i. Project Safety Plan;
  - ii. ISA Audit Plan (if appointed);
  - iii. ISA Audit Report (if appointed);
  - iv. Other Safety Audit Plans (eg self or Peer audit);
  - v. Safety Audit Report);
  - vi. Hazard Log Report;
  - vii. Safety Requirements;
  - viii. Safety Assessment Report;
  - ix. Safety Case Report.
- c. AOF Functional Competencies for System Safety Management (SYSSAF 1);

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d. Records of previous meetings of the Safety Committee.

**6 REQUIRED OUTPUTS**

6.1.1 The Outputs of the procedure will comprise:

- a. Established Safety Committee Membership;
- b. Defined Terms of Reference for the Safety Committee (see **Guidance Sheet SMP02/G/01** – Examples Terms of Reference for Project Safety Committee);
- c. Records of Safety Committee meetings, including advice given and actions agreed;
- d. The advice given by members of the Safety Committee should include recommendations on whether a reviewed document (eg Safety Management Plan or Safety Case Report) should be authorised by the IPT Leader. If authorisation is not recommended, then the reasons should be recorded.

**7 DESCRIPTION**

**7.1 Membership**

7.1.1 The Safety Committee should include representatives, as appropriate, from the following areas:

- a. The IPT (including the Project Safety Manager, and other technical, contracts and finance officers as required);
- b. Integrated Logistics Support (ILS) teams;
- c. Equipment Support Manager (ESM)/Warship Project Manager (WPM); Engineering Authority (EA);
- d. Capability Manager ( Equipment Capability Customer );
- e. User representatives (Equipment User);
- f. Trials team;
- g. Maintenance specialists;
- h. Training Authorities;
- i. Prime contractor;

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- j. Design Authority;
- k. Independent Safety Auditor (if appointed);
- l. Specialist advisors (eg from Dstl, MOD, certification authority or industry safety consultants);
- m. Representatives of the lead Safety Management Office and/or ASEG.
  
- 7.1.2 These may include contractors, consultants, Subject Matter Experts, DS&C, DS&E, operators, users and maintainers of the equipment. These may also include Reliability and Quality Managers, Other Government Departments (OGDs) or representatives of other nation states governments or defence departments.
- 7.1.3 For further guidance on Safety Committee membership has been provided in **Guidance Sheet SMP02/G/01** - Examples Terms of Reference for Project Safety Committee. Further advice is available from the FSMOs.
  
- 7.2 Chair**
- 7.2.1 The IPT Leader, who will hold a Letter of Delegation (LOD) from CDM, should chair the Committee(s). Annex B of the LOD will detail the authority for the IPTL to carry out the safety and environmental management tasks on that programme.
- 7.2.2 The IPT Leader may appoint another competent member of the MOD team to chair the Project Safety Committee. In this case, this responsibility for that individual should be formally recorded through a Letter of Delegation or Terms of Reference.
  
- 7.3 Meeting Frequency and Mechanisms**
- 7.3.1 The PSC may meet regularly as a body, or its work may be included as a permanent item in another forum (in this instance care should be taken that all relevant parties are included), or simply through written communications. The key principles are to ensure that all relevant authorities are consulted, actions are agreed and properly allocated, and a record is kept of proceedings. A PSC can either be established for a single equipment, or a family of variants of an equipment.
- 7.3.2 Smaller projects may choose to integrate the Safety Committee activities with other meetings. As a minimum the discussion of safety issues should remain as a unique item on meeting agendas.
  
- 7.4 Working Level Support**
- 7.4.1 Depending on the complexity of the Project, the IPTL may establish one or more Working Groups (WGs) that support the PSC by assessing hazards or reviewing the integrity of specific systems. Integrity WGs could consider structure, propulsion or other electrical or mechanical systems, reporting significant issues to the PSC.

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<b>7.5</b>	<b>Safety Management Committee (SMC)</b>
7.5.1	Where a number of similar equipments are under management in a project team, as in a cluster IPT, consideration should be given to establishing a top level SMC to set out and agree the safety management policy and strategy for those projects. The strategy would detail the formation of PSCs for individual equipments, or groups of similar equipments eg Radio Systems, or Support Vehicles rather than a type of radio or vehicle.
7.5.2	The SMC should monitor and control the activities of the individual PSCs, which would operate to their own Safety Management Plans. Structures can be tailored to suit individual circumstances. Terms of Reference, including membership, for a SMC would be similar to that of a PSC. The safety management policy and strategy for those projects should be recorded in a Safety Management System document, similar to a Safety Management Plan.
<b>8</b>	<b>RECORDS AND PROJECT DOCUMENTATION</b>
8.1.1	The records from this Procedure will consist of Project Safety Committee meeting minutes which should record the following: <ul style="list-style-type: none"> <li>a. Those present;</li> <li>b. The discussions;</li> <li>c. Advice given;</li> <li>d. Decisions made;</li> <li>e. Recommendations to those with delegated authority for Safety management;</li> <li>f. Actions agreed.</li> </ul>
8.1.2	Where relevant, the outputs from this procedure should feed into the following: <ul style="list-style-type: none"> <li>a. SRD (System Requirements Document) – for any specific Safety requirements;</li> <li>b. CSA (Customer Supplier Agreement) – to document agreements on Safety information to be delivered by the IPT;</li> <li>c. TLMP (Through Life Management Plan);</li> <li>d. Safety elements of Initial Gate and Main Gate submissions.</li> </ul>

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<b>9</b>	<b>RECOMMENDED TOOLS AND FORMS</b>
<b>9.1</b>	<b>Terms of Reference</b>
9.1.1	Guidance Sheet <b>SMP02/G/01</b> contains example Terms of Reference for Project Safety Committee.
<b>10</b>	<b>GUIDANCE</b>
<b>10.1</b>	<b>General Guidance</b>
10.1.1	Where it is considered beneficial, a combined Committee may be established for the Safety and Environmental Management activities. It should be ensured that the programmes are aligned as far as possible and that data is shared where relevant.
10.1.2	It is suggested that where there are separate Safety and Environmental Committees; these meet consecutively concurrently over a morning and afternoon – with membership and specialists attending as appropriate to each.
10.1.3	The Project Safety Committee may cover groups of similar projects within an IPT where common activities are required, although separate Committees are envisaged for very large, high risk or diverse projects within an IPT.
10.1.4	The Project Safety Committee may meet regularly as a body, or its work may be included as a permanent item in another forum (in this instance care should be taken that all relevant parties are included), or simply through written communications. This last option is less desirable because there is no opportunity for direct interaction.
10.1.5	The Project Safety Committee is different from the OME Safety Review Panel who are independent of the OME System IPT and will have delegated authority to endorse the OME Safety Case Report. The OME Safety Review Panel are thus part of the Regulatory/Assurance function rather than having responsibility for the active management of Safety through the Acquisition life cycle.
<b>10.2</b>	<b>Project Safety Committee Authority and Competence</b>
10.2.1	The Chairman of the Project Safety Committee should hold a Letter of Delegation detailing the authority for carrying out the safety management tasks on that programme.
10.2.2	The Project Safety Committee exists to provide information and specialist advice to those who have specific responsibility for Safety Management on an Acquisition Project, so that they can reach informed decisions. The IPT Leader with Safety delegation from CDM is required to seek and consider relevant advice through the Project Safety Committee, but remains the decision maker.
10.2.3	Whilst not all members of the Project Safety Committee need have specific competence and experience in Safety Management, it is essential that some

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Committee members do have this competence and are listened to. Those with Safety Management competence would typically include the Project Safety Manager, the ISA (if appointed) and the IPT Leader.

10.2.4 The Project Safety Manager should have attained Functional Competence SysSaf 1 level 3 as a minimum and the IPT Leader, level 1.

**10.3 Review and Agreement of Safety Documents**

10.3.1 The role of the Safety Committee includes reviewing Safety documents and advising the IPT Leader on their suitability. Agreement that the document is suitable can be signified in various ways and the IPT Leader should define which is required. Methods for recording the review and its findings could include:

- a. Formal sign off of the document by all members of the Project Safety Committee;
- b. A recommendation, recorded in Project Safety Committee minutes, that the document is satisfactory and can be Authorised for release by the agreed signatory;

**10.4 Domain-Specific Guidance and References**

10.4.1 Additional guidance on Project Safety Committees is contained in the following references:

- a. Land Systems: JSP 454 Issue 4 Part 2:
  - i. Policy (3.3.2)
  - Responsibilities (3.3.2.2)
  - Membership (3.3.2.4) TORs at Annex A
- b. Ship Safety Management: (JSP 430 Issue 3 Part 1):
  - ii. Responsibilities
- c. Airworthiness: (JSP 553 1st Edition):
  - i. Policy (2.62 MOD Project Safety Panel)
  - ii. Responsibilities (2.64)
  - iii. Membership (2.62)
- d. Ordnance, Munitions & Explosives (OME): (JSP 520 Issue 2.0):
  - i. Policy and Legislative Objectives Section 4
  - ii. OME Safety Assurance Activities Section 6
- e. Nuclear Propulsion (JSP 518 Issue 1.2):
  - i. Policy (A102)

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**10.5 Guidance for Different Acquisition Strategies**

10.5.1 The requirements for Project Safety Committee do not change for Acquisition conducted through intergovernmental agreements, OCCAR, multilateral or collaborative programmes. The Terms of Reference and membership of the Safety Committee may be affected by the different authorities involved and the scope of the IPT Leader’s delegated authority.

**10.6 Warnings and Potential Project Risks**

10.6.1 If the Safety Committee is not established early in the Acquisition life cycle, then some of the stakeholders involved may not be identified and their needs may not be addressed adequately in the development of the Safety Requirements or the production of the Safety Plan. This could also occur if the Safety Committee is established with an incomplete membership.

10.6.2 If the Safety Committee do not review and approve the Safety tasks described in the Safety Plan, then the activities may be inappropriate to deliver the required levels of Safety performance and Safety Assurance.

10.6.3 If the Safety Committee do not review and approve the Safety Management System described in the Safety Plan, then they may not identify areas of disagreement concerning responsibilities for Safety.

10.6.4 If the Safety Committee does not meet with sufficient frequency, then they may not identify in a timely manner, any problems with the Safety programme. This would result in impacts on Project time and cost.

10.6.5 If the Safety Committee attempts to control the detail design solutions, rather than relying on the Contractor’s Project Safety Committee and design function, then MOD will take responsibility from the designer. MOD staff will be represented on the Contractor’s PSC and should exercise influence at that forum and through setting appropriate requirements.

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Guidance Sheet SMP02/G/01 – Example Terms of Reference for Project Safety Committee	
<b>a.</b>	<b>Terms of Reference for –</b>
<b>b.</b>	<b>Purpose:</b>  To provide a forum for monitoring and co-ordinating all safety management and risk reduction activities associated with the project to ensure effective levels of safety and provide an appraisal of the Safety Case. The Safety Committee reports to the IPTL or in a cluster IPT to the Safety Management Committee.
<b>c.</b>	<b>Tasks:</b> <ul style="list-style-type: none"> <li>● To set and keep under review the project’s safety policy and strategy.</li> <li>● To set and keep under review the project’s safety targets and objectives.</li> <li>● To define the System boundaries for Safety responsibility.</li> <li>● To advise the Chairperson of the Safety Committee on the safety responsibilities for each authority associated with the project.</li> <li>● To advise the Chairperson of the Safety Committee on the standards, statutory regulations and any restrictions with which the projects must comply.</li> <li>● To review, monitor, classify and allocate new equipment hazards as they are identified.</li> <li>● To carry out reviews of the project’s Safety Case and progress on achieving safety targets, to a predetermined programme, issuing the results to the Delegated Authority.</li> <li>● To implement any control measures that are deemed necessary to reduce identified risks to ALARP.</li> <li>● To ensure proper and timely availability of training and issue of documentation.</li> <li>● To carry out audits of the project’s Safety Case to ensure that it is comprehensive. The audit findings should be reported to the Delegated Authority.</li> <li>● To operate a system for reviewing and monitoring safety performance and maintain the Safety Case.</li> </ul>

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- d. Membership:**
- IPT responsible for the procurement aspects of the project<sup>1</sup>
  - Equipment Capability Customer
  - Safety Officer (if appointed)
  - Design Authority
  - IPT responsible for the support aspects of the project<sup>1</sup>
  - Equipment User
  - Training Authority
  - User
  - Maintainer
  - Maintenance Authority
  - Specialist Advisors (if required) eg
    - LSSO
    - DOSG
    - LAIT
    - Independent Safety Auditor
    - Interfacing IPTs
    - Technical Specialists

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<sup>1</sup> Depending on the stage in the life of the project either the Procurement Authority or the Support Authority will be the Delegated Authority and will therefore generally provide the Chairperson of the Safety Panel. Alternatively Equipment user could provide the Chairperson.

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**0 SHOWING CONFORMANCE**

**0.1 Options**

0.1.1 There are four options to demonstrate conformance when applying this system procedure:

- a. Follow the defined system procedure using the recommended guidance and tools, including allowed variations and options.
- b. Use an equivalent process and tool set generated elsewhere and document evidence of procedural equivalence.
- c. Use a bespoke process and tool set for the project and document how the bespoke procedure achieves the objectives defined for this system procedure.
- d. Where the procedure is considered to be not relevant, document the basis for this decision.

**1 INTRODUCTION**

1.1.1 The objectives of a Project Safety Programme are twofold:

- a. To ensure that the Safety performance of the system is acceptable throughout its life;
- b. To provide and maintain adequate assurance information that this is being achieved.

1.1.2 These objectives can only be realised by following a co-ordinated and structured approach to Safety throughout the system life cycle. This encompasses setting appropriate Requirements as well conducting Risk Management as an integral part of system development.

1.1.3 Separate Plans are required to be produced both by the MOD Project and by the Contractor. Each Plan defines the Safety activities to be conducted by that organisation, so they are closely related to each other. The programmes that they contain will also be linked to activities of system development, trials and any safety approvals required. Similarly, the ISA's Audit Plan will also be linked to these activities.

1.1.4 This procedure is concerned with the Safety Management Plan (SMP) for the MOD Project rather than plans produced by the Contractor or ISA.

1.1.5 A **Safety Management Plan** is defined in Def Stan 00-56 Issue 4 as:

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*“A document that defines the strategy for addressing safety and documents the Safety Management System for a specific project.”*

1.1.6 The **Safety Programme** is defined in Def Stan 00-56 Issue 4 as:

*“The part of the Safety Management Plan that documents safety timescales, milestones and other date-related information.”*

**2 PROCEDURE OBJECTIVES**

2.1.1 The SMP details the MOD’s Safety Management Activities for the Project and therefore:

- a. Ensures that Safety responsibilities are recognised and properly allocated;
- b. Defines the Safety Programme timescales and so supports the timely completion of tasks and identification of any slippage.

**3 RESPONSIBILITIES**

**3.1 Accountability**

3.1.1 The IPTL is accountable for the completion of this procedure.

**3.2 Procedure Management**

3.2.1 The IPTL may delegate the management of this procedure to a member (Safety Manager) or members of the IPT.

**3.3 Procedure Completion**

3.3.1 The Project Safety Committee (PSC) is responsible for drafting and endorsing the SMP and agreeing the safety targets, requirements and acceptance criteria. It is important that all organisations with Safety responsibilities described in the SMP should review the SMP described and agree that it is accurate.

3.3.2 The SMP endorsed by the PSC shall be accepted formally by the MOD delegated Authorities for Procurement, Support and Operation.

**4 WHEN**

**4.1 Initial Production**

4.1.1 The SMP should be produced on behalf of the IPT Leader at the earliest stage of the project, eg at the beginning of the Concept stage and be updated as the project progresses through the acquisition stages.

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**4.2 Review, Development and Acceptance**

4.2.1 It is recommended that the SMP should be reviewed to a predetermined project programme particularly if there are major changes to the programme. It must accurately record arrangements and should be reviewed at each meeting of the PSC, or at least annually.

4.2.2 The SMP endorsed by the PSC shall be accepted formally by the MOD delegated Authorities for Procurement, Support and Operation. When any of the signatories change, the SMP shall be re-issued and formally accepted again by these delegated Authorities.

4.2.3 The SMP evolves as the project matures and additional information becomes available or decisions are made. Early iterations will only outline broad safety strategies and goals; later iterations will become more definitive. This will enable important safety management tasks to be carried out during the subsequent acquisition stages.

**5 REQUIRED inputs**

5.1.1 This procedure for Safety Planning requires inputs from:

- a. Outputs from Procedure SMP01 – Safety Initiation;
- b. Outputs from Procedure SMP02 – Safety Committee.

5.1.2 The SMP must be integrated with other management plans produced by the IPT Leader throughout the Acquisition Cycle to ensure its effectiveness. It shall also be of sufficient detail to stand alone for all safety planning activities.

5.1.3 The development of the SMP will be based on the following:

- a. Overall Project Programme;
- b. URD and SRD;
- c. TLMP;
- d. Existing descriptions of the Safety Management Arrangements for organisations involved in the Project (eg IPT SMS descriptions).

**6 REQUIRED OUTPUTS**

**6.1 Safety Plan**

6.1.1 The SMP defines the strategy for addressing safety and interprets the Safety Management System for a specific project. It also contains the Safety programme which documents safety timescales, milestones and other date-related information.

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6.1.2	The SMP may be based on Guidance Sheet SMP03/G/01 – Template for Project Safety Management Plan.
<b>7</b>	<b>Description</b>
7.1.1	The MOD Project SMP forms an essential element of the Through Life Management Plan (TLMP). Each project requires a SMP explaining how the IPT Leader will demonstrate that the system will be tolerably safe throughout its life.
7.1.2	The publication and agreement of the arrangements detailed in the SMP should be the mechanism through which the MOD through-life safety management of the equipment is established. The SMP is the formal record of the way the MOD manages safety for a Project.
<b>7.2</b>	<b>Scope</b>
7.2.1	The SMP must consider all aspects of equipment safety including, but not restricted to; <ul style="list-style-type: none"> <li>a. General Equipment Safety;</li> <li>b. System specific requirements ie. Airworthiness, Ship Key Hazards etc;</li> <li>c. Occupational Safety ie. Manual Handling, Packaging, Transport and Storage, Control of Substances Hazardous to Health etc;</li> <li>d. Safety of Operation;</li> <li>e. Infrastructure interfaces;</li> <li>f. Maintenance;</li> <li>g. Training;</li> <li>h. Disposal.</li> </ul>
7.2.2	The SMP must be detailed for the current stage of the Acquisition cycle but must also define a workable Safety strategy for all the remaining stages, including Disposal. This Safety strategy covers both the MOD’s input to Safety engineering and Safety Assurance aspects, including Safety Case development and Safety Approvals.
<b>7.3</b>	<b>Content</b>
7.3.1	The Project SMP should contain the following information:- <ul style="list-style-type: none"> <li>a. Outline Description. Description of the equipment, clearly defining the purpose and capability expected (and eventually achieved) of the project. Clearly identify the range, or variants, of the equipment covered, its purpose, operating</li> </ul>

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cycle and environment and defining interfaces with other equipments and levels of competence expected of the operator(s).

- b. Safety Management System. Details of the Safety Management System including its aims and objectives, the managerial and technical tasks to be undertaken and the organisation responsible for implementing them;
- c. Responsibilities and Resources. The management structure, responsibilities, resources and interfaces with contractors necessary for the implementation of the safety programme. This should include the roles and details of all personnel involved throughout the life of the project. It should include the IPT Leader, Project Safety Officer, ECC, Maintainers, Users and the Project PSC. The reporting chain should be identified within the plan. A RACI Chart should be used to define the responsibilities and accountabilities of the authorities involved in the implementation of the MOD Project Safety Programme;
- d. Audit. Details of the audit arrangements for the project, including internal and independent audits;
- e. Requirements, Objectives, Targets and Acceptance. A definition of the safety requirements, objectives, targets, regulation, licensing and certification requirements and acceptance criteria for the project. Details of statutory safety standards, legislation and regulations, and any restrictions or exemptions that may apply. The means and criteria by which the requirements are to be demonstrated and accepted are to be clearly defined (these elements will form part of the technical requirement for the project and will become deliverables under the contract);
- f. Scope of the Safety Case. Clearly identify the range and variants, of the equipment covered, its purpose, operating cycle and environment to be covered eg. the operating envelope;
- g. Safety Case Strategy. The definition of the strategy to be followed for the Safety Assessment. This should give a full breakdown of all the techniques to be used to identify, analyse, assess and control hazards;
- h. Safety Programme. The programme of work that identifies and schedules the tasks contained in the previous paragraphs. This programme should be linked to key stages in the TLMP.

7.3.2 For further guidance an outline Project SMP has been provided in **Guidance Sheet SMP03/G/01 - Template for Project Safety Management Plan**. Further advice is available from the FSMOs.

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<b>8</b>	<b>RECORDS and project documentation</b>	<p>8.1.1 Where relevant, the outputs from this procedure should feed into the following:</p> <ul style="list-style-type: none"> <li>a. SRD (System Requirements Document) – for any specific Safety requirements;</li> <li>b. CSA (Customer Supplier Agreement) – to document agreements on Safety information to be delivered by the IPT;</li> <li>c. TLMP (Through Life Management Plan);</li> <li>d. Safety elements of Initial Gate and Main Gate submissions.</li> </ul> <p>8.1.2 PSC meeting minutes should record the review of the SMP and any decisions made regarding its amendment and up-issue.</p>
<b>9</b>	<b>RECOMMENDED TOOLS and forms</b>	
<b>9.1</b>	<b>General SMP Template</b>	
9.1.1	<b>Guidance Sheet SMP03/G/01</b> is a general template for a MOD Project SMP. It should not be confused with the requirement of Defence Standard 00-56 for the contractor to produce a Safety Plan.	
9.1.2	Devising a general plan is not practical: each plan must be tailored to its project and goals.	
<b>9.2</b>	<b>RACI Chart</b>	
9.2.1	<b>Guidance Sheet SMP03/G/02 - RACI Chart</b> , is an example of a RACI Chart which might be used as part of a Project SMP to define the responsibilities and accountabilities of the authorities involved in the implementation of the MOD Project Safety Programme.	
<b>10</b>	<b>Guidance</b>	
<b>10.1</b>	<b>General Guidance</b>	
10.1.1	Where it is considered beneficial, a combined Plan may be produced for the Safety and Environmental Management activities. It should be ensured that the programmes are aligned as far as possible and that data is shared where relevant.	
10.1.2	The SMP may cover groups of similar projects within an IPT where common activities are required, although separate plans are envisaged for very large, high risk or diverse projects within an IPT.	

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**10.2 Alignment with Environment**

10.2.1 The key alignment opportunity in SMP03 is to plan assessment studies which can meet both safety and environmental evaluation requirements. Where this is not possible, the SMP should define mechanisms to ensure that results of safety assessments are reviewed for environmental implications and vice versa.

**10.3 Domain-Specific Guidance and References**

10.3.1 Additional guidance on Project Safety Plans is contained in the following references:

- a. Land Systems: JSP 454 Issue 4:
  - i. Policy Description, purpose, agreement and review.
- b. Ship Safety Management: (JSP 430 Issue 3):
  - i. General: Part 1 Section 8.1; Safety Plan (8.2)
- c. Airworthiness: (JSP 553 1st Edition):
  - i. Guidance notes: Annex P; Safety Plan (2.42)(4.5)(Annex P); Good Practice (Annex P); Plan updates (Annex P)
- d. Ordnance, Munitions & Explosives (OME): (JSP 520 Issue 2.0):
  - i. Policy ; Safety Plan

**10.4 Guidance for Different Acquisition Strategies**

10.4.1 The requirements for safety and environmental performance do not change for Acquisition conducted through intergovernmental agreements, OCCAR, multilateral or collaborative programmes. It is MOD policy that the same standards are met, and that assurance that these standards have been met can be demonstrated. New methods of procurement often mean that the supplier takes the lead in assuring compliance for the project, often directing trials and testing in-house. But the UK version must still be supported by an IPT managed Safety Management Plan and Safety Case(s), in the appropriate format, to meet the UK policy requirement for acceptance. This is even if much of the information to populate these documents comes from the supplier, or other customers' programmes of trials and testing, provided it is correctly interpreted according to UK and EU policy and law. MOD must maintain a suitable body of 'evidence' which it can use to legally defend itself, and its management decisions.

**10.5 Warnings and Potential Project Risks**

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- 10.5.1 The SMP is the principal mechanism for managing Project Risks due to the Safety activities. If the Plan is not accurate or is not kept up to date, then the effects of delays in the Safety activities or changing Project timescales may not be recognised and managed.
- 10.5.2 If the SMP is not sufficiently detailed, then required Safety activities may not be identified and planned into the programme. This may have adverse effects on the Project time and cost once the missing activities are recognised and performed. If the requisite activities are not undertaken at all, then either the Safety performance may not be adequate, or the necessary Safety assurance evidence may not be generated. The former would lead to avoidable accidents and the latter to an inadequate Safety Case that might prevent the system being accepted into service.
- 10.5.3 If the SMP is not reviewed and endorsed by the PSC, then it is possible that the Project SMS described in the Plan may not be an accurate reflection of the Safety responsibilities as understood by other parties. The programme of activities contained in the SMP might not be achievable if resources required are not available at the times assumed.

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<b>Guidance Sheet SMP03/G/01 – Template for Project Safety Management Plan</b>	
<b>1.</b>	<b>TITLE</b>
1.1	Title of equipment or system to be procured with Requirement reference number.
<b>2.</b>	<b>DESCRIPTION</b>
2.1	A brief description of the project including its purpose and the environment it is to operate in. The scope of the project and interfaces with other equipment are also to be identified.
<b>3.</b>	<b>LEAD SAFETY MANAGEMENT OFFICE</b>
3.1	Either the SSMO, ASG/DMSD, DOSG, or the LSSO.
NB ASG/DMSD deal with all equipment that operates in the air. The SSMO deal with all maritime platforms and equipment that forms an integral part of ships and floating structures. The LSSO deal with equipment that operates in the Land Systems environment. In cases where there is no natural alignment with a particular Safety Management Office then consult one of the safety offices for advice.	
<b>4.</b>	<b>INVOLVEMENT OF SPECIALIST SAFETY ADVISORS</b>
4.1	List any specialist advisors (including FSMOs) who need to be involved in the programme and send them a copy of this plan where required.
<b>5.</b>	<b>PROJECT SAFETY MANAGEMENT SYSTEM</b>
5.1	A description of the SMS within the MOD project team to include: <ul style="list-style-type: none"> <li>a. The aims and objectives of the safety management system;</li> <li>b. Technical tasks to be undertaken and organisation responsible for implementing them;</li> <li>c. Identification of project staff with responsibility for carrying out safety tasks. Include those who are to be issued with letters of delegation;</li> <li>d. Cross refer to any relevant project safety documents or reports;</li> <li>e. A regime for internal or independent audits of the safety management system;</li> <li>f. Details of the project safety panel;</li> <li>g. Responsibilities, Resources and Interfaces with MOD, contractor and specialist advisors;</li> <li>h. Safety reviews, feedback and reporting procedures;</li> <li>i. Transfer arrangements;</li> <li>j. Design changes;</li> <li>k. Contractor's trials.</li> </ul>

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<b>6.</b>	<b>SAFETY REQUIREMENTS</b>
a.	Safety requirements arising from legislation;
b.	MOD Certification requirements;
c.	Acceptance criteria;
d.	Safety requirements from the Requirement or ;
e.	Safety targets;
f.	Safety related standards to be applied eg British Standards, Defence Standards, international standards or overseas standards.
<b>7.</b>	<b>PROGRAMME OF WORK</b>
7.1	Identify the tasks that will enable the safety requirements to be met and develop this into a schedule of work on a Gantt or PERT chart link to key stages in the TLMP.
<b>8.</b>	<b>SAFETY CASE STRATEGY</b>
8.1	This strategy should support the programme of work above. It should give consideration to the types of analyses and testing to be carried out. It should define the scope of work of the safety case and interfaces with associated equipment safety cases.
<b>9.</b>	<b>APPROVAL</b>
9.1	This plan should be approved by person with delegated authority.
<b>10.</b>	<b>DISTRIBUTION</b>
10.1	Plan to be distributed to the management area with responsibility for in-service support. The plan should also be distributed to IPT Leaders procuring equipment with which the project interfaces and or interacts.

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**Guidance Sheet SMP03/G/02 – RACI Chart**

The SMP should contain a RACI Chart to define which authority is Responsible, Accountable, Consulted or Informed for each of the activities in the Safety Programme. A simple example is given below:

Activity	IPT Leader	Project Safety Manager	ISA	Contractor Project Safety Engineer	Equipment User
Safety Case Preparation	A	R	I	R	I
Safety Case Endorsement	A	I	R	I	I
Hazard Log Administration	A	I	-	R	-
Safety Requirements Preparation	A	R	-	R	C

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<b>0</b>	<b>SHOWING CONFORMANCE</b>
<b>0.1</b>	<b>Options</b>
0.1.1	<p>There are four options to demonstrate conformance when applying this system procedure:</p> <ol style="list-style-type: none"> <li>a. Follow the defined system procedure using the recommended guidance and tools, including allowed variations and options.</li> <li>b. Use an equivalent process and tool set generated elsewhere and document evidence of procedural equivalence.</li> <li>c. Use a bespoke process and tool set for the project and document how the bespoke procedure achieves the objectives defined for this system procedure.</li> <li>d. Where the procedure is considered to be not relevant, document the basis for this decision.</li> </ol>

<b>1</b>	<b>INTRODUCTION</b>
1.1.1	<p><b>Hazard Identification</b> is defined in Def Stan 00-56 Issue 4 as:</p> <p><i>“The process of identifying and listing the hazards and accidents associated with a system.”</i></p>
1.1.2	<p><b>Hazard Analysis</b> is defined in Def Stan 00-56 Issue 4 as:</p> <p><i>“The process of describing in detail the hazards and accidents associated with a system, and defining accident sequences.”</i></p>
1.1.3	<p>Preliminary Hazard Identification and Analysis (PHI&amp;A) is intended to assist projects in determining the scope of the safety activities and requirements. It identifies the main hazards likely to arise from the capability and functionality being provided. It is carried out as early as possible in the project life cycle, providing an important early input to setting Safety requirements and refining the Project Safety Plan.</p>
1.1.4	<p>PHI&amp;A seeks to answer, at an early stage of the project, the question:</p> <p><i>“What Hazards and Accidents might affect this system and how could they happen?”</i></p>
1.1.5	<p>PHI&amp;A has a separate procedure to SMP05 – Hazard Identification and Analysis. This is both to recognise that different techniques may be required, basing the work on function and capability rather than design solution, and also to emphasise the importance of high-level examination at an early stage.</p>

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**2 PROCEDURE OBJECTIVES**

2.1.1 The objective of the PHI&A is to identify, as early as possible, the main Hazards and Accidents that may arise during the life of the system. It provides input to:

- a. Identifying any critical areas of Safety risk inherent in the User’s requirement, as input to Initial Gate submission.
- b. Providing the basis for the Safety Case Report for Initial Gate.
- c. Scoping the subsequent Safety activities required in the Safety Plan. A successful PHI&A will help to gauge the proportionate effort that is likely to be required to produce an effective Safety Case, proportionate to risks.
- d. Selecting or eliminating options for subsequent Assessment
- e. Setting the initial Safety requirements and criteria in the Outline SRD,
- f. Provides the starting point for subsequent Hazard Analysis (see Procedure SMP05 – Hazard Identification and Analysis).
- g. Initiate Hazard Log (see Procedure SMP11-Hazard Log).

**3 RESPONSIBILITIES**

**3.1 Accountability**

3.1.1 The IPTL is accountable for the completion of this procedure.

**3.2 Procedure Management**

3.2.1 The IPTL may delegate the management of this procedure to a member (Safety Manager) or members of the IPT.

**3.3 Procedure Completion**

3.3.1 The Project Safety Manager will be responsible for the completion of the procedure. However, for complex projects the IPT may choose to commission advisors or contractors to complete the procedure. In either case, PSC members and other stakeholders should be involved in providing input.

**4 WHEN**

**4.1 Initial Production**

4.1.1 PHI&A should be performed as early in the project life cycle as possible in order to obtain maximum benefit by understanding what the Hazards and Accidents are, why and how they might be realised. The PHI&A should be conducted during the Concept

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stage as an input to Initial Gate and outline SRD Production, based on the capability and concept of use defined in the URD.

**4.2 Review, Development and Acceptance**

4.2.1 In principle, PHI&A is a once-off analysis. However, in a complex project with an extended Concept Phase, the PHI&A should be reviewed if there are major changes to the requirements or options being identified.

4.2.2 The PHI&A and any updates shall be endorsed by Safety Panel, through endorsement of the Hazard Log and Safety Case Reports for Main Gate. An endorsed PHI&A shall be available as input to outline SRD development, Safety Case generation and the subsequent Hazard Analysis (in later phases). If the PHI&A is updated, management measures should ensure that these dependent activities are also updated.

**5 REQUIRED inputs**

5.1.1 This procedure for PHI&A requires inputs from:

- a. Outputs from Procedure SMP01 – Safety Initiation;
- b. Outputs from Procedure SMP02 – Safety Committee;
- c. Outputs from Procedure SMP03 – Safety Planning.

5.1.2 The PHI&A method and timing will be defined in the Project Safety Management Plan.

5.1.3 The PHI&A may use the following reference inputs, as available:

- a. URD;
- b. Hazard Checklists (eg from individual Safety Management Offices);
- c. Relevant Previous Hazard Logs/Analyses;
- d. Accident and incident history from relevant existing systems in service.

**6 REQUIRED OUTPUTS**

6.1.1 The primary outputs of the PHI&A are the initial Hazards, Accidents and Accident Sequences recorded in the Hazard Log for the project.

6.1.2 These results form part of the Safety Case body of evidence and may be recorded in a standalone report or as part of a wider report on Safety (eg Safety Assessment Report or Safety Case Report).

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**7 Description**

7.1.1 PHI&A is an important part of Risk Management, project planning and requirements definition as it helps to identify the main system hazards and helps target where more thorough analysis should be undertaken. The relationship of this activity with other Risk Management activities is illustrated below:

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graph TD
    SMP04[SMP04 Prelim Hazard ID & Analysis] --> SMP05[SMP05 Hazard ID & Analysis]
    SMP05 --> SMP06[SMP06 Risk Estimation]
    SMP06 --> SMP07[SMP07 Risk & ALARP Evaluation]
    SMP07 --> SMP08[SMP08 Risk Reduction]
    SMP08 --> SMP09[SMP09 Risk Acceptance]
    
    SMP10[SMP10 Safety Requirements] -.-> SMP04
    SMP10 -.-> SMP05
    SMP10 -.-> SMP07
    
    SMP04 --> SMP11[SMP11 Hazard Log]
    SMP05 --> SMP11
    SMP06 --> SMP11
    SMP07 --> SMP11
    SMP09 --> SMP11
    
    SMP11 --> SMP12[SMP12 Safety Case Reports]
      
```

7.1.2 Usually PHI&A is based on a structured brainstorming exercise using Hazard Analysis techniques such as SWIFT (Structured What-If Technique), supported by hazard checklists. A structured approach is necessary to minimise the possibility of missing an important hazard, and to demonstrate that a thorough and comprehensive approach has been applied.

**7.2 Method**

7.2.1 The capability and concept of use as set out in the URD must be reviewed, and potential hazards identified. This preliminary list of hazards should then be assessed for likely impact. From this, the regulatory requirements as well as any standards, with which the requirement will have to comply, and a level of tolerability is to be determined against which risks identified in the subsequent phases might be judged.

7.2.2 The form, nature and depth of the PHI&A should be proportionate to the complexity and significance of the project, considering any safety-related functionality. There are a number of Hazard Analysis/Identification techniques that may be used:

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- a. Hazard Checklist;
  - b. Accident and History Review;
  - c. Functional Failure Mode and Effects Analysis (FMEA);
  - d. Structured What If Technique (SWIFT);
  - e. Hazard and Operability Study (HAZOP).
- 7.2.3 Different approaches and techniques are more suited to different systems and no single approach is likely to be sufficient on its own. Usually a combination of complementary techniques should be used in order to maximise the proportion of hazards identified.

**8 RECORDS AND PROJECT DOCUMENTATION**

8.1.1 Where relevant, the outputs from this procedure should feed into the following:

- a. SRD (System Requirements Document) – for any specific Safety requirements;
- b. CSA (Customer Supplier Agreement) – to document agreements on Safety information to be delivered by the IPT;
- c. TLMP (Through Life Management Plan);
- d. Safety elements of Initial Gate and Main Gate submissions.

8.1.2 The Hazard Log is the primary mechanism for recording all Hazards identified through PHI&A. It is a live database or document, updated with the results of each Hazard Analysis as they become available. See Procedure SMP11 – Hazard Log, for more details.

8.1.3 The results of the PHI&A should be reported in a form which records the following:

- a. The input information used (eg. URD version, design standard);
- b. The approach adopted (eg checklist used);
- c. The people consulted;
- d. The Hazards, Accidents and Accident Sequences identified.

8.1.4 These results form part of the Safety Case body of evidence and may be recorded in a standalone report or as part of a wider report on Safety (eg Safety Assessment Report or Safety Case Report).

8.1.5 The Safety Case Report (Procedure SMP12 – Safety Case and Safety Case Report) is where the project should demonstrate the adequacy of the Hazard Analysis process

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	and the suitability of the techniques employed.
<b>9</b>	<b>RECOMMENDED TOOLS AND FORMS</b>
9.1.1	Detailed information on tools and techniques is provided in the Safety Manager's Toolkit.
<b>10</b>	<b>Guidance</b>
10.1.1	Hazard Analysis is fundamental to System Safety Management. If you do not identify a Hazard, you can take no specific action to remove it, or reduce the risk of the Accident(s) associated with it. Absence of a systematic and comprehensive PHI&A activity can thus severely undermine the Risk Evaluation process.
10.1.2	Hazards are diverse, and many different techniques are available for hazard identification and PHI&A. While some techniques have become standard for particular applications, it is not necessary or desirable to specify which approach should be adopted in particular cases. The mix of techniques should be chosen to meet the objectives as efficiently as possible given the available information and expertise.
10.1.3	PHI&A is usually a qualitative exercise based primarily on expert judgement. Most PHI&A exercises involve a group of experts, since few individuals have expertise on all hazards, and group interactions are more likely to stimulate consideration of hazards that even well-informed individuals might overlook. The techniques most suitable for group PHI&A activities are <ul style="list-style-type: none"> <li>a. Structured What If Technique (SWIFT)</li> <li>b. Hazard and Operability Study (HAZOP)</li> </ul>
10.1.4	In either case hazard checklists and history of similar systems should be available as inputs.
10.1.5	Although both the SWIFT and HAZOP methods are systematic, creative examinations by a multi-disciplinary team, they are dependent on different levels of system information. As such, the most appropriate technique should be selected for any particular system, in order that the Hazard Identification process is effective.
<b>10.2</b>	<b>Alignment with Environment</b>
10.2.1	The key alignment opportunity in SMP04 is to cross reference Environmental Features against Safety Hazards, so that common issues are identified and where possible assessed together, and to also to ensure that the potential environmental impact of a safety hazard, or a safety impact of an environmental hazard are not overlooked.
10.2.2	It is also important to plan and conduct assessment studies which can meet both safety and environmental evaluation requirements. Where this is not possible, alignment should help ensure that results of safety assessments are reviewed for environmental

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implications and vice versa.

### 10.3 Domain-Specific Guidance and References

10.3.1 Additional guidance on PHI&A is contained in the following references:

- a. Land Systems: JSP 454 Issue 4 :
  - i. Part 2 Section 6.3.4
- b. Ship Safety Management: JSP 430 Issue 3:
  - i. Part 1 Section 8 Safety Cases (8.4)
- c. Airworthiness: JSP 553 1<sup>st</sup> Edition:
  - i. Nil
- d. Ordnance, Munitions & Explosives (OME): JSP 520 Issue 2.0:
  - i. Chapter 3 Section I
  - ii. Chapter 4 Section II (0413, 0418 and 0429)
- e. Nuclear Propulsion: JSP 518 Issue 1.2:
  - i. Nil

### 10.4 Guidance for Different Acquisition Strategies

10.4.1 The requirements for PHI&A do not change for Acquisition conducted through intergovernmental agreements, OCCAR, multilateral or collaborative programmes. It is MOD policy that the same standards are met, and that assurance that these standards have been met can be demonstrated.

10.4.2 Where the project involves a mid-life update, existing history will obviously provide a major input to the process. Similarly, where the project is likely to involve COTS or MOTS solutions (including non-UK solutions) the existing history of these solutions provides a starting point. However, in all these cases there is still a need to carry out PHI&A to determine if any new Hazards are introduced by the proposed use in a UK context, through particular safety-related functionality, new interfaces, different support and usage environments, different operational employments, etc.

### 10.5 Warnings and Potential Project Risks

10.5.1 It is essential the appropriate team of experts are used in the PHI&A process, who together can provide a sound understanding of:

- a. The System description, its boundaries, together with its interactions with its Environment, including systems with which it interfaces and is dependent upon;
- b. Operational profiles, maintenance, operator competencies within a given Functional Environment;
- c. The application and limitations of the selected HAZID techniques;

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- d. The existing and/or commonly known Hazards of this or similar systems;
  - e. Validity of historical data adjusted to account for its context.
  - f. If the team contributing to the PHI&A do not contain this expertise, then it is likely that some significant hazards will be missed.
- 10.5.2 A Hazard checklist is useful for most Risk Evaluations, but should not be the only PHI&A method, except for standard installations whose hazards have been studied in more detail elsewhere.
- 10.5.3 When identifying Hazards, the scope should not be restricted to the steady-state operational scenario, but consider all aspects of the Systems Life cycle, from installation to final decommissioning and disposal, including Maintenance and Upgrades (ie. CADMID). Emergency scenarios and associated Contingency Modes of Operation should also be considered.
- 10.5.4 If the PHI&A is not carried out early enough, there is a risk that unrecognised hazards or requirements will be discovered later in the project, by which time it may be more difficult to eliminate or mitigate them.

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**Guidance Sheet SMP04/G/01 – Hazard Checklists**

This guidance contains information which can be used to generate Hazard Checklists for use in the conduct of PHI&A to identify possible Hazards and Accidents which might be associated with a system. Any Hazard checklist must be used in a “brainstorming”, imaginative way to stimulate discussions between stakeholders who have a good understanding of the system, its context and usage/maintenance environment. Checklists application in a narrow way or by those with a vague appreciation of the system will be very much less effective.

**General Hazard Checklist**

- B.1 The following headings provide a basis for the compilation of checklists to assist Preliminary Hazard Listing and Preliminary Hazard Analysis. The contents of the annex are not exhaustive. The objective is to identify hazards, their direct and indirect causes, and significant contributing factors.
- B.2 Hazardous components, eg
  - a. Flammable substances; eg solid, liquid or gaseous.
  - b. Lasers.
  - c. Explosives.
  - d. Asphyxiants, toxic or corrosive substances.
  - e. High temperature or cryogenic fluids.
  - f. Hazardous construction materials.
  - g. Pressure systems.
  - h. Electrical sources.
  - i. Ionising and non-ionising radiation sources.
  - j. Hydraulic arms or rotational machinery.
  - k. Other energy sources including those due to motion.
  - l. Exhaust gases.
  - m. Passive obstacles.
  - n. Hazardous surfaces.
  - o. Cut and puncture projections.
- B.3 Safety related interfaces between the various elements of the system, eg:
  - a. Material compatibilities.
  - b. Electromagnetic interference and compatibility.
  - c. Inadvertent activation.
  - d. Fire and explosion initiation and propagation.
  - e. Hardware and software controls.

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- B.4 Factors due to the operating domain, or that the system may add to the operating domain, eg:
- a. Drop.
  - b. Shock and vibration, including seismic.
  - c. Extreme temperatures, pressures and climatic conditions.
  - d. Noise.
  - e. Exposure to toxic or corrosive substances.
  - f. Fire or explosion.
  - g. Insect, rodent or mould damage.
  - h. Foreign bodies and dust.
  - i. Electrostatic discharge including lightning.
  - j. Electromagnetic interference.
  - k. Ionising and non-ionising radiation, including laser radiation.
  - l. Faults in supporting systems; eg power supplies, hydraulic systems.
  - m. Exhaust gases.
- B.5 Operating, test, maintenance and emergency procedures, eg:
- a. Operation under peace, exercise, war.
  - b. Human factors considerations.
  - c. Adequacy and effectiveness of instruction, training and rehearsal.
  - d. Health hazards.
  - e. User error, including failure to activate.
  - f. Effect of factors such as equipment layout, ergonomics and lighting.
  - g. Potential exposure to toxic materials, noise and radiation.
  - h. Life support systems.
  - i. Crash safety, egress, rescue and survival.
  - j. Repair and salvage.
- B.6 Enemy action, eg:
- a. Hostile acts.
  - b. Inaction of active protective systems.
  - c. Ineffectiveness of passive protective systems.
  - d. Damage containment.
- B.7 Damage control measures, eg:
- a. Damage containment.

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- b. Damage repair.
  - c. Hazard containment.
  - d. Egress, rescue and survival.
- B.8 Facilities, eg:
- a. Support equipment.
  - b. Training.
  - c. Provisions for storage of hazardous materiel.
  - d. Provisions for assembly of hazardous materiel.
  - e. Provisions for proof testing of hazardous materiel.
- B.9 The adequacy of safety related equipment, safeguards and failure containment measures, eg:
- a. Fire suppression systems.
  - b. Relief valves.
  - c. Energy containment vessels.
  - d. Electrical protection.
  - e. Toxic substance control.
  - f. Electrical, air and hydraulic supplies.
  - g. Personal protective equipment.
  - h. Ventilation.
  - i. Noise or radiation barriers.
  - j. Alarms and warnings.
- B.10 The defences against common mode failure, eg
- a. Systems redundancy and diversity.
  - b. Interlocks.
  - c. Fail safe design.
- B.11 Compliance with systems safety guidelines and standards, eg:
- a. Understanding of systems by personnel.
  - b. Incident recording and monitoring, including ``near misses``.
  - c. Operator deviation.
  - d. Design deviation.
  - e. Deviation in supervision and checking.
  - f. Component substitution.
- B.12 Threats to programmable electronic systems, eg:

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- a. Viruses.
- b. Security breaches.

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**Land Systems Hazard Checklist**

No domain-specific Hazard checklists – use generic checklists.

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<p><b>Sea Systems Hazard Checklist</b></p> <p>Naval Authority Key Hazards</p> <ul style="list-style-type: none"><li>a. • Structure</li><li>b. • Stability</li><li>c. • Escape and Evacuation</li><li>d. • Fire</li><li>e. • Propulsion and Machinery</li><li>f. • Explosives</li><li>g. • Submarine Hazards (Atmosphere Control, Watertight Integrity, Shielding)</li><li>h. • Ship/Air Interface (for embarked aviation)</li><li>i. • Navigational safety.</li></ul>
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Aviation Hazard Categories	
Hazard category	Key hazards assigned to hazard category
1. Fire	<ul style="list-style-type: none"> <li>• Fire</li> </ul>
2. Explosion	<ul style="list-style-type: none"> <li>• Explosion</li> </ul>
3. Disruption	<ul style="list-style-type: none"> <li>• Structural break up</li> <li>• EMC</li> <li>• Deliberate 3<sup>rd</sup> party</li> <li>• Incompatibilities (Procedures/Interoperability)</li> </ul>
4. Human performance	<ul style="list-style-type: none"> <li>• Design performance and handling characteristics of aircraft and systems in the air or on the ground.</li> <li>• Crew incapacitation</li> <li>• Congestion</li> <li>• Inappropriate competence</li> <li>• Inexperience</li> <li>• Inappropriate/Inadequate communication</li> <li>• Inadequate procedure</li> <li>• Unfit for duty</li> <li>• Lack of currency</li> <li>• In-discipline</li> <li>• Inadequate supervision</li> <li>• Human capacity Workload</li> </ul>
5. Operating hazard	<ul style="list-style-type: none"> <li>• Natural operating hazards</li> <li>• Man-made operating hazards</li> <li>• Inadvertent 3<sup>rd</sup> party</li> </ul>
6. Survival	<ul style="list-style-type: none"> <li>• Post accident survival</li> </ul>
7. Environment <sup>1</sup>	<ul style="list-style-type: none"> <li>• Noise</li> <li>• Vibration</li> <li>• Hazardous materials</li> <li>• Pollution</li> <li>• Emissions</li> </ul>

<sup>1</sup> Assessment of environmental hazards should take place through the application of POEMS.

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**OME Hazard Checklist**

See AOP-15 Ed2 (Stanag 4297 Ed2) "Guidance on the assessment of the safety and suitability for service of munitions for NATO Armed Forces"

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<b>0</b>	<b>SHOWING CONFORMANCE</b>
<b>0.1</b>	<b>Options</b>
0.1.1	<p>There are four options to demonstrate conformance when applying this system procedure:</p> <ol style="list-style-type: none"> <li>a. Follow the defined system procedure using the recommended guidance and tools, including allowed variations and options.</li> <li>b. Use an equivalent process and tool set generated elsewhere and document evidence of procedural equivalence.</li> <li>c. Use a bespoke process and tool set for the project and document how the bespoke procedure achieves the objectives defined for this system procedure.</li> <li>d. Where the procedure is considered to be not relevant, document the basis for this decision.</li> </ol>

<b>1</b>	<b>INTRODUCTION</b>
1.1.1	<p><b>Hazard Identification</b> is defined in Def Stan 00-56 Issue 4 as:</p> <p style="padding-left: 40px;"><i>“The process of identifying and listing the hazards and accidents associated with a system.”</i></p>
1.1.2	<p><b>Hazard Analysis</b> is defined in Def Stan 00-56 Issue 4 as:</p> <p style="padding-left: 40px;"><i>“The process of describing in detail the hazards and accidents associated with a system, and defining accident sequences.”</i></p>
1.1.3	<p><b>Hazard Identification and Analysis (HI&amp;A)</b> is the ongoing process of identifying credible hazards, accidents and accident sequences through the project life cycle. It confirms and extends the Preliminary Hazard Identification and Analysis (see Procedure SMP04 – Preliminary Hazard Identification and Analysis) by including consideration of system design aspects and by developing more details of hazards as the design develops. Hazard Identification and Hazard Analysis are parts of the Risk Management process and they are often conducted together or in direct sequence.</p>
1.1.4	<p>At successive stages of the project and in progressively greater detail, Hazard Identification and Analysis seeks to answer the question:</p> <p style="padding-left: 40px;"><i>“What Hazards and Accidents might affect this system and how could they happen?”</i></p>

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<b>2</b>	<b>PROCEDURE OBJECTIVES</b>	<p>2.1.1 The objective of HI&amp;A is to identify in detail all credible hazards and accidents that may arise during the life of the system so that the associated risks can be managed. It provides input to:</p> <ul style="list-style-type: none"> <li>a. Refining the safety requirements and criteria in the SRD;</li> <li>b. Identification of Regulatory requirements;</li> <li>c. Design decision making;</li> <li>d. Risk Evaluation;</li> <li>e. Option selection;</li> <li>f. Hazard Log;</li> <li>g. Safety Case Reports for Main Gate and subsequent System Acceptance and Introduction to Service;</li> <li>h. Identifying any critical areas of safety risk as input to Main Gate.</li> </ul>
<b>3</b>	<b>RESPONSIBILITIES</b>	
<b>3.1</b>	<b>Accountability</b>	
3.1.1		The IPTL is accountable for the completion of this procedure.
<b>3.2</b>	<b>Procedure Management</b>	
3.2.1		The IPTL may delegate the management of this procedure to a member (Safety Manager) or members of the IPT.
<b>3.3</b>	<b>Procedure Completion</b>	
3.3.1		The Project Safety Manager will be responsible for the completion of the procedure. However, in most cases a large part of the detailed work will be carried out by contractors. In all cases PSC members and other stakeholders should be involved in providing input and agreeing outputs.
3.3.2		Where different contractors are in competition with each other and have carried out separate Hazard Analyses, contractual and managerial arrangements should be made for the output from all to be made available to the successful contractor. This will reduce the likelihood of hazards being missed.
3.3.3		In large or complex projects, the Project Safety Manager must co-ordinate HI&A across the project to ensure that all relevant and credible hazards identified through

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HI&A by any party, including those outside the scope of a particular Contractor's control, are captured and managed through the Hazard Log.

- 4 WHEN**
- 4.1 Production**
- 4.1.1 HI&A is an iterative process, commencing in Assessment and continuing through Demonstration and Manufacture as the design is refined. At each phase the HI&A will be a major input to the Safety Case Report.
- 4.1.2 In addition, any significant changes in use or application identified during the In-service phase will require HI&A, and HI&A for the disposal phase should be updated with latest information in preparation and planning for disposal.
- 4.2 Review, Development and Acceptance**
- 4.2.1 Each major update to the HI&A shall be endorsed by the ISA (where the project requires ISA) and the Safety Panel, through endorsement of the Hazard Log and Safety Case Reports for Main Gate, System Acceptance and Introduction to Service.
- 4.2.2 If HI&A is updated, management measures should ensure that the Hazard Log, Safety Case Report, Safety Case and other dependent activities are also updated.

- 5 REQUIRED INPUTS**
- 5.1.1 This procedure for HI&A requires inputs from:
- a. Outputs from Procedure SMP03 – Safety Planning;
  - b. Outputs from Procedure SMP04 – Preliminary Hazard Identification and Analysis;
  - c. Outputs from Procedure SMP11 –Hazard Log;
  - d. Outputs from Procedure SMP12 –Safety Case and Safety Case Report.
- 5.1.2 The HI&A methods and timing will be defined in the Project Safety Plan, if appropriate by reference to the Contractor's Safety Plan.
- 5.1.3 The HI&A may use the following reference inputs, as available:
- a. Design Description;
  - b. Preliminary HI&A;
  - c. URD and Outline SRD;
  - d. Hazard Checklists (eg appended to Procedure SMP04 – Preliminary Hazard

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Identification and Analysis or from individual Safety Management Offices);

- e. Relevant Previous Hazard Logs/Analyses
- f. Accident and incident history from relevant existing systems in service.

**6 REQUIRED OUTPUTS**

6.1.1 The primary outputs of the HI&A are the initial Hazards, Accidents and Accident Sequences recorded in the Hazard Log for the project.

6.1.2 These results form part of the Safety Case body of evidence and may be recorded in a standalone report or as part of a wider report on Safety (eg Safety Assessment Report or Safety Case Report).

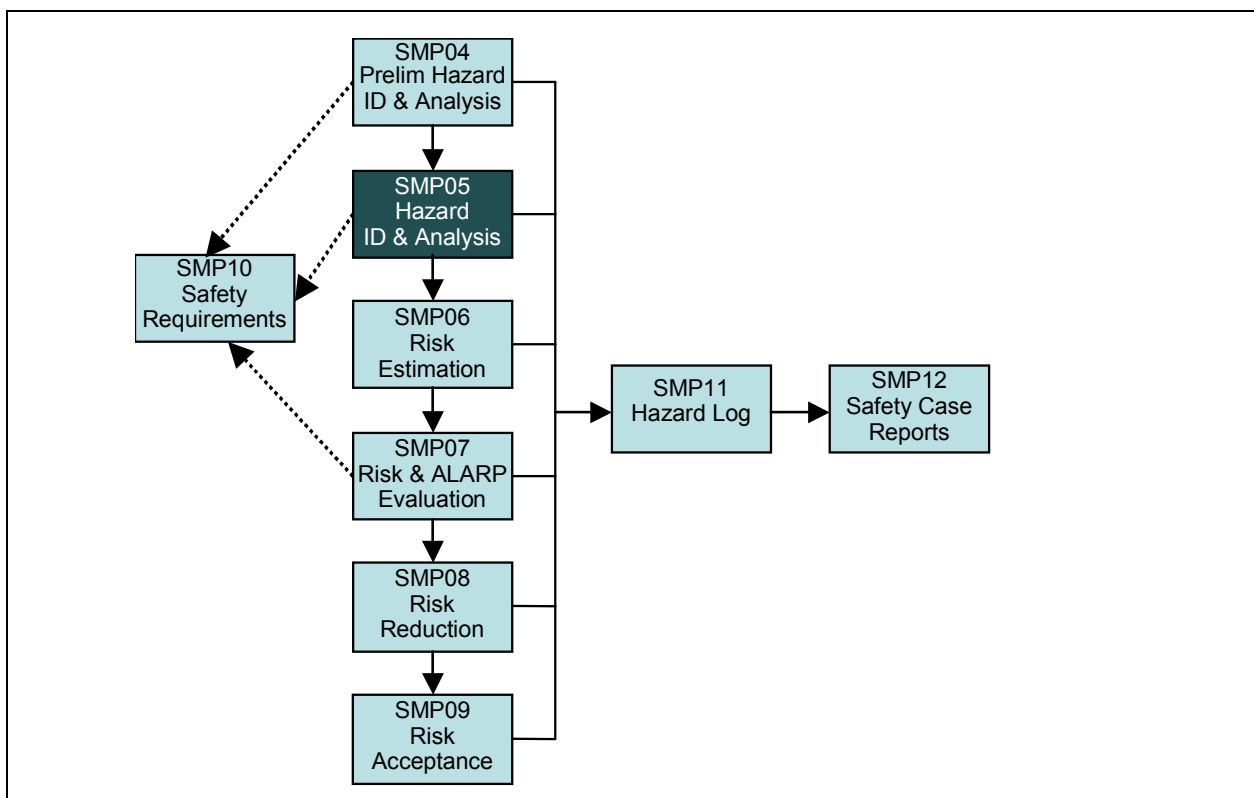
**7 DESCRIPTION**

7.1.1 HI&A provides the basis for all other safety activities on the project. It provides the detailed identification of hazards, the associated accidents and accident sequences. This information then provides the basis for assessing risks and ultimately the acceptability of the system.

7.1.2 The project shall carry out HI&A to identify credible hazards and accidents associated with the system and to determine the related accident sequences. The HI&A shall be reviewed and revised through the life of the project, as the design changes or as more information becomes available. The project shall demonstrate the adequacy of the HI&A process and the suitability of the techniques employed.

7.1.3 The relationship of this activity with other Risk Management activities is illustrated below:

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## 7.2 Method

7.2.1 The form, nature and depth of the HI&A should be proportionate to the complexity and significance of the project, considering any safety-related functionality. There are a number of techniques that may be used to assist in the identification of Hazards and Accidents and in understanding Accident sequences:

- a. Hazard Checklist;
- b. Accident and History Review;
- c. Functional Failure mode and Effects Analysis (FMEA);
- d. Structured What If Technique (SWIFT);
- e. Hazard and Operability Study (HAZOP).

7.2.2 Different approaches and techniques are best suited to different systems or technologies and no single approach is likely to be sufficient on its own. Usually a combination of complementary techniques should be used in order to maximise the proportion of hazards identified. The adequacy of the technique/s adopted should be justified in the Safety Case. The project should ensure that any Hazard Analyses carried out by contractors use appropriate techniques and are consistent across the project.

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- 7.2.3 The project should ensure that the techniques selected are suitable for identifying hazards and accidents arising from:
- a. Systematic and random failures.
  - b. Credible failures arising from normal and abnormal use in all operational scenarios.
  - c. Predictable misuse and erroneous operation.
  - d. Common cause and common mode failures.
  - e. Interactions between systems, sub-systems or components.
  - f. The defined operating environment.
  - g. Procedural, managerial and cultural activities.
  - h. Storage, transportation, disposal and other such activities.

**8 RECORDS AND PROJECT DOCUMENTATION**

- 8.1.1 Where relevant, the outputs from this procedure should feed into the following:
- a. SRD (System Requirements Document) – for any specific Safety requirements;
  - b. CSA (Customer Supplier Agreement) – to document agreements on Safety information to be delivered by the IPT;
  - c. TLMP (Through Life Management Plan);
  - d. Safety elements of Initial Gate and Main Gate submissions.
- 8.1.2 The Hazard Log is the primary mechanism for recording all Hazards, Accidents and Accident Sequences identified through HI&A. It is a live document, updated with the results of each HI&A as they become available. See Procedure SMP11 – Hazard Log, for more details.
- 8.1.3 The results of the HI&A should be reported in a form which records the following:
- a. The input information used (eg URD version, Concept of Use document, design standard);
  - b. The approach adopted (eg: tools and techniques used);
  - c. The people consulted;
  - d. The Hazards, Accidents and Accident Sequences identified.

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- 8.1.4 These results form part of the Safety Case body of evidence and may be recorded in a standalone report or as part of a wider report on Safety (eg Safety Assessment Report or Safety Case Report).
- 8.1.5 The Safety Case Report (Procedure SMP12 – Safety Case and Case Report) is where the project should demonstrate the adequacy of the HI&A process and the suitability of the techniques employed.

**9 RECOMMENDED TOOLS AND FORMS**

9.1.1 Detailed information on tools and techniques is provided in the Safety Manager’s Toolkit.

**10 GUIDANCE**

10.1.1 The project should ensure that Hazard Analyses are carried out in a planned and structured manner throughout the project. In a major project this will involve multiple Analyses for different sub-systems as well as the complete system, and at different stages of design or demonstration. The planning of this must ensure that:

- a. Hazards and accidents are identified at times where action can be taken to mitigate or eliminate them most efficiently (ie. at an appropriate point in the design cycle).
- b. Comprehensive, up to date hazard analysis is available to support development of the Safety Case Reports.
- c. Adequate operational experience (see below) and historical data is available to support HI&A sessions.

10.1.2 HI&A should be undertaken using a combination of techniques with the aim of providing confidence that the greatest number of credible hazards and accidents have been identified taking into account the nature and complexity of the system. This should include the anticipated use in wartime or other operational scenarios. However, an appropriate and proportionate approach should be adopted and the operational scenarios agreed with the Customer.

10.1.3 All available, relevant data should be considered, including accident and incident data from similar systems. Reasonable effort should be made to ensure that all possible Hazards are examined. It is essential that the appropriate team of experts is used in the HI&A process, providing a sound understanding of:

- a. The system description;
- b. Operational profiles, maintenance, operator and maintainer competencies;
- c. The application and limitations of selected HAZID techniques;

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- d. The existing and/or commonly known Hazards of this or similar types of system;
  - e. Validity of historical data adjusted to account for its context.
- 10.1.4 Justification that the selected techniques are sufficient to identify the full range of credible hazards and accidents should be provided in the Safety Case and summarised in the Safety Case Report. The project should ensure that there is sufficient communication of design, technical and operational information to allow HI&A to be carried out effectively. In addition, the credibility of hazards identified should be discussed, together with the possibility of resultant accidents and the consequences of such accidents; it is important that realism is taken into account whilst still ensuring the widest coverage of potential accident sequences. This should include identifying and involving individuals with expertise in specialist areas, where necessary.
- 10.1.5 The identification of hazards and their associated accident sequences should be a continual, iterative process. Inevitably, new safety requirements will be derived as the system evolves. This highlights the importance of the Hazard Log in tracking the management of hazard-related activities and why the Hazard Log should be created at project inception. [Based on Def Stan 00-56 Issue 4 Part 2].
- 10.2 Alignment with Environment**
- 10.2.1 The key alignment opportunity in SMP05 is to cross reference Environmental Features against Safety Hazards, so that common issues are identified and where possible assessed together, and to also to ensure that the potential environmental impact of a safety hazard, or a safety impact of an environmental hazard are not overlooked.
- 10.2.2 It is also important to plan and conduct assessment studies which can meet both safety and environmental evaluation requirements. Where this is not possible, alignment should help ensure that results of safety assessments are reviewed for environmental implications and vice versa.
- 10.3 Domain-Specific Guidance and References**
- 10.3.1 Additional guidance on HI&A is contained in the following references:
- a. Land Systems: JSP 454 Issue 4:
    - i. Part 2 Section 6.3.4
  - b. Ship Safety Management: JSP 430 Issue 3:
    - i. Part 1 Section 11 Safety Cases (11.6)
  - c. Airworthiness: JSP 553 1<sup>st</sup> Edition:
    - i. Chapter 4 (4.3)

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- d. Ordnance, Munitions & Explosives (OME): JSP 520 Issue 2.0:
  - i. Chapter 3 Section I
  - ii. Chapter 4 (0413, 0416 and 0429)
- e. Nuclear Propulsion: JSP 518 Issue 1.2
  - i. Appendix F to Annex A (AF12, AF20)
  - ii. Appendix H to Annex A (AH08)
  - iii. Annex G (G08)

**10.4 Guidance for Different Acquisition Strategies**

- 10.4.1 The requirements for HI&A do not change for Acquisition conducted through intergovernmental agreements, OCCAR, multilateral or collaborative programmes. It is MOD policy that the same standards are met, and that assurance that these standards have been met can be demonstrated.
- 10.4.2 Where the project involves a mid-life update, existing history will obviously provide a major input to HI&A. Similarly, where the project is likely to involve COTS or MOTS solutions (including non-UK solutions) the existing history of these solutions provides a starting point. However, in all these cases there is still a need to carry out HI&A to determine whether any new Hazards are introduced by the proposed use in a UK context, through particular safety-related functionality, new interfaces, different support and usage environments, different operational employments, etc.

**10.5 Warnings and Potential Project Risks**

- 10.5.1 If inadequate operational and domain knowledge is available for HI&A, it is likely that important hazards will be missed or that unrealistic hazards will be included in the Hazard Log. It can be difficult to correct these errors later in the programme, when important requirements and design decisions have been implemented.
- 10.5.2 If IPTs do not ensure a controlled and effective exchange of information on Hazards throughout the project, it is likely that there will be areas of design and implementation where lack of awareness will result in higher risk solutions.
- 10.5.3 A Hazard checklist is useful for most Hazard Analyses, but should not be the only method, of HI&A (except for standard installations whose hazards have been studied in more detail elsewhere). In all other cases some form of structured brainstorming (eg SWIFT or HAZOP) is highly desirable.
- 10.5.4 When identifying Hazards, the scope should not be restricted to the steady-state operational scenario, but must consider all aspects of the system's life cycle, from installation to final decommissioning and disposal, including Maintenance and Upgrades (ie CADMID). Emergency scenarios and associated Contingency modes of Operation should also be considered.

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10.5.5 Absence of a systematic and comprehensive HI&A activity can severely undermine the Risk Management process. In the worst case, this can create an illusion of Safety and a false sense of confidence, and can miss opportunities to eliminate a hazard in the earliest stages of a project when the greatest range of options still exist.

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<b>0</b>	<b>SHOWING CONFORMANCE</b>
<b>0.1</b>	<b>Options</b>
0.1.1	There are four options to demonstrate conformance when applying this system procedure: <ul style="list-style-type: none"> <li>a. Follow the defined system procedure using the recommended guidance and tools, including allowed variations and options.</li> <li>b. Use an equivalent process and tool set generated elsewhere and document evidence of procedural equivalence.</li> <li>c. Use a bespoke process and tool set for the project and document how the bespoke procedure achieves the objectives defined for this system procedure.</li> <li>d. Where the procedure is considered to be not relevant, document the basis for this decision.</li> </ul>
<b>1</b>	<b>INTRODUCTION</b>
1.1.1	<b>Risk Estimation</b> is defined in Def Stan 00-56 Issue 4 as: <i>“The systematic use of available information to estimate risk.”</i>
1.1.2	Risk Estimation estimates the level of risk posed by each Accident (and through the Accident Sequences, the associated Hazards) identified in the Hazard Identification and Analysis (see SMP05 – Hazard Identification and Analysis). This provides a basis for assessing whether the risk is acceptable.
1.1.3	Like Hazard Identification and Analysis, this is usually an iterative process, becoming more detailed as the design develops, and often involves considerable detailed work by the contractor to provide the evidence necessary to support the Risk and ALARP Evaluation and the Safety Case.
1.1.4	At successive stages of the project and in progressively greater detail, Risk Estimation seeks to answer the question:  <i>“What level of Safety Risk is posed by the identified Accidents, individually and in total?”</i>
<b>2</b>	<b>PROCEDURE OBJECTIVES</b>
2.1.1	The objective of Risk Estimation is to determine the likelihood and consequences of individual hazards and accidents, and the overall aggregation of Safety risk for the project. It provides input to: <ul style="list-style-type: none"> <li>a. Refining the safety requirements and criteria in the SRD;</li> </ul>

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- b. Design decision making;
- c. Risk Evaluation;
- d. Option selection;
- e. Hazard Log;
- f. Safety Case Reports;
- g. Identifying any critical areas of safety risk as input to Main Gate.

**3 RESPONSIBILITIES**

**3.1 Accountability**

3.1.1 The IPTL is accountable for the completion of this procedure.

**3.2 Procedure Management**

3.2.1 The IPTL may delegate the management of this procedure to a member (Safety Manager) or members of the IPT.

**3.3 Procedure Completion**

3.3.1 The Project Safety Manager will be responsible for the completion of the procedure. However, in most cases a large part of the detailed work will be carried out by contractors. In all cases PSC members and other stakeholders should be involved in providing input and agreeing outputs.

3.3.2 In large or complex projects, the Project Safety Manager must co-ordinate Risk Estimation across the project to ensure that all a consistent and coherent approach to Risk Estimation is adopted by all parties.

**4 WHEN**

**4.1 Production**

4.1.1 Risk Estimation is an iterative process, commencing in Assessment and continuing through Demonstration and Manufacture as the design is refined. At each phase the Risk Estimation will be a major input to the Safety Case Report.

4.1.2 In addition, any significant new hazards identified during the remaining phases of the project lifecycle will require Risk Estimation based on the latest information.

**4.2 Review, Development and Acceptance**

4.2.1 Each major update to the Risk Estimation shall be endorsed by the ISA (where the project requires ISA) and the Safety Panel, through endorsement of the Hazard Log and Safety Case Reports for Main Gate, System Acceptance and Introduction to Service.

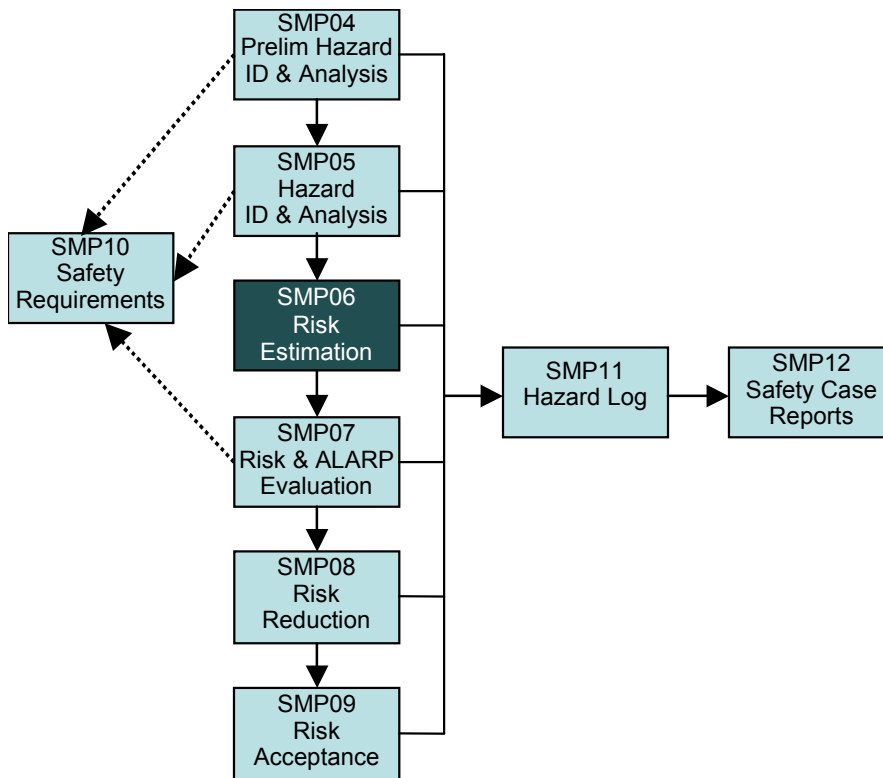
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4.2.2	If Risk Estimation is updated, management measures should ensure that the Hazard Log, Safety Case Report, Safety Case and other dependent activities are also updated.
<b>5</b>	<b>REQUIRED INPUTS</b>
5.1.1	This procedure for Risk Estimation requires inputs from: <ul style="list-style-type: none"> <li>a. Outputs from Procedure SMP03 – Safety Planning;</li> <li>b. Outputs from Procedure SMP04 – Preliminary Hazard Identification and Analysis;</li> <li>c. Outputs from Procedure SMP11 –Hazard Log;</li> <li>d. Outputs from Procedure SMP12 –Safety Case and Safety Case Report;</li> <li>e. Outputs from Procedure SMP05 –Hazard Identification and Analysis.</li> </ul>
5.1.2	The Hazard Analysis methods and timing will be defined in the Project Safety Plan, if appropriate by reference to the Contractor’s Safety Plan.
5.1.3	The Risk Estimation may use the following reference inputs, as available: <ul style="list-style-type: none"> <li>a. Design Description;</li> <li>b. Hazard Analysis;</li> <li>c. URD and Outline SRD;</li> <li>d. Relevant Previous Hazard Logs/Analyses;</li> <li>e. Accident and incident history from relevant existing systems in service.</li> </ul>
<b>6</b>	<b>REQUIRED OUTPUTS</b>
6.1.1	The primary outputs of the Risk Estimation are the estimates of risk level associated with Hazards, Accidents and Accident Sequences recorded in the Hazard Log for the project.
<b>7</b>	<b>DESCRIPTION</b>
7.1.1	Risk Estimation determines (quantitatively or qualitatively) the risk consequences of individual Hazards, Accidents and Accident Sequences. It provides the basis for assessing risks against requirements, the needs for risk reduction, the selection between alternative options on safety grounds and ultimately the acceptability of the system.
7.1.2	The Project shall carry out Risk Estimation to systematically determine the severity of the Consequence and the likelihood of occurrence for the hazards and accidents, within each accident sequence. The Project shall determine systematically the overall risk posed by the system.

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- 7.1.3 The Project shall demonstrate the effectiveness of the Risk Estimation process and the suitability of the techniques employed. All assumptions, data, judgements and calculations underpinning the analysis shall be recorded in the Safety Case, such that the analysis can be reviewed in detail.
- 7.1.4 The Risk Estimation shall be reviewed and revised through the life of the contract, as the design changes or as information becomes available.
- 7.1.5 The diagram below shows how Risk Estimation relates to other elements of Risk Management in the Safety Management System.



**7.2 Method**

- 7.2.1 Once the process of identifying the hazards and accidents, and defining the associated accident sequences, is complete, the next step is to determine the likelihood and consequences of each scenario. This will enable the risk of each identified situation to be assessed.
- 7.2.2 Where contractors are carrying out all or part of the Risk Estimation, the Project Safety Manager will need to ensure that a consistent and coherent approach is adopted by all parties, and that contractors have access to MOD sources of in-service data and experience to underpin probability and consequence estimates
- 7.2.3 In addition to addressing individual risks, it is important that the aggregation of risk is considered, so that the total risk due to all causes is determined.

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- 7.2.4 The project should demonstrate the effectiveness of the Risk Estimation methodology within the Safety Case. If sufficiently accurate, suitable and complete data is available and the risks posed by the system are high or uncertain (eg novel technology), a quantitative methodology may be adopted either for the entire system or for specific areas. Otherwise a qualitative methodology should be used.
- 7.2.5 Where Cost-Benefit Analysis will be used as part of the Risk Evaluation, the project should adopt a quantitative methodology for Risk Estimation.
- 7.2.6 For each hazard, the Risk Estimation should be sufficiently detailed and robust to demonstrate that the risk has not been underestimated or insufficiently understood. The Risk Estimation should be based on objective data where possible. Where data is used, sensitivity analysis should be applied. Where data cannot be obtained, or is of limited applicability, subjective judgement may be used, but should be used cautiously and subject to expert scrutiny. Any such judgements or any assumptions made during the analysis should be documented in the Safety Case.
- 7.2.7 Risk Estimation is an iterative process. As the development of the system progresses through its life, hazards should be re-examined to ensure that the Risk Estimation remains valid. Furthermore, additional hazards will undoubtedly be identified that need to be addressed.

**8 RECORDS AND PROJECT DOCUMENTATIONS**

- 8.1.1 Where relevant, the outputs from this procedure should feed into the following:
  - a. SRD (System Requirements Document) – for any specific Safety requirements;
  - b. CSA (Customer Supplier Agreement) – to document agreements on Safety information to be delivered by the IPT;
  - c. TLMP (Through Life Management Plan);
  - d. Safety elements of Initial Gate and Main Gate submissions.
- 8.1.2 The Hazard Log is the primary mechanism for recording the Risk Level estimates identified through Risk Estimation. It is a live document, updated with the results of each Hazard Analysis as they become available. See Procedure SMP11 – Hazard Log for more details.
- 8.1.3 The results of the Risk Estimation should be reported in a form which records the following:
  - a. The input information used (eg. URD version, Concept of Use document, design standard);
  - b. The approach adopted (eg. tools and techniques used);
  - c. The people consulted;
  - d. The Hazards, Accidents and Accident Sequences identified.

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- 8.1.4 These results form part of the Safety Case body of evidence and may be recorded in a standalone report or as part of a wider report on Safety (eg Safety Assessment Report or Safety Case Report).
- 8.1.5 The Safety Case Report (Procedure SMP12 – Safety Case and Case Report) is where the project should demonstrate the adequacy of the Risk Estimation process and the suitability of the techniques employed.

**9 RECOMMENDED TOOLS AND FORMS**

- 9.1.1 Detailed information on tools and techniques for Risk Estimation is provided in the Safety Manager’s Toolkit.

**10 GUIDANCE**

- 10.1.1 Identified Accidents should be systematically evaluated to estimate their severity and likelihood of occurrence for all possible events, as far as is reasonably practicable. This severity of a Hazard’s consequence should be predicted in terms of harm to personnel, the platform, its equipment and the effect on others who may be affected. The likelihood of occurrence should be calculated using engineering judgement or on the basis of past experience and precedent.
- 10.1.2 The risk can then be estimated either quantitatively or a qualitatively (see 7.2.4) from the product of consequence and its likelihood. The factors of past experience and precedent should be used to influence how the individual risks are ranked and can be used to benchmark or “reality check” the risk levels estimated. This approach is of particular importance when considering societal perceptions, for hazards that might have otherwise received a lower risk ranking.
- 10.1.3 The risk estimates are based upon calculations which have used a number of approximations or assumptions for usage, etc. but also an assessment of how often an event will occur, which may never have actually happened but can be foreseen. In these circumstances there will be no mathematical certainty in the results and consequently these results must be treated with caution. However, the band widths for frequency and tolerability are wide and generally the accuracy should be sufficient to put risks in an appropriate category. Sensitivity analysis should be performed to show whether small variations in the inputs to risk calculations would have an effect on the outcome. When the accuracy of the input data is questionable, this can help give assurance that the right classification has been made. In the final analysis, what is important is that possible accidents are identified and that appropriate and proportional mitigation measures are taken which will reduce the possibility of those accidents occurring.

10.1.4 Many techniques for identifying the consequences of individual component/subsystem failures are often used within other Systems Engineering communities (logistics, human factors, reliability etc.). Therefore the results of such

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assessment studies may be readily available, albeit for a slightly different context or focus. The main techniques are discussed below:

- a. Graphical techniques such as Event Tree Analysis (ETA) or Fault Tree Analysis (FTA) can prove very powerful when used on their own or in conjunction with bottom-up techniques such as Failure Modes and Effects and Criticality Analysis (FMECA), Consequence Modelling Analysis and other detailed Risk Evaluation techniques. However, these traditional techniques are poor at studying systems interactions and capturing human error. Techniques such as Environmental Impact Assessment (EIA) or those from Human Factors Integration (HFI) including performance studies using Human Reliability Analysis (HRA) can prove useful supplements for the quantification of risks;
- b. Other useful data may come from other disciplines including quality assurance, Occupational Health & Safety (OH&S) workplace Risk Evaluations, Availability, Reliability and Maintainability Studies (AR&M). AR&M, HFI or project Risk Analyses can contribute to Safety Assessment. Sharing information between different systems engineering domains is encouraged, as it ensures that there is a common understanding of the system and makes best use of available resources as part of life-cycle costing.
- c. See also the Safety Manager's Toolkit for further guidance on techniques available for Risk Estimation, together with information on their strengths and weaknesses.

## **10.2 Domain-Specific Guidance and References**

10.2.1 Additional guidance on Risk Estimation is contained in the following references:

- a. Land Systems: JSP 454 Issue 4:
  - i. Part 2 Section 6.4.3
- b. Ship Safety Management: JSP 430 Issue 3: (10.5)
- c. Airworthiness: JSP 553 1<sup>st</sup> Edition:
  - i. Chapter 4 (4.33)
- d. Ordnance, Munitions & Explosives (OME): JSP 520 Issue 2.0:
  - i. Chapter 3 (0303)
- e. Nuclear Propulsion: JSP 518 Issue 1.2
  - i. Chapter 4 (0431)
  - ii. Chapter 6 (0605)
  - iii. Annex G (G08)

## **10.3 Guidance for Different Acquisition Strategies**

10.3.1 The requirements for Risk Estimation do not change for Acquisition conducted

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through intergovernmental agreements, OCCAR, multilateral or collaborative programmes. It is MOD policy that the same standards are met, and that assurance that these standards have been met can be demonstrated.

10.3.2 Where the project involves a mid-life update, existing history will obviously provide a major input to Risk Estimation. Similarly, where the project is likely to involve COTS or MOTS solutions (including non-UK solutions) the existing history of these solutions provides a starting point. However, in all these cases there is still a need to determine whether likelihoods or consequences are affected by the proposed use in a UK context, through new interfaces, different support and usage environments, different operational employments, etc.

**10.4 Warnings and Potential Project Risks**

10.4.1 The greatest challenge in Risk Estimation is deriving realistic and relevant probabilities of occurrence. Where data is used, it is vital that the data is relevant, accurate and not misinterpreted. Where data does not exist, it is vital that any qualitative assessments are based on adequate operational and domain knowledge. The consequences could be significant errors in the assessment and acceptance of risks, potentially leading to unexpected accidents in service. At the very least, late identification of errors in Risk Estimation (eg by ISA) could result in delays in acceptance and rework.

10.4.2 Failure to provide adequate quality control and traceability of the basis for Risk Evaluation can undermine the Safety Case and seriously delay acceptance.

10.4.3 Although Event Trees and Fault Trees are commonly used in assessing overall risks, these are often incorrectly used by inexperienced/non-specialist staff (MOD and contractor) resulting in difficulties at acceptance. Projects are advised to seek adequate assurance of competence of Risk Estimation staff.

10.4.4 All analyses must be for the current design standard. If analyses are not kept up to date with design configuration changes, there is a risk that decisions may be based on incorrect information.

10.4.5 Risk Estimation must be as realistic as possible because unduly optimistic or pessimistic assessments will lead to incorrect prioritisation and incorrect targeting of resources. For this reason, unrealistic “worst case” assumptions should not be used. However, sensitivity analysis and adoption of the precautionary principle are necessary when dealing with significant areas of uncertainty.

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**0 SHOWING CONFORMANCE**

**0.1 Options**

0.1.1 There are four options to demonstrate conformance when applying this system procedure:

- a. Follow the defined system procedure using the recommended guidance and tools, including allowed variations and options.
- b. Use an equivalent process and tool set generated elsewhere and document evidence of procedural equivalence.
- c. Use a bespoke process and tool set for the project and document how the bespoke procedure achieves the objectives defined for this system procedure.
- d. Where the procedure is considered to be not relevant, document the basis for this decision.

**1 INTRODUCTION**

1.1.1 **ALARP** stands for “As Low As Reasonably Practicable” and is defined in Def Stan 00-56 Issue 4 as:

*“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.”*

1.1.2 **Risk and ALARP Evaluation** is defined in Def Stan 00-56 Issue 4 as:

*“The systematic determination, on the basis of tolerability criteria, of whether a risk is broadly acceptable, or tolerable and ALARP, and whether any further Risk Reduction is necessary.”*

1.1.3 Risk and ALARP Evaluation identifies where the project currently meets tolerability criteria, and where further action is needed to achieve this. It thus provides one of the main inputs to the Safety Case and, ultimately, to the acceptance of the system.

1.1.4 At successive stages of the project and in progressively greater detail, Risk and ALARP Evaluation seeks to answer the question:

*“How significant are the Safety Risks posed by the identified Accidents, individually and in total and could we reasonably be expected to reduce them further ?”*

**2 PROCEDURE OBJECTIVES**

2.1.1 The objective of Risk and ALARP Evaluation is to compare the risks identified in Risk Estimation to tolerability criteria and to judge whether they are currently acceptable or must be subject to risk reduction.

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- 2.1.2 Risk and ALARP Evaluation provides input to:
- a. Risk Reduction
  - b. Risk Acceptance, and determining the management level for Risk Acceptance
  - c. Option selection
  - d. Hazard Log
  - e. Safety Case Reports
  - f. Identifying areas of higher risk for focussing safety effort

**3 RESPONSIBILITIES**

**3.1 Accountability**

3.1.1 The IPTL is accountable for the completion of this procedure.

**3.2 Procedure Management**

3.2.1 The IPTL may delegate the management of this procedure to a member (Safety Manager) or members of the IPT.

**3.3 Procedure Completion**

3.3.1 The Project Safety Manager will be responsible for the completion of the procedure. However, in most cases a large part of the detailed work will be carried out by contractors. In all cases PSC members and other stakeholders should be involved in providing input and agreeing outputs.

3.3.2 In large or complex projects, the project must co-ordinate Risk Estimation across the project to ensure that a consistent and coherent approach to Risk Estimation is adopted by all parties.

**4 WHEN**

**4.1 Production**

4.1.1 Risk and ALARP Evaluation follows Risk Estimation, and hence is an iterative process, commencing in Assessment and continuing through Demonstration and Manufacture as the design is refined. At each phase, the Risk and ALARP Evaluation will be a major input to the Safety Case Report.

4.1.2 In addition, any significant new hazards identified In-service will require Risk and ALARP Evaluation, and Risk and ALARP Evaluation for the disposal phase should be updated with latest information in preparation and planning for disposal.

**4.2 Review, Development and Acceptance**

4.2.1 Each major update to the Risk and ALARP Evaluation shall be endorsed by the ISA (where the project requires ISA) and the Safety Panel, through endorsement of the

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Hazard Log and Safety Case Reports for Main Gate, System Acceptance and Introduction to Service.

4.2.2 If Risk and ALARP Evaluation is updated, management measures should ensure that the Hazard Log, Safety Case Report, Safety Case and other dependent activities are also updated. In particular any new requirements for Risk Reduction must be highlighted.

**5 REQUIRED INPUTS**

- 5.1.1 This procedure for Risk and ALARP Evaluation requires inputs from:
- a. Outputs from Procedure SMP03 – Safety Planning;
  - b. Outputs from Procedure SMP04 – Preliminary Hazard Identification and Analysis;
  - c. Outputs from Procedure SMP11 –Hazard Log;
  - d. Outputs from Procedure SMP12 –Safety Case and Safety Case Report;
  - e. Outputs from Procedure SMP05 –Hazard Identification and Analysis;
  - f. Outputs from Procedure SMP06 –Risk Estimation.
- 5.1.2 The Risk and ALARP Evaluation methods and timing will be defined in the Project Safety Management Plan, if necessary with reference to the Contractor’s Safety Management Plan.
- 5.1.3 The Risk and ALARP Evaluation may use the following reference inputs, as available:
- a. Risk Estimation;
  - b. Tolerability Criteria;
  - c. SRD;
  - d. Accident and incident history from relevant existing systems in service.

**6 REQUIRED OUTPUTS**

6.1.1 The primary outputs of the Risk and ALARP Evaluation are the Safety Case statements/evidence of tolerability of risks and documented ALARP justifications, plus identified needs for Risk Reduction.

**7 DESCRIPTION**

**7.1 General**

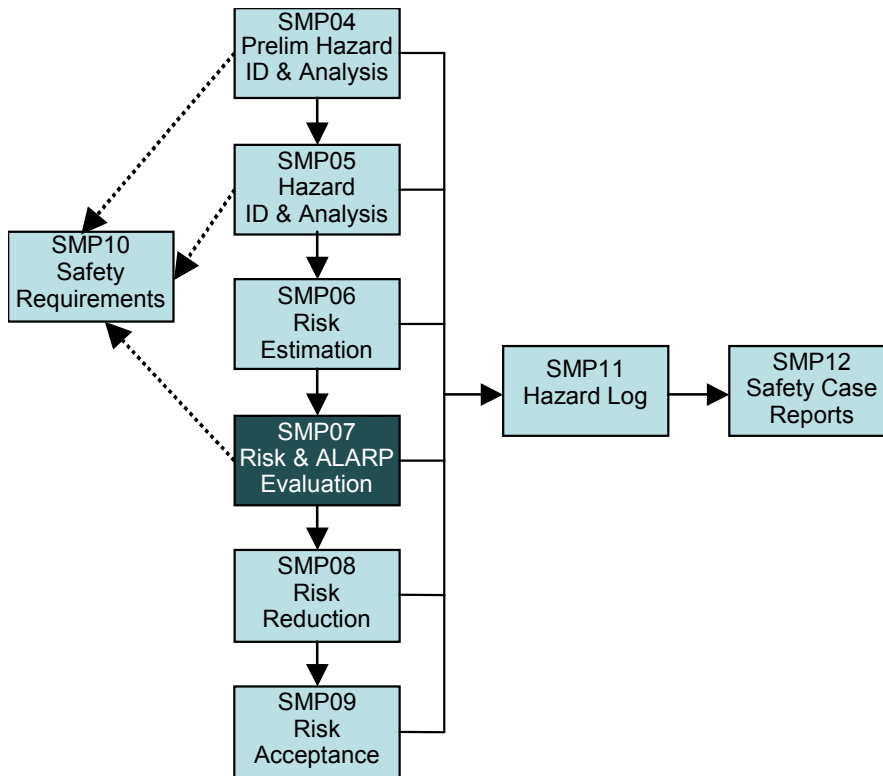
7.1.1 The Project shall ensure that Risk and ALARP Evaluation is undertaken, to determine whether the achieved risk level is tolerable, or broadly acceptable, for the identified accidents associated with the system, and for the overall risk posed by the system. For

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any risk that is not broadly acceptable, the Risk and ALARP Evaluation shall also determine whether or not the achieved risk level is As Low As Reasonably Practicable (ALARP).

7.1.2 The diagram below shows how Risk and ALARP Evaluation relates to other elements of Risk Management in the Safety Management System.



## 7.2 Risk Evaluation

7.2.1 The Project, in agreement with all relevant stakeholders and authorities, shall establish Tolerability criteria based on relevant legislation, Standards and MOD policy. These shall form the basis for making a judgement as to whether a risk is broadly acceptable, or tolerable and ALARP.

7.2.2 The tolerability criteria shall be considered to have been met when individual risks and the overall risk posed by the system have been demonstrated to be broadly acceptable, or tolerable and ALARP.

7.2.3 The Risk and ALARP Evaluation shall be reviewed and revised through the life of the contract, as the design changes or as information becomes available. The Project shall demonstrate the effectiveness of the Risk and ALARP Evaluation process and the suitability of the techniques employed.

## 8 RECORDS AND PROJECT DOCUMENTATION

8.1.1 Where relevant, the outputs from this procedure should feed into the following:

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- a. SRD (System Requirements Document) – for any specific Safety requirements;
  - b. CSA (Customer Supplier Agreement) – to document agreements on Safety information to be delivered by the IPT;
  - c. TLMP (Through Life Management Plan);
  - d. Safety elements of Initial Gate and Main Gate submissions.
- 8.1.2 The Hazard Log is the primary mechanism for recording the results of the Risk and ALARP Evaluation. See Procedure SMP11 – Hazard Log, for more details.
- 8.1.3 The results of the Risk and ALARP Evaluation should be reported in a form which records the following:
- a. The input information used (eg URD version, Concept of Use document, design standard, Criteria applied);
  - b. The approach adopted;
  - c. The people consulted;
  - d. The Hazards, Accidents and Accident Sequences identified, together with their Risk level estimates;
  - e. Conclusions reached on the acceptability of each identified risk, together with the justification;
  - f. Identification of areas where further Risk Reduction is considered to be necessary.
- 8.1.4 These results form part of the Safety Case body of evidence and may be recorded in a standalone report or as part of a wider report on Safety (eg Safety Assessment Report or Safety Case Report).
- 8.1.5 The Safety Case Report (Procedure SMP12 – Safety Case and Case Report) is where the project should demonstrate the adequacy of the Risk and ALARP Evaluation process and the suitability of the approach adopted.
- 
- 9 RECOMMENDED TOOLS AND FORMS**
- 9.1.1 Detailed information on tools and techniques for Risk and ALARP evaluation is provided in the Safety Manager’s Toolkit.

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## 10 GUIDANCE

### 10.1 ALARP Evaluation

- 10.1.1 The aim is for all identified risks and the overall risk posed by the system to be assessed as being Broadly Acceptable. Should this not be the case, the risk should be reduced to a level that is Tolerable and ALARP.
- 10.1.2 The ALARP principle accepts that risk reduction may cease when the cost of any further work becomes grossly disproportionate to the benefits gained. In this context, the term ‘cost’ includes factors additional to finance including penalties to military capability. However ALARP does not mean that no further improvement is possible within the original project budget – this is not a sufficient justification of ALARP.
- 10.1.3 As for all risk management activities, ALARP Evaluation is an iterative process. Whenever there are changes to the system (whether by design or by evolution), changes to assumptions, changes in the operating environment or changes through age, there should be a re-assessment of all risks falling within the scope of the change.
- 10.1.4 Decisions on whether risks are ALARP can also change over time as new risk reduction technologies become available, the concept of “best practice” changes or the perceived value of risk reduction alters. Whether a potential measure to reduce risk is reasonably practicable may also be affected by decisions to extend the life.
- 10.1.5 Table 7.1 shows how both the level of risk and whether a risk is ALARP need to be considered when determining whether the risk is acceptable.

**Table 7.1: Judging the Acceptability of Risk**

Level of Risk	Have the risks been shown to be ALARP ?	
	Yes	No
<b>Unacceptable</b>	Unacceptable – unless there are exceptional reasons for the activity to take place	Unacceptable
<b>Tolerable</b>	Acceptable	Unacceptable
<b>Broadly Acceptable</b>	Acceptable	Acceptable – but risk should be reduced wherever reasonably practicable

- 10.1.6 The Project should demonstrate any claims that all reasonable steps have been taken to ensure that risk is tolerable and ALARP and demonstrate that they have exercised their common law “duty of care”. The level of evidence required is a function of the level of risk and the domain. This will also involve demonstrating that further risk reduction methods have been actively sought and considered in a systematic way.
- 10.1.7 Project Safety Managers should continuously monitor risk levels and consider updating their target Requirements as circumstances change through:

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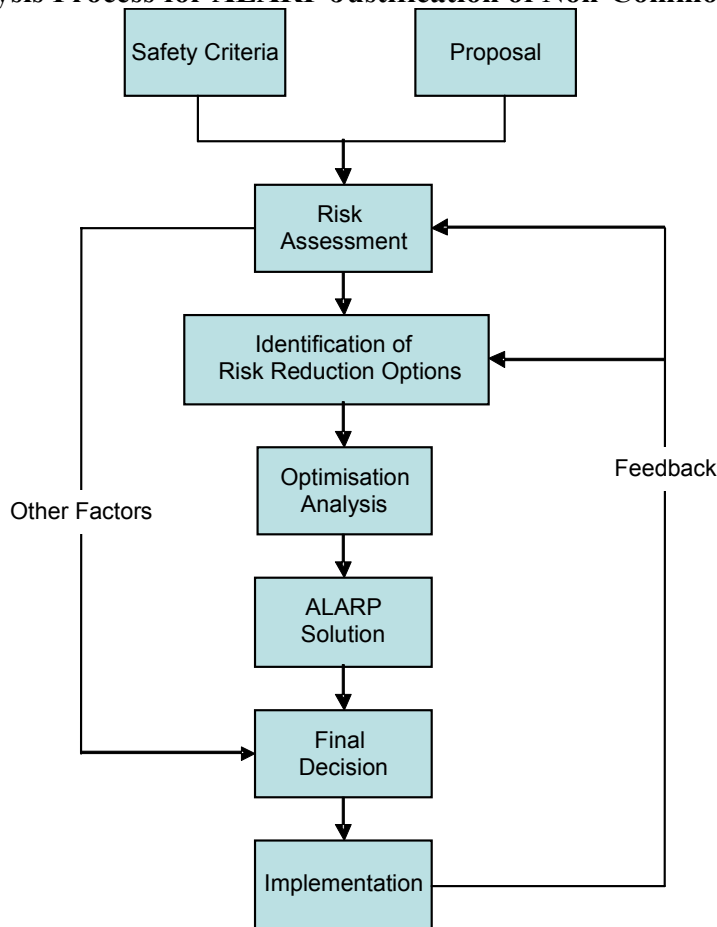
- a. Changes in assumptions or “claims” within the Safety Case;
  - b. Undertaking Safety Assessment to assess the “gaps”;
  - c. Only permitting implementation of changes following consideration of the new risks and any additional risk mitigation;
  - d. Updating the Safety Case and where necessary a new Safety Case Report before any new operation proceeds.
- 10.1.8 If an individual risk is ALARP, but lies outside of the tolerability range, then the Risk Estimation and assessment should be reviewed to confirm that the system poses intolerable risk that cannot be further mitigated. This may require radical measures such as considering redesign of some elements of the system which are preventing risk from being reduced to a tolerable level or alternatively a Modification of the Capability required from the system. Procedure SMP09 – Risk Acceptance, gives further information on what action to take if a risk cannot be driven down into the tolerable region and remains Unacceptable.
- 10.2 Tolerability Criteria**
- 10.2.1 Tolerability criteria provide the means for categorising risks as either Unacceptable, Tolerable or Broadly Acceptable. Specific tolerability criteria for a particular domain, function or accident type may be available from Safety Management Offices. Where specific tolerability criteria are not available, HSE guidance in this area should be applied. Ultimately the PSC for the project is the authority for setting tolerability criteria, but there is a need to maintain consistency across projects.
- 10.2.2 Tolerability criteria should be appropriately recorded (eg in the Safety Management Plan), and used during the remainder of the Acquisition process. Where the system is an element of a super-system, or relates to other (pre-existing) systems, the IPT leader should seek to ensure that the tolerability criteria are compatible with those of the other systems. Where existing systems have used tolerability criteria that are no longer appropriate, eg. due to changes in MOD policy, a strategy for reconciling and managing the differences should be established and agreed by the Safety Panel.
- 10.2.3 Distinct tolerability criteria may be agreed for different groups of people who may be harmed by an accident involving the system. For instance, one set of tolerability criteria may be defined for trained personnel who are directly involved with the system, another, more stringent, set of tolerability criteria may be defined for people, such as MOD employees, who are indirectly involved with the system during the course of their duties. A third set, more stringent still, may be defined for people who are independent third parties, such as the general public.
- 10.2.4 The tolerability criteria should be devised such that both individual risks (ie risks posed by individual accidents) and the overall risk posed by the system can be assessed.
- 10.3 ALARP Procedure**

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- 10.3.1 ALARP (As Low As Reasonably Practicable) is a shorthand term to indicate that all steps have been taken to reduce risks from accidents, unless the cost is grossly disproportionate. For assessment purposes, ALARP is interpreted as the reduction of risk to the lowest level practicable bearing in mind the benefits flowing from the acceptance of the risk and taking into account the cost of further reducing the risk.
  
- 10.3.2 **Stage 1 – Application of Good Practice to Common Risks:** The first stage of demonstrating ALARP is to identify all hazards that are addressed by application of good practice. This situation will apply particularly to occupational hazards such as electrocution, lifting, working at height, radiation hazards, etc. Adopting relevant good practice removes the need (but not the legal duty) to document detailed analysis of individual risk, costs, technical feasibility and the acceptability of residual risk, since these will also have been considered when the good practice was established.
  
- 10.3.3 Note however that a universal practice in industry may not necessarily be good practice or reduce risks ALARP in a specific case. Furthermore good practice may change over time; for instance a new technology may make a higher standard reasonably practicable.
  
- 10.3.4 **Stage 2 – Application of Analysis to Non-Common Risks:** Where some hazards are not addressed by application of good practice, it is necessary to systematically analyse the design to see if further risk reduction is reasonably practicable.
  
- 10.3.5 For most military systems, good practice is unlikely to cover all the risks that need to be addressed in order to demonstrate that a system is tolerably safe, especially relating to functional hazards. In this case, cost-benefit analysis of potential changes needs to be systematically undertaken. Costs can be balanced against the ‘value of prevention of a fatality’ (VPF), and other factors such as delay or reduction in capability. (The Department for Transport publishes VPF figures annually).

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**Figure 7.1: Analysis Process for ALARP Justification of Non-Common Risks**



10.3.6 A systematic analytical procedure to be used when demonstrating the achievement of ALARP for non-common risks is shown in Figure 7.1 above. The characteristics are:-

- a. **A Risk Assessment.** A predictive Risk Assessment may be required at various stages of the ALARP analysis process, for example:
  - i. an assessment of the initial proposal can be used to determine its position relative to the defined safety criteria,
  - ii. if more than one option is identified, an assessment of each option will be required to feed into the optimisation analysis,
  - iii. an assessment will need to be made of the chosen solution.
- b. **Identification of Options.** This is the fundamental stage in the ALARP analysis process and involves defining the various courses of actions, or options, available and identifying possible risk reduction measures. Measures to reduce the risk include the following:
  - i. elimination of hazards leading to risk,
  - ii. reduction in the frequency of initiating events (eg improvements in plant, site services reliability or availability),

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iii. improvement in the reliability, availability or responsibility of systems and equipment,

iv. possible introduction of new/additional systems and equipment to mitigate consequences of a hazard or improve reliability of safety/containment systems,

v. improvement in operator procedures and/or alarms to facilitate correct operator action,

vi. improvements in emergency response procedure,

vii. increase in separation, segregation and diversification of safety related equipment.

c. **Optimisation Analysis.** In order to be able to choose between different options or to judge whether or not a particular risk reduction measure makes the risk ALARP, some comparison and selection process is required. In some cases, particularly practical problems at the operational stage, a decision using engineering judgement and common sense based on experience may be all that is needed. In more complex operational situations and at the design stage the decision making process will normally have broader scope and may require a quantitative decision-aiding technique. The two main decision-aiding techniques in general use are decision analysis, and cost benefit analysis (See below). These techniques can be used for guidance but any other relevant factors, including non-safety factors, should be taken into account.

d. **Safety Justification.** The discussion of ALARP within the safety justification should be sufficient to demonstrate that a logical and comprehensive approach has been adopted to identify all candidate risk reduction measures, and to optimise these. In this way the route from the identification of measures at the ALARP review stage to the final choice of the preferred measures is clear, as is the rationale for choosing these measures in preference to others. The level of detail included for a given measure need not be extensive where the acceptance or rejection of that measure is clear. However, where a number of alternative measures exist, sufficient detail should be included in the safety justification to support the decision in favour of the measure ultimately selected.

e. **Feedback.** The final stage of the ALARP analysis process will be the implementation of the chosen design option or operational procedure. It is important that lessons learnt from the implementation be fed back to given improvements either in the next application or in other similar proposals. Similarly, any incidents or failures that are experienced should be fed back into future Risk Evaluations as appropriate.

10.3.7 Decision analysis can be used when there are numerous factors which may affect the optimum solution or when some of the factors are difficult to quantify in monetary terms. Each factor is attributed a weighting to express its relative importance. Each option is assigned a score against each factor. The score is multiplied by the weighting to produce a weighted score against each factor and the sum of the weighted scores for each option calculated. The option having the highest score will

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be the preferred solution.

10.3.8 Cost-benefit analysis (CBA) can be used where the only relevant factors are cost and risk. It is applicable where a judgement needs to be made between the benefit to be derived from a measure which reduces the risk and the cost of that measure. Affordability is not a legitimate factor in considering costs but the projected use or remaining life of a system or facility could be taken into account. CBA requires that a monetary value be assigned to the detriment (the VPF) to enable the net benefit to be quantified in the same units as the total cost of the measure.

10.3.9 The value of the VPF is an area of some debate. For the purpose of Risk and ALARP Evaluation, a value of about £1,000,000 could be used, together with a suitably pessimistic estimate of the number of fatalities. However, this is an emotive subject and no authoritative guidance is available.

10.3.10 In many practical instances, risk reduction measures have been introduced which have involved expenditure of considerably more than this. In these cases other factors (eg the measure is already common practice elsewhere) or other indirect benefits (eg maintenance of good industrial relations or reputation) which are difficult to quantify have been taken into account in reaching the final decision. Cost-benefit analysis is therefore best used when comparing a number of options in order to grade them in terms of value for money, rather than using it as the sole tool for rejection or acceptance of a particular measure.

10.3.11 Further information on ALARP can be found in Def Stan 00-56 Issue 4 Part 2 Annex B.

**10.4 Domain-Specific Guidance and References**

10.4.1 Additional guidance on Risk and ALARP Evaluation is contained in the following references:

- a. Land Systems: JSP 454 Issue 4:
  - i. Part 1 Section 4.2
- b. Ship Safety Management: JSP 430 Issue 3:
- c. Airworthiness: JSP 553 1st Edition:
  - i. Chapter 1 (1.40)
- d. Ordnance, Munitions & Explosives (OME): JSP 520 Issue 2.0:
  - i. Chapter 1 (0105-0106)
  - ii. Chapter 3 (0307)
- e. Nuclear Propulsion: JSP 518 Issue 1.2
  - i. Appendix J to Annex A

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**10.5 Chapter 6 (0605) Guidance for Different Acquisition Strategies**

10.5.1 The requirements for Risk and ALARP Evaluation do not change for Acquisition conducted through intergovernmental agreements, OCCAR, multilateral or collaborative programmes. It is MOD policy that the same standards are met, and that assurance that these standards have been met can be demonstrated.

**10.6 Warnings and Potential Project Risks**

10.6.1 Acceptance of risks on an ALARP basis must not be justified on the basis of project budget limitations.

10.6.2 Setting of the Tolerability Criteria is clearly critical to the Risk and ALARP Evaluation process. Judgement may be involved, and there is therefore some subjectivity (particularly in qualitative criteria). There is thus a temptation to address a failure to meet criteria by changing the criteria first. This should be resisted, particularly where a feasible risk reduction option is available, since the project may be failing its ALARP duty.

10.6.3 Risk and ALARP Evaluation may take place at various stages in the project, for example to support the various issues of Safety Case reports. In the Demonstration and Manufacturing phases it is likely that the Assessment effort will be provided by the Contractor. Project Safety Managers need to monitor that the results of trials and tests are examined carefully and confirm or otherwise earlier assessments of tolerability, and the assumptions on which they were based.

10.6.4 Unless the PSC actively seek Risk Reduction measures, ALARP can only be claimed through compliance with good practice. This may be a weak and inappropriate justification in many cases.

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**0 SHOWING CONFORMANCE**

**0.1 Options**

0.1.1 There are four options to demonstrate conformance when applying this system procedure:

- a. Follow the defined system procedure using the recommended guidance and tools, including allowed variations and options.
- b. Use an equivalent process and tool set generated elsewhere and document evidence of procedural equivalence.
- c. Use a bespoke process and tool set for the project and document how the bespoke procedure achieves the objectives defined for this system procedure.
- d. Where the procedure is considered to be not relevant, document the basis for this decision.

**1 INTRODUCTION**

1.1.1 **Risk Reduction** is defined in Def Stan 00-56 Issue 4 as:  
 “The systematic process of reducing risk.”

1.1.2 **Risk Reduction** is carried out throughout the project, in that efforts should be made at every stage to reduce the risks associated with any recognised hazard. This procedure focuses on risk reduction where Risk Evaluation (Procedure SMP07 – Risk and ALARP Evaluation) has shown that risks do not meet tolerability criteria, and therefore action is required.

1.1.3 The preferred means of eliminating or reducing risk is through design rather than reliance on means such as training and procedures, warning notices or operational limitations for managing residual risks.

1.1.4 **Risk Reduction** seeks to answer the question:  
 “How can we reduce the level of Safety Risk posed by the identified Accidents, individually and in total?”

1.1.5 This procedure covers the identification and selection of Risk Reduction options, as well as their implementation through changes to the design and the arrangements which will support it through life.

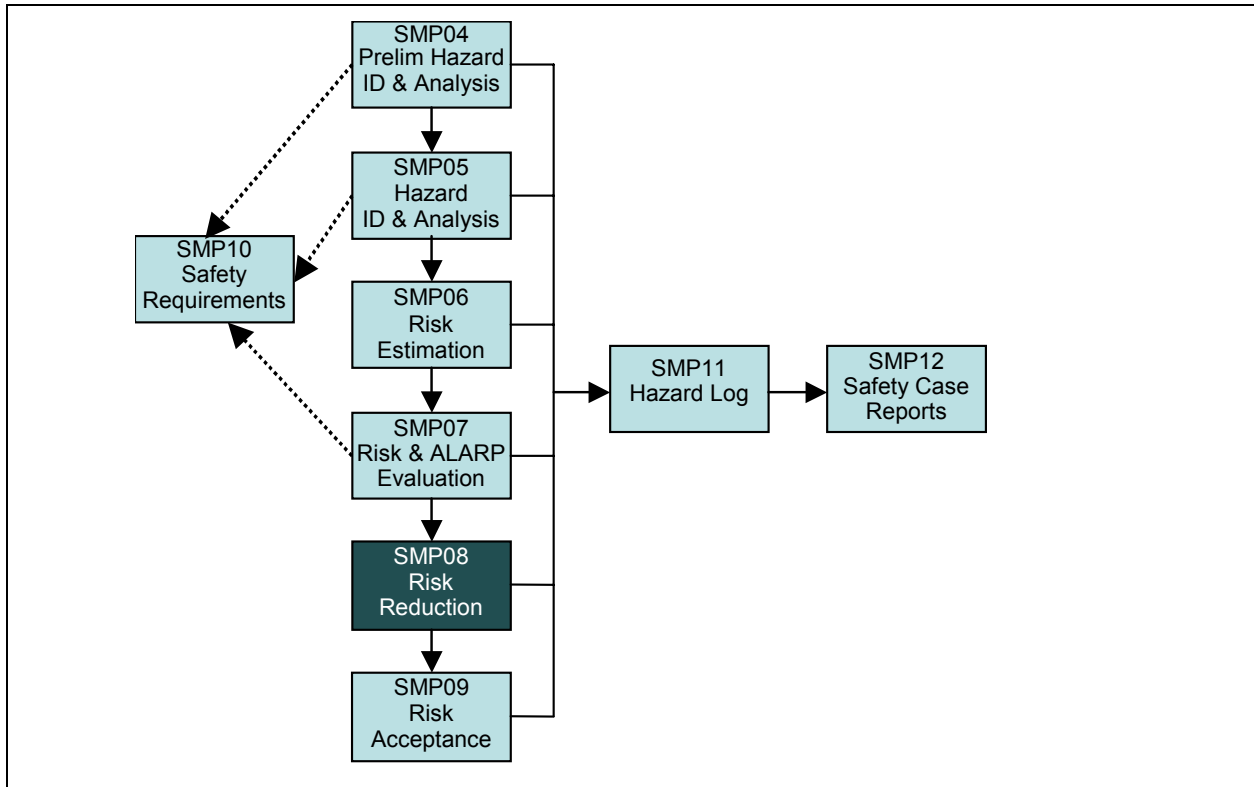
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<b>2</b>	<p><b>PROCEDURE OBJECTIVES</b></p> <p>2.1.1 The objective of Risk Reduction is to reduce the likelihood and/or consequences of specific Hazards and Accidents so that the resultant risks can be re-assessed to be Tolerable and ALARP and then Accepted after appropriate management review. It provides input to:</p> <ul style="list-style-type: none"> <li>a. Risk Estimation and Evaluation;</li> <li>b. Hazard Log;</li> <li>c. Safety Case;</li> <li>d. Risk Acceptance.</li> </ul>
<b>3</b>	<p><b>RESPONSIBILITIES</b></p> <p><b>3.1 Accountability</b></p> <p>3.1.1 The IPTL is accountable for the completion of this procedure.</p> <p><b>3.2 Procedure Management</b></p> <p>3.2.1 The IPTL may delegate the management of this procedure to a member (Safety Manager) or members of the IPT.</p> <p><b>3.3 Procedure Completion</b></p> <p>3.3.1 The Project Safety Manager will be responsible for the completion of the procedure. However, in most cases a large part of the detailed work will be carried out by contractors. The Project Safety Manager should monitor the scope and progress of this work.</p> <p>3.3.2 In large or complex projects, the Project Safety Manager must co-ordinate Risk Reduction across the project to ensure that a consistent and coherent approach to achieving and documenting Risk Reduction is adopted by all parties.</p> <p>3.3.3 The Project Safety Manager must also maintain the Project Risk Register up to date in respect of any emerging requirements for Risk Reduction activities, where these may affect project performance or costs.</p>
<b>4</b>	<p><b>WHEN</b></p> <p><b>4.1 Production</b></p> <p>4.1.1 Risk Reduction will take place whenever Risk and ALARP Evaluation identifies an Accident whose risk is either not broadly acceptable or not tolerable and ALARP. Normally this will occur during Assessment, Demonstration or Manufacture, but it will also apply to new Hazards identified in-service.</p>

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<b>4.2</b>	<b>Review, Development and Acceptance</b>
4.2.1	Risk Reduction activities carried out by Contractors will be reviewed by the Project Safety Manager.
<b>5</b>	<b>REQUIRED INPUTS</b>
5.1.1	This procedure for Risk Reduction requires inputs from: <ul style="list-style-type: none"> <li>a. Outputs from Procedure SMP03 – Safety Planning;</li> <li>b. Outputs from Procedure SMP04 – Preliminary Hazard Identification and Analysis;</li> <li>c. Outputs from Procedure SMP11 –Hazard Log;</li> <li>d. Outputs from Procedure SMP12 –Safety Case and Safety Case Report;</li> <li>e. Outputs from Procedure SMP05 –Hazard Identification and Analysis;</li> <li>f. Outputs from Procedure SMP06 –Risk Estimation;</li> <li>g. Outputs from Procedure SMP07 –Risk and ALARP Evaluation.</li> </ul>
5.1.2	The Risk Reduction may use the following reference inputs, as available: <ul style="list-style-type: none"> <li>a. Tolerability Criteria;</li> <li>b. SRD;</li> <li>c. Design information;</li> <li>d. Operation and Maintenance information;</li> <li>e. Accident and incident history from relevant existing systems in service.</li> </ul>
<b>6</b>	<b>REQUIRED OUTPUTS</b>
6.1.1	The primary outputs of the Risk Reduction are changes to the system or the supporting SMS which can reduce the Risk of identified Accidents.
<b>7</b>	<b>DESCRIPTION</b>
7.1.1	Where Risk Evaluation indicates that a risk does not meet tolerability criteria, measures should be put in place to reduce the probability of the hazard resulting in an accident by breaking the accident sequence or reducing the consequences by controlling the accident that occurs. These measures should be recorded in the Hazard Log and arguments justifying the claim made in the Safety Case.
7.1.2	The diagram below shows how Risk Reduction relates to other elements of Risk Management in the Safety Management System.

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**7.2 Method**

7.2.1 Where the risk from the system is assessed not to meet the tolerability criteria, the Project shall ensure that Risk Reduction is carried out by identifying and implementing a combination of mitigation strategies until the tolerability criteria are met. Mitigation strategies shall be selected according to the following precedence:

- a. Eliminate the hazard.
- b. Reduce the risk associated with the hazard or accident by implementing engineered mitigation strategies.
- c. Reduce the risk associated with the hazard or accident by implementing mitigation strategies based on human factors.

7.2.2 The Project shall demonstrate the effectiveness of the process for identifying and selecting mitigation strategies.

7.2.3 In some cases the mitigation strategies will include new safety requirements (for example new protective functions to be designed in). The Project shall identify the safety requirements that realise the selected mitigation strategies, and ensure that where necessary these are incorporated into the overall safety requirements (see Procedure SMP10 – Safety Requirements and Contracts) and TLMP where appropriate. The Project shall ensure that records are maintained to show traceability between hazards and accidents, and the associated safety requirements.

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7.2.4 If, after a risk has been reduced to a level that is ALARP, it is still unacceptable, the IPT Leader shall advise the Capability Customer and Equipment User that the Department is taking on board residual risk that is greater than should be tolerated. Procedure SMP09 defines the actions necessary for Unacceptable risks.

**8 RECORDS AND PROJECT DOCUMENTATION**

- 8.1.1 Where relevant, the outputs from this procedure should feed into the following:
- a. SRD (System Requirements Document) – for any specific Safety requirements;
  - b. CSA (Customer Supplier Agreement) – to document agreements on Safety information to be delivered by the IPT;
  - c. TLMP (Through Life Management Plan);
  - d. Safety elements of Initial Gate and Main Gate submissions.
- 8.1.2 The process of Risk Reduction should be recorded through the Hazard Log. This will document in detail the audit trail of what Risk Reduction measures were considered and evidence of their implementation, or record the justification of why they were considered either not practicable or not reasonable to adopt.
- 8.1.3 The Safety Case Report will summarise the Risk Reduction process and include evidence that the reduction has been effective in achieving the tolerability criteria. Also, the Safety Case Report should clearly identify any associated Residual Risks which are not considered to be ALARP.

**9 RECOMMENDED TOOLS AND FORMS**

- 9.1.1 The process of Risk Reduction requires review by stakeholders to identify, consider and implement, where necessary, options for reducing risk. The results of the review must be recorded in the Hazard Log.
- 9.1.2 The identification of Risk Reduction options requires imaginative thinking which may best be conducted in “brainstorming” sessions for the stakeholders. A Risk Reduction checklist such as that provided in Guidance Sheet SMP08/G/01 (Risk Reduction Checklist) of this procedure may be used to guide the brainstorming.

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**10 GUIDANCE**

**10.1 General**

10.1.1 There are two possible means of achieving Risk Reduction – a reduction in the probability of an accident occurring and/or a reduction in the severity of the consequences of an accident. Strategies to achieve either or both of these should follow the precedence set down in Section 7. Different domains and technology areas often have different detailed interpretations of this list:

- a. Eliminate the Hazard, possibly by re-specification or re-design of the system.
- b. Incorporation of safety features, extra functions or sub-functions to reduce the probability of occurrence of the event. These features may include redundancy, fall-back modes of operation etc.
- c. Revision of operating and training procedures to reduce the probability of error by increasing manning or skill levels, by re-allocating functions or by introducing independent review/checking. Analysis of the effects of operating and training procedures carried out as part of Hazard Analysis should be updated. It should be noted that changes to operating procedures and training will be elements of many risk reduction measures.
- d. Incorporation of warning devices. Where it is not possible to apply one of the above methods, warning devices may be introduced. However, when assessing the revised predicted probabilities, the likelihood of human error in a stressful or unusual situation should be carefully considered.

10.1.2 Due regard should be taken of human fallibility wherever a mitigation strategy is implemented through a human being. The failure rate apportioned to the human being in a particular situation should be based on actual experience of the same or similar tasks under the same or similar conditions where that exists. Any use of human failure rates should be supported by a demonstration of the validity of the rates being used.

10.1.3 The selection or rejection of mitigation strategies is not a trivial activity. The Project should demonstrate in the Safety Case Report that all feasible mitigation strategies have been considered in sufficient detail to be able to make meaningful judgements about what is reasonably practicable. The Project should also demonstrate that mitigation strategies have been considered sufficiently early in the design process to allow the design to be modified.

10.1.4 For any mitigation strategy that is employed, the effect on the system should be carefully considered. This should involve re-assessment to review the effect of the mitigation strategy on the system, to see if any new hazards have been introduced which require further examination, or if any existing hazards have been affected. Details of any new hazards or changes to the status of an existing hazard should be recorded in the Hazard Log.

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10.1.5 Should there be no apparent way of meeting the tolerability criteria, the Contractor should immediately inform the Project Safety Manager. If there are exceptional circumstances, the risk may be accepted in consultation with the relevant regulatory/certification bodies and/or senior management. Such events should be fully documented in the Hazard Log and Safety Case and justified in terms of the maintenance or optimisation of defence capability. See also responsibilities above.

**10.2 Alignment with Environment**

10.2.1 The key alignment opportunity in SMP08 is to ensure wherever possible that Risk Reduction measures cover both safety and environmental control of common issues.

**10.3 Domain-Specific Guidance and References**

10.3.1 Additional guidance on Risk Reduction is contained in the following references:

- a. Land Systems: JSP 454:
- b. Ship Safety Management: JSP 430:
  - i. Section 10 Risk Reduction (10.7)
- c. Airworthiness: JSP 553 1st Edition:
- d. Ordnance, Munitions & Explosives (OME): JSP 520:
- e. Nuclear Propulsion: JSP 518
  - i. Appendix A to Annex J (AJ09, AJ12)
  - ii. Appendix A to Annex K (AK10, AK11)

**10.4 Guidance for Different Acquisition Strategies**

10.4.1 The requirements for Risk Reduction do not change for Acquisition conducted through intergovernmental agreements, OCCAR, multilateral or collaborative programmes. It is MOD policy that the same standards are met, and that assurance that these standards have been met can be demonstrated.

**10.5 Warnings and Potential Project Risks**

10.5.1 Risk reduction strategies relying on warning signs or signals are unlikely to be sufficient for risks associated with high consequence accidents. Design solutions are greatly preferable.

10.5.2 Once a Risk Reduction option has been identified and before it is implemented, it should be assessed to ensure that it does not introduce additional Hazards or increase the risks of existing hazards. After implementation, it should be monitored to ensure that it continues to be effective.

10.5.3 If Risk Reduction is not considered sufficiently early in the project life cycle, certain options may be closed off. The cost of implementing design changes and impact on Project timescales become more and more significant.

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- 10.5.4 If the correct authorities are not consulted, then not all Risk Reduction options may be identified for consideration. Furthermore, the practicability and reasonableness of potential Risk Reduction options may not be judged correctly and an invalid ALARP argument or non-optimal Safety may result.
- 10.5.5 If potential Risk Reduction measures are not actively sought, then it will not be possible to claim ALARP, except on the basis of compliance with recognised good practice.

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<b>Guidance Sheet SMP08/G/01 – Risk Reduction Checklist</b>
<p>The following paragraphs present a generic checklist for use in identifying options for reducing the risks associated with Hazards and Accidents relating to a system. Any such checklist must be used in a “brainstorming”, imaginative way to stimulate discussions between stakeholders who have a good understanding of the system, its context and usage/maintenance environment. Checklists application in a narrow way or by those with an incomplete appreciation of the system will be very much less effective.</p> <p>The checklist is for use in considering specific Hazards and Accident sequences identified for the system of interest. Safety Management requires that the Project development must also be subject to overarching good practices, including:</p> <ol style="list-style-type: none"> <li>a. Quality;</li> <li>b. Configuration Management;</li> <li>c. Design Reviews;</li> <li>d. Independent Review;</li> <li>e. Closed-loop problem reporting and resolution;</li> <li>f. Use of Suitably Qualified and Experienced Personnel (SQEP);</li> <li>g. Focus on Safety Culture.</li> </ol> <p><b>Order of Precedence for Risk Reduction Strategies</b></p> <ol style="list-style-type: none"> <li>1. Eliminate the Hazard, possibly by re-specification or re-design of the system;</li> <li>2. Incorporation of safety feature;</li> <li>3. Incorporation of warning devices;</li> <li>4. Operating and training procedures;</li> <li>5. Warning signs and notices.</li> </ol> <p><b>1. Hazard Elimination Strategies:</b></p> <ol style="list-style-type: none"> <li>a. Eliminate the Hazardous substance or procedure;</li> <li>b. Achieve the required capability by a different means;</li> <li>c. Reduce the performance required.</li> </ol> <p><b>2(a). Incorporate Safety Features Strategies (Hazard Controls):</b></p> <ol style="list-style-type: none"> <li>a. Passive control – process inherently cannot run-away (laws of physics etc);</li> <li>b. Hazard detection and automatic shutdown (eg trip systems, circuit breakers);</li> <li>c. “Friendly design” such as:                     <ol style="list-style-type: none"> <li>i. Smooth control system response;</li> <li>ii. Tolerance of mal-operation (design for recovery);</li> <li>iii. Inability to mis-assemble;</li> <li>iv. Design for disposal/dismantling;</li> <li>v. Clear status visible on system components (eg valves);</li> </ol> </li> </ol>

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- d. Increased Integrity of Safety functions, through:
  - i. Redundancy<sup>1</sup>;
  - ii. Diversity (different technology to achieve same function);
  - iii. Failsafe design<sup>2</sup>;
  - iv. System monitoring (including Health and Usage Monitoring);
  - v. Reallocate function to a different technology;
  - vi. Increased Safety factors or margins;
  - vii. Increased Reliability through stress de-rating;
  - viii. Increased Reliability through improved component quality (including stress screening)
  - ix. Increased Reliability through improved maintenance;
  - x. Improved design for Human Factors for human Safety functions.
- e. Increased integrity of Safety functions realised in software, through:
  - i. Error detecting/correcting codes (eg parity or CRC check, hamming codes);
  - ii. Full diversity (different software language running on different technology processor);
  - iii. Software diversity<sup>3</sup> (not full diversity as same processor is used);
  - iv. Defensive programming (ensure that variables cannot go out of range);
  - v. Graceful degradation (if there are insufficient resources, prioritise functions and perform high priority ones);
  - vi. Exception handling/error trapping. Trap run-time errors, then fail safe or reset<sup>4</sup>;
  - vii. Watchdog<sup>5</sup>.
- f. Physical protection measures such as barriers, shields, firewalls, blastwalls, guards, enclosures, interlocks, lock-off systems, exclusion zones, special atmosphere;
- g. Remove people from Hazardous area (include making system remotely operated);
- h. Reduce number of people exposed to Hazard;
- i. Relocate Hazard away from other activities;
- j. Controlled entry to Hazardous areas;
- k. Automate certain functions or procedures;
- l. Reduce Hazard in scale, eg:
  - i. Substitute with a less Hazardous replacement (eg alternative substance, alternative technology);
  - ii. Reduce inventory of Hazardous material;
  - iii. Reduce Hazardous aspect (eg energy, pressure, voltage, temperature, height, speed, toxicity);
- m. Attenuation – use material in least Hazardous form (eg slurry not dust);
- n. Reduce usage rate of Hazardous aspect or frequency of Hazardous activity<sup>6</sup>;
- o. Special handling/support equipment or facilities;
- p. Weak points/relief systems (eg fuses, Pressure Relief Valves, bursting discs);

<sup>1</sup> Must also consider vulnerability to dependent failures.  
<sup>2</sup> Must consider all failure modes and wartime operation if relevant  
<sup>3</sup> Implementing the same function in software two or more times on the same processor and using voting  
<sup>4</sup> Often switched off because code runs too slowly.  
<sup>5</sup> A process dedicated to monitoring the critical process, resets the critical process if it fails.  
<sup>6</sup> Must beware of loss of skills.

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- q. Design for preferential lower severity failure mode (eg pressure vessel “leak before break”);
  - r. Special coatings and treatments (eg fire-retardant, slip resistant, anti-bacterial);
  - s. Personal Protective Equipment (including harnesses);
  - t. Defence in depth (including physical measures such as containment or bunds for leakage).
- 2(b) Incorporate Safety Features Strategies (Accident Controls):**
- a. Emergency plans;
  - b. Evacuation plans;
  - c. Safe refuge;
  - d. Post-accident response;
  - e. Personal Protective Equipment (including harnesses);
  - f. First aid provision;
  - g. Fire-fighting arrangements;
  - h. Deluge/fire suppression;
  - i. Survival equipment;
  - j. Life-saving equipment.
- 3. Incorporate Warning Devices Strategies:**
- a. Alarm systems (including failsafe alarms which are normally active);
  - b. Warning buzzers, beacons and lights;
  - c. Stop lights.
- 4. Procedural Strategies:**
- a. Permit to work system;
  - b. Additional manpower to support operator during hazardous operations (eg safety man, banksman, banksman/slinger etc);
  - c. Independent review/checking of Safety-related tasks<sup>7</sup>;
  - d. Inspection or functional test for dormant failures of Safety functions;
  - e. Inspection for incipient failures of Safety functions;
  - f. Human monitoring of Hazard areas;
  - g. Hazard control procedures in specific circumstances (eg de-icing);
  - h. Increased competence of personnel (eg through selection, training);
  - i. Refresher training to retain competence;
  - j. Emergency exercises/drills to examine competence.
- 5. Warning Information Strategies** (not suitable as sole strategy for accident sequences with high severity consequences):
- a. Warning signs and notices<sup>8</sup>;
  - b. Warnings in manuals and written instructions<sup>9</sup>.
  - c. Marked Hazard areas.

<sup>7</sup> Must consider vulnerability to dependent failures.

<sup>8</sup> Use standardised symbols, implemented to minimise probability of incorrect reaction.

<sup>9</sup> Must use standard notation and language for documented warnings.

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<b>0</b>	<b>SHOWING CONFORMANCE</b>
<b>0.1</b>	<b>Options</b>
0.1.1	There are four options to demonstrate conformance when applying this system procedure: <ul style="list-style-type: none"> <li>a. Follow the defined system procedure using the recommended guidance and tools, including allowed variations and options.</li> <li>b. Use an equivalent process and tool set generated elsewhere and document evidence of procedural equivalence.</li> <li>c. Use a bespoke process and tool set for the project and document how the bespoke procedure achieves the objectives defined for this system procedure.</li> <li>d. Where the procedure is considered to be not relevant, document the basis for this decision.</li> </ul>
<b>1</b>	<b>INTRODUCTION</b>
1.1.1	<b>Risk Acceptance</b> is defined Def Stan 00-56 Issue 4 as:  “The systematic process by which relevant stakeholders agree that risk may be accepted.”
1.1.2	<b>Risk Acceptance</b> is the final stage in risk management. Once risks have been assessed against requirements (Procedure SMP07 – Risk and ALARP Evaluation) and reduced where necessary (Procedure SMP08 – Risk Reduction), it is necessary to agree that sufficient evidence has been provided that the tolerability/ALARP criteria have been met.
1.1.3	There must be review at appropriate management level of each individual risk (and the aggregated risk for the system) before the Safety Case Report is finalised for major milestones. Completion of this procedure is a prerequisite for acceptance and signature of the Safety Case Report by the IPT Leader.
1.1.4	<b>Risk Acceptance</b> will occur only when there are positive answers the questions:  “Have we done all that is Reasonably Practicable to reduce the level of Safety Risk posed by the identified Accidents, individually and in total?”  and  “Are they now Broadly Acceptable or Tolerable and As Low As Reasonably Practicable?”

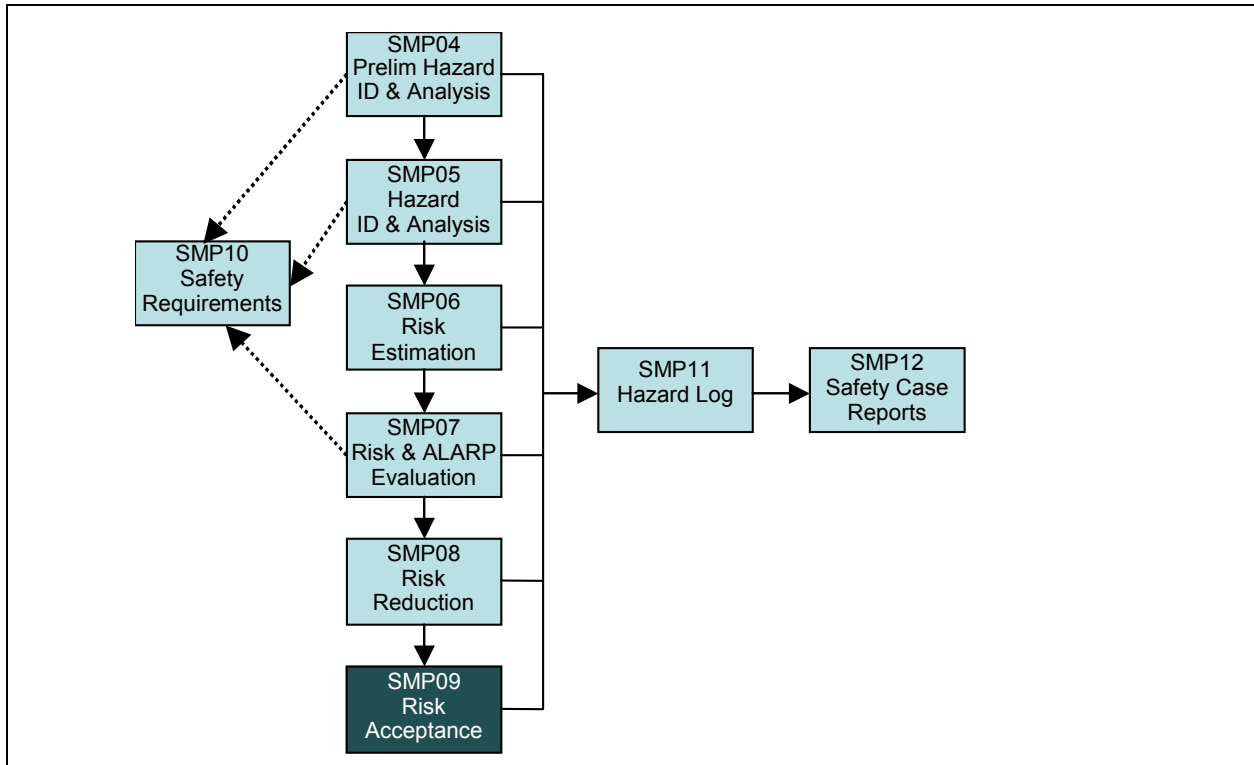
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<b>2</b>	<b>PROCEDURE OBJECTIVES</b>	<p>2.1.1 The objective of Risk Acceptance is to ensure that every risk has been reviewed at appropriate management level prior to authorisation of the Safety Case Report by the IPT Leader. (Note “authorised” is used in accordance with the definitions in SMP12 – Safety Case and Case Report).</p>
<b>3</b>	<b>RESPONSIBILITIES</b>	
<b>3.1</b>	<b>Accountability</b>	
3.1.1		The IPTL is accountable for the completion of this procedure.
<b>3.2</b>	<b>Procedure Management</b>	
3.2.1		The IPTL may delegate the management of this procedure to a member (Safety Manager) or members of the IPT.
<b>3.3</b>	<b>Procedure Completion</b>	
3.3.1		The Project Safety Manager and PSC will be responsible for the completion of the procedure. However, in most cases a large part of the detailed evidence will be provided by contractors. The Project Safety Manager is responsible for approving this work as carried out to appropriate levels of detail, accuracy and completeness.
3.3.2		The IPT Leader is responsible for formally documenting the acceptance of the residual risk of the system by the appropriate authority. The IPT Leader should ensure that this residual risk and the associated hazards are updated to reflect changes/modifications in the system or its use. The IPT Leader and PSC should jointly determine the updated residual risk prior to acceptance of the risk and system hazards.
<b>4</b>	<b>WHEN</b>	
<b>4.1</b>	<b>Production</b>	
4.1.1		Risk Acceptance is an ongoing process by which all the individual risks in the Hazard Log are reviewed at appropriate management level where claims of tolerability and ALARP are to be made.
<b>4.2</b>	<b>Review, Development and Acceptance</b>	
4.2.1		Each major update shall be endorsed by the Safety Panel, authorised by the Project Safety Manager and accepted by the IPT Leader.
4.2.2		If the evidence supporting Risk Acceptance is updated, management measures should ensure that the Hazard Log, Safety Case Report and other dependent activities are also updated.

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<b>5</b>	<b>REQUIRED INPUTS</b>	<p>5.1.1 This procedure for Risk Acceptance requires inputs from:</p> <ol style="list-style-type: none"> <li>a. Outputs from Procedure SMP03 – Safety Planning;</li> <li>b. Outputs from Procedure SMP04 – Preliminary Hazard Identification and Analysis;</li> <li>c. Outputs from Procedure SMP11 –Hazard Log;</li> <li>d. Outputs from Procedure SMP12 –Safety Case and Safety Case Report;</li> <li>e. Outputs from Procedure SMP05 –Hazard Identification and Analysis;</li> <li>f. Outputs from Procedure SMP06 –Risk Estimation;</li> <li>g. Outputs from Procedure SMP07 –Risk and ALARP Evaluation;</li> <li>h. Outputs from Procedure SMP08 –Risk Reduction.</li> </ol> <p>5.1.2 The Risk Acceptance process and timing appropriate to the project will be defined in the Project Safety Management Plan, if necessary with reference to the Contractor’s Safety Management Plan.</p> <p>5.1.3 The Risk Acceptance may use the following reference inputs, as available:</p> <ol style="list-style-type: none"> <li>a. Hazard Log;</li> <li>b. Risk Evaluations;</li> <li>c. Detailed evidence supporting the Risk Evaluations;</li> <li>d. ALARP justifications;</li> <li>e. ISA Report(s)</li> <li>f. Safety Requirements in SRD and Contractual Documents.</li> </ol>
<b>6</b>	<b>REQUIRED OUTPUTS</b>	<p>6.1.1 The primary output of the Risk Acceptance is the endorsement at appropriate management level of the evidence of tolerability and ALARP for each Accident recorded in the Hazard Log.</p>
<b>7</b>	<b>DESCRIPTION</b>	<p>7.1.1 The diagram overleaf shows how Risk Acceptance relates to other elements of Risk Management in the Safety Management System.</p>

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7.1.2 Risk Acceptance takes place after completion of Risk and ALARP Evaluation and Risk Reduction and prior to authorisation of the Safety Case Report by the IPT Leader. However, if some of the risks cannot be accepted, then there may be a need to re-enter the Risk Reduction cycle.

**7.2 Method**

7.2.1 Individual risks, and the overall risk posed by the system, may be accepted when the PSC and Project Safety Manager agree that sufficient evidence has been provided that the tolerability criteria have been met.

7.2.2 The Project Safety Manager shall agree with the Stakeholders a process for Risk Acceptance. The process should ensure that the detailed evidence produced by the contractor is aligned against the hazards listed in the Hazard Log in a way that supports visibility and review by the appropriate management level according to risk category.

7.2.3 There are defined processes for acceptance of risks within each domain (ie ship key hazards, airworthiness, OME, etc) which must be followed for these risks, even if the project as a whole is primarily in a different domain.

**8 RECORDS AND PROJECT DOCUMENTATION**

8.1.1 Where relevant, the outputs from this procedure should feed into the following:

- a. SRD (System Requirements Document) – for any specific Safety requirements;

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- b. CSA (Customer Supplier Agreement) – to document agreements on Safety information to be delivered by the IPT;
  - c. TLMP (Through Life Management Plan);
  - d. Safety elements of Initial Gate and Main Gate submissions.
- 8.1.2 Risk Acceptance will be documented through the Hazard Log and Safety Case Report.

**9 RECOMMENDED TOOLS AND FORMS**

9.1.1 The process of Risk Acceptance is one of review and, as such, has no specific tools, although the input and output for the review will both be in the Hazard Log.

9.1.2 Guidance Sheet SMP09/G/01 - Management Level for Acceptance of Risk, provides an example Table showing the management level at which Accidents of different risk significance can be endorsed.

**10 GUIDANCE**

10.1.1 The process for risk acceptance should address how the sufficiency and adequacy of the evidence will be demonstrated. Agreement that the Tolerability Criteria have been met, and that the risk has been reduced to a level that is ALARP, will be the minimum requirement. The agreement is between the Contractor, the Project Safety Manager and the Safety Panel, but, in many cases both parties will need to take due cognisance of outside bodies eg regulatory/certification bodies and users.

10.1.2 The process for risk acceptance should be agreed at an early stage in the project and should be included in the Safety Plan. Discussions should involve the Contractor's, and the MOD's, safety advisors; the Safety Panel; and representatives from any regulatory/certification bodies.

10.1.3 In practice Risk Acceptance may be an ongoing process as individual Hazards are resolved and evidence of this becomes available. This obviously reduces the risks to timescale and the peak workload on the Safety Panel. However care must be then taken to ensure that later changes and modifications do not invalidate previous Risk Acceptance. This requires effective change control and visibility of the impact of changes on hazards.

**10.2 Domain-Specific Guidance and References**

10.2.1 Additional guidance on Risk Acceptance is contained in the following references:

- a. Land Systems: JSP 454 Part 2:
  - i. Annex D – Compliance with Legislation: In the Land Systems Sector Projects are required to complete a Compliance Table to demonstrate in a traceable way that the solution complies with all relevant Legislative

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requirements.

- ii. Appendix 1 to Annex D – Legislation Compliance Table

- b. Ship Safety Management: JSP 430 Issue 3:
- c. Airworthiness: JSP 553 1st Edition:
  - i. Annex P Safety Management System (P 10) contains reference to residual risk acceptance
- d. Ordnance, Munitions & Explosives (OME): JSP 520 Issue 2.0:

**10.3 Guidance for Different Acquisition Strategies**

10.3.1 The requirements for Risk Acceptance do not change for Acquisition conducted through intergovernmental agreements, OCCAR, multilateral or collaborative programmes. It is MOD policy that the same standards are met, and that assurance that these standards have been met can be demonstrated.

**10.4 Project Risks**

10.4.1 Acceptance of risks on an ALARP basis must not be justified on the basis of project budget limitations.

10.4.2 As in all safety matters, failure to get agreement on key issues affecting the Acceptance Process at an early stage in the life cycle will often lead to problems in cost and time terms.

10.4.3 Safety Committees must resist any inclination to indulge in ever more complex calculations and analysis, which cannot be justified on time and cost grounds.

10.4.4 Risk Acceptance should not be achieved if there are significant shortcomings in the previous Risk Management activities. The Project Risks identified against Procedures SMP05 to SMP08 can result in inability to achieve Risk Acceptance.

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**Form SMP09/G/01 Management Level for Acceptance of Risk**

Level of Risk	Have the risks been shown to be ALARP ?		Management Level for Acceptance
	Yes	No	
Unacceptable	Unacceptable – unless there are exceptional reasons for the activity to take place	Unacceptable	Through explicit agreement at 2* level between Project’s TLB and Equipment User.  Agreement in writing must be referenced in the Hazard Log and included in Safety Case Report, defining the circumstances under which risk exposure is considered acceptable and explaining why.
Tolerable	Acceptable	Unacceptable	Project Safety Committee  (justification must be recorded in Hazard Log)
Broadly Acceptable	Acceptable	Acceptable – but risk should be reduced wherever reasonably practicable	Normal project reviews  (justification must be recorded in Hazard Log, Safety Committee must review Risk estimation and agree that it is broadly acceptable)

The above Table identifies the management level which can accept Risks of different levels.

In some cases, the “Tolerable” band may be split into a region identifying higher risk and one relating to lower risk. Gross disproportion (eg a factor of 10) must be shown between the cost of a risk reduction measure and its expected Safety benefits, before it can be claimed to be unreasonable to adopt this measure.

If the “Tolerable” band is split in this way, the IPT Leader may decide that risks in the upper part of the band can be accepted only after review at a management level above the Project Safety Committee (eg: an IPT Safety Committee). The Project Safety Committee would still review the risk and its associated control measures, and give the higher management level the benefit of their Stakeholder and Subject Matter Expert knowledge.

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		1

<b>0</b>	<b>SHOWING CONFORMANCE</b>
<b>0.1</b>	<b>Options</b>
0.1.1	There are four options to demonstrate conformance when applying this system procedure: <ul style="list-style-type: none"> <li>a. Follow the defined system procedure using the recommended guidance and tools, including allowed variations and options.</li> <li>b. Use an equivalent process and tool set generated elsewhere and document evidence of procedural equivalence.</li> <li>c. Use a bespoke process and tool set for the project and document how the bespoke procedure achieves the objectives defined for this system procedure.</li> <li>d. Where the procedure is considered to be not relevant, document the basis for this decision.</li> </ul>

<b>1</b>	<b>INTRODUCTION</b>
1.1.1	The two ways in which an IPT can have the greatest influence in ensuring that the system design can achieve adequate Safety performance throughout its life, are through: <ul style="list-style-type: none"> <li>a. Setting appropriate Safety Requirements;</li> <li>b. Having effective Contract(s) with competent Contractor(s) for development and support.</li> </ul>
1.1.2	A <b>Safety Requirement</b> is defined in Def Stan 00-56 Issue 4 as:  “A requirement that, once met, contributes to the safety of the system or the evidence of the safety of the system.”
1.1.3	MOD must define clearly what the system must do and what behaviour (eg: performance, reliability) it must exhibit for it to be considered adequately Safe. Only MOD can decide what levels of Safety Risk can be tolerated in different circumstances, and balance the military or other benefits of the system against these Risks.
1.1.4	The overall aim of all safety management systems is to reduce risk to a level that is tolerable and ALARP. However, with the wide variety of defence systems, safety targets or criteria are needed to provide a measurable approach to the achievement of safety. The targets may be either qualitative or quantitative, but both types need to be tailored to the individual project. Numerical values must be used with caution: they must be auditable and applicable to the project in hand.
1.1.5	Safety Requirements form the basis against which the safety of the system is tested and assessed. The activity of establishing Safety Requirements is iterative because of the iterative nature of safety analysis.

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1.1.6 This procedure defines the various forms that Safety Requirements can take and identifies when and how they should be derived. It also identifies Safety issues for inclusion in Contracts and discusses some potential Project Risks associated with inadequate Requirements and Contracts.

**2 PROCEDURE OBJECTIVES**

- 2.1.1 Deriving and recording appropriate Safety Requirements that are tailored to the system and its function will ensure that:
- a. The system design and development is influenced to achieve a level of Safety performance through life, that is tolerable and in proportion to the benefits brought by its (military) Capability;
  - b. The needs of stakeholders (eg: authorities for higher-level systems, Safety regulators and approval authorities) are recognised and addressed from the earliest stages of the Project life cycle;
  - c. System functionality that is Safety-related is recognised early in the life cycle and designed to achieve the necessary level of Performance and Integrity;
  - d. A record exists in the Safety Case to justify why the system Safety Requirements are appropriate.
- 2.1.2 Contracts which adequately cover Safety will ensure that:
- a. Safety Requirements are clearly specified;
  - b. Safety interfaces between the MOD and contractor are clearly defined;
  - c. The Risk Acceptance regime relevant to the contract is clearly specified and any MOD regulatory requirements are given proper consideration;
  - d. The contractor's safety data is provided in an auditable and acceptable form to MOD, including the IPT, FSMOs and any authorities who act as regulator or provide Safety approvals.
  - e. The contractor provides access to MOD safety authorities for audit as required.
- 2.1.3 Tender assessment and Contract negotiations should seek to ensure that the selected contractors are professionally competent to undertake the work in respect of Safety engineering and Safety Management.

**3 RESPONSIBILITIES**

- 3.1 Accountability**
- 3.1.1 The IPTL is accountable for the completion of this procedure.
- 3.2 Procedure Management**
- 3.2.1 The IPTL may delegate the management of this procedure to a member (Safety

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	Manager) or members of the IPT.
3.2.2	The IPT must ensure that appropriate Safety Requirements are developed sufficiently early in the Project life cycle.
3.2.3	As the MOD is a self-regulating organisation, its Policy requires individual IPT Leaders to make their own decisions using risk-based techniques. Safety Requirements should be developed for particular projects or activities, using the Project Safety Committee to review the target levels set for those requirements and the success in their achievement at least at agreed milestones.
3.2.4	The IPT is also responsible for the Safety content of ITTs and Contracts and will use specialist Safety and Contracts support to ensure that they are appropriate.
<b>3.3</b>	<b>Procedure Completion</b>
3.3.1	The Project Safety Manager and PSC will be responsible for the completion of the procedure. However, in many cases a large part of the detailed work underlying Safety requirements definition will be conducted by contractors during the Assessment phase.
3.3.2	The Project Safety Manager and PSC will be responsible for formally documenting the Safety requirements and justifying that they are appropriate in the Safety Case.
3.3.3	The Project Safety Manager and PSC will be responsible for generating the Safety content of ITTs and Contracts calling on specialist Contracts support as necessary.
<b>4</b>	<b>WHEN</b>
<b>4.1</b>	<b>Safety Requirements</b>
4.1.1	Every Project starts with a need to satisfy common Safety Objectives which derive from MOD Safety Policy (see Section 7.1). These are then interpreted into Project-specific terms to produce: <ul style="list-style-type: none"> <li>a. Safety Requirements in URD;</li> <li>b. Safety Requirements in SRD;</li> <li>c. Requirements for safety mitigation features required to reduce identified Risks.</li> </ul>
4.1.2	The derivation of these is an iterative process, but it must be undertaken sufficiently early in the Project life cycle to ensure that the design process is influenced and any major Project Risks (eg: of inability to achieve Requirements) are identified in a timely manner.
<b>4.2</b>	<b>Reviewing Safety Requirements</b>
4.2.1	The Safety Requirements must be reviewed to ensure that they are appropriate and complete, particularly before Authorisation of Safety Case Reports.

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4.2.2 The Safety Requirements must also be reviewed as part of the periodic Safety Case review process (see Procedure SMP12 – Safety Case and Case Report) to ensure that any missing or emergent Safety Requirements are identified. These can include:

- a. New Requirements due to changes in usage (eg: new functionality, new system context or environment);
- b. New Requirements due to emergent Legislation, both retrospectively applicable and that defining “good practice”. Note that this Legislation will include that which is directly applicable and that for comparable areas if statute does not apply to MOD;
- c. New Requirements due to changes in Safety Regulation or Safety Approvals applicable to the Project.
- d. New Requirements due to developing technology;
- e. New Requirements due to recently identified Hazards.

**4.3 Coverage of Safety in ITTs and Contracts**

4.3.1 Safety issues must be addressed in ITTs and Contracts whenever the IPT is considering using Contracted support for a function that may have an effect on Safety Management. This will obviously include System Development, Design Authority and Support, but also Trials, Documentation, Training and specialist Safety support to the IPT.

4.3.2 Safety must be addressed sufficiently well to ensure that Safety responsibilities and interfaces are understood by all parties and that the Contractor has sufficient competence in Safety to discharge their responsibilities.

4.3.3 The IPT Leader should obtain sufficient information at the tendering stage to enable a judgement to be made on the tenderers’ competence with particular regard to equipment safety management (eg require the provision of safety personnel CVs at the ITT stage). If the tendering process provides evidence that a particular contractor is not competent to carry out the work, then the bid should be deemed non-compliant and the contractor deselected.

4.3.4 The amount of safety information requested at the tender stage is dependent upon the size and complexity of the project, along with the perceived safety risks. A sample questionnaire is included in **Guidance Sheet SMP10/G/01 - Safety Topics for ITT Questionnaires**. This should be tailored to the requirements of the individual project. Ideally the tender responses should be provided in the form of a draft Contractor’s Safety Management Plan which would then be formally agreed prior to contract award.

**4.4 Demonstration of Compliance with Safety Requirements**

4.4.1 The Safety Case is the mechanism both for justifying that the Safety Requirements are appropriate and for demonstrating that they are being achieved. It is particularly important that demonstration of compliance is attained before people are exposed to Risks, for example at the time of equipment Trials or introduction to service.

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<b>5</b>	<b>REQUIRED INPUTS</b>	
5.1.1		This procedure for Safety Requirements and Contracts requires inputs from: <ul style="list-style-type: none"> <li>a. Outputs from Procedure SMP01 – Safety Initiation;</li> <li>b. Outputs from Procedure SMP04 – Preliminary Hazard Identification and Analysis;</li> <li>c. Outputs from Procedure SMP11 –Hazard Log;</li> <li>d. Outputs from Procedure SMP12 –Safety Case and Safety Case Report;</li> <li>e. Outputs from Procedure SMP05 –Hazard Identification and Analysis;</li> <li>f. Outputs from Procedure SMP06 –Risk Estimation;</li> <li>g. Outputs from Procedure SMP07 –Risk and ALARP Evaluation;</li> <li>h. Outputs from Procedure SMP08 –Risk Reduction;</li> <li>i. Outputs from Procedure SMP09 –Risk Acceptance.</li> </ul>
5.1.2		Generation of the Safety Requirements may use the following reference inputs: <ul style="list-style-type: none"> <li>a. MOD, domain and TLB Policy for Safety;</li> <li>b. Description of Capability requirements;</li> <li>c. Design description;</li> <li>d. Completed Form <b>SMP01/F/03</b> - Register of Safety Legislation and Other Significant Requirements.</li> </ul>
<b>6</b>	<b>REQUIRED OUTPUTS</b>	
<b>6.1</b>	<b>Safety Requirements</b>	
6.1.1		The primary outputs of this part of the procedure are a clear and consistent set of Safety requirements that are justified as being appropriate to the system.
<b>6.2</b>	<b>Safety Elements of ITTs and Contracts</b>	
6.2.1		The primary outputs of this part of the procedure are a clear and consistent set of Contractual terms that can be used to select and contract effectively for the required Safety Management aspects of the Project.
<b>7</b>	<b>DESCRIPTION</b>	
<b>7.1</b>	<b>Initial Safety Objectives</b>	
7.1.1		Flowing from MOD’s Safety Policy, every Acquisition Project has three main Safety Objectives:

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- a. Compliance with relevant legislation;
  - b. Achievement of safety levels at least as good as statute where legislation does not apply;
  - c. Safety Risks to be Tolerable and ALARP.
- 7.1.2 In addition to this, the Project must satisfy any relevant Safety Regulators or Approval Authorities who may have their own Requirements for system features or information.
- 7.1.3 The production of Project-specific Safety Requirements entails examination of the Capability Requirements, the context (eg. environment and interfacing systems) and the design solution, to define a complete set of Safety Requirements which will satisfy these common Safety Objectives and Approvals Requirements.
- 7.2 Definition of URD Safety Requirements**
- 7.2.1 The URD is an all embracing, structured expression of the user need for a bounded operational capability, and is the means by which the Equipment Capability Customer (ECC) develops, communicates and maintains the user's requirement throughout the life of the system. In systems engineering terms, safety is a constraint that adds quality to the required capability, and the application of safety constraints to a system may lower the risks to that system's capability. The inclusion of safety requirements in a URD is therefore the principal aspect in ensuring that the risks associated with a system are ALARP.
- 7.2.2 Safety user requirements shall include acceptance criteria (safety targets) against which the system will be assessed and accepted.
- 7.3 Deriving Safety Requirements by Preliminary Analysis**
- 7.3.1 This is the first stage of detailed safety analysis and includes setting detailed safety targets derived from the baseline criteria. It is to be carried out prior to tendering as part of the process of establishing safety requirements. The industrial Designer is to refine this safety analysis early in the development contract when more detailed design information is available.
- 7.3.2 In some cases the mitigation strategies will include new safety requirements (for example new protective functions to be designed in). The Project shall identify the safety requirements that realise the selected mitigation strategies, and ensure that where necessary these are incorporated into the overall safety requirements and TLMP where appropriate. The Project shall ensure that records are maintained to show traceability between hazards and accidents, and the associated safety requirements.

**8 RECORDS AND PROJECT DOCUMENTATION**

8.1.1 Where relevant, the outputs from this procedure should feed into the following:

- a. SRD (System Requirements Document) – for any specific Safety requirements;
- b. CSA (Customer Supplier Agreement) – to document agreements on Safety

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information to be delivered by the IPT;

- c. TLMP (Through Life Management Plan);
- d. Safety elements of Initial Gate and Main Gate submissions.

**8.2 Safety Requirements**

8.2.1 The Safety Requirements will be recorded in the following:

- a. Project Requirements Management System (eg DOORS);
- b. Hazard Log;
- c. Safety Case.

8.2.2 Within the Project Requirements Management System, it may be desirable to annotate Safety Requirements as “Safety”, so that they can be readily recognised and traced.

8.2.3 The Hazard Log is likely to contain some of the Safety Requirements relating to particular mitigation actions. However, it is unlikely to contain all the Safety Requirements.

8.2.4 The Safety Case must contain all the Safety Requirements, together with the justification of how they were derived. The Safety Case will eventually include Claims that each of the requirements has been satisfied, together with the Argument and Evidence to justify the Claim.

**9 RECOMMENDED TOOLS AND FORMS**

9.1.1 Safety Requirements should be included within the Project’s Requirements Management System and can be annotated as “Safety”, so that they can be readily recognised and traced. DOORS is DE&S’s preferred tool for Requirements Management.

9.1.2 **Guidance Sheet SMP10/G/01** - Safety Topics for ITT Questionnaires, contains a list of topics which should be tailored to specific project characteristics and used in preparing a Safety Management questionnaire as part of an ITT.

**10 GUIDANCE**

**10.1 Alignment with Environment**

10.1.1 The key alignment opportunity in SMP10 is to ensure wherever possible that Safety and Environmental Requirements are consistent and compatible, and where possible can be achieved by the same action.

10.1.2 It is important, both for Safety and Environmental Management that the location and amount of hazardous and restricted materials in the equipment is known and recorded. Suppliers and service providers should be required to declare this inventory information, with due regard to possible future legislation, and that it should be recorded in the Safety Case.

**10.2 Categories of Safety Requirements**

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- 10.2.1 The requirements for safety will vary significantly with the type of project. Some of the different types of safety requirements that may need to be considered are:
- a. **Legal requirements.** Such as the HSWA and its accompanying legislation, the Merchant Shipping Act 1995, Civil Aviation Act 1982 as amended 2006 or the Road Traffic Act 1991;
  - b. **MOD Certification.** Historically the MOD has developed a large number of certification requirements in order to manage hazardous aspects of defence equipment. Examples include; Military Aircraft Release, Ship Stability Certification and Laser Safety Clearance Certificate. The respective FSMO can provide advice on certification requirements and advise on MOD specialist safety authorities involved in certification requirements;
  - c. **Safety Objectives.** This includes the general requirements for safety management, eg producing a Safety Case (see Procedure SMP12 – Safety Case and Case Report). It also includes complying with the specialist MOD policy and procedures which are relevant to the particular project or equipment;
  - d. **Safety Targets.** See Section 10.4 below. Further guidance is contained in the domain-specific Safety JSPs and Def Stan 00-56.
- 10.2.2 It should be recognised that Legislation includes absolute, prescriptive and proscriptive requirements, as well as those requiring Risk to be made tolerable and ALARP. Thus the Safety Requirements for an equipment or service are likely to include absolute aspects as well as Risk-based aspects. The Safety Case must therefore do more than show that all identified Risks have been made ALARP.
- 10.3 Safety Requirements Depending on System Function**
- 10.3.1 Where a system has a safety-related function, it means that failure to achieve the function can result in harm. It is therefore important that the function is achieved with appropriate Reliability and performance. The critical first stage is to recognise functionality which is safety-related so that appropriate Safety Requirements are derived.
- 10.3.2 Reliability targets shall be assigned to safety systems or functions. The targets should be established on the basis of the safety criteria and be consistent with the roles of the systems or functions in different accident sequences.
- 10.3.3 Some systems have a defensive role whereby inaction under hostile circumstances may constitute a hazard. Safety targets for such systems shall address the requirements to reduce to a tolerable level, the risk resulting from inaction under hostile circumstances. Where there is a conflict between the practical realisation of safety targets for action and inaction within the system’s operational role, a reasonable balance of risk reduction shall be established and agreed by the IPT Leader after consulting the Safety Panel.
- 10.3.4 Safety-related functionality can result from the Capability requirement or from the

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context in which it operates. It is therefore important that the system requirements and the boundary interfaces are examined in a systematic and exploratory way to identify and explore the effects of potential functional failures. The safety-related functionality can result from any parent systems and the use they make of outputs from the system of interest.

**10.4 Qualitative and Quantitative Safety Targets**

10.4.1 A target should describe the level of risk that is tolerable in terms of severity and probability of harm. They should address specific technical requirements, legislation to be met and require that all residual risks are reduced to a level that is tolerable and ALARP. The target may be either qualitative or quantitative, but both types need to be tailored to the individual project.

10.4.2 A quantitative target may be expressed in several ways, such as:

- a. the probability of death per operating hour,
- b. the probability of death per year,
- c. the probability of death over the expected lifetime of the equipment;
- d. the probability of loss of the platform or system.

10.4.3 The way of expressing the target will vary according to the nature of the equipment, eg JSP553 cites aircraft safety targets in terms of probability of death/aircraft hull loss per operating hour.

10.4.4 It must be remembered that although quantitative, demonstration that these targets have been achieved or bettered is not generally practicable, either over the lifetime of a project or during a relatively short design and development process. They are to be used to indicate the level of performance/integrity expected from the equipment, and as a baseline against which to argue the Safety Case.

10.4.5 In addition to the probability of death, there are other targets which should be considered, such as the probability of a major or minor injury, the loss of platform/system and the effect on the environment. When there is more information available, usually after the Preliminary Hazard Analysis (see Procedure SMP04 – Preliminary Hazard Analysis), then projects should be more able to develop targets for particular hazardous events. This process is known as “goal setting” and follows the safety best-practice of several other industry sectors in the UK.

10.4.6 The system safety targets should be generated at the Concept stage and included within the safety requirements section of the URD. During Assessment and Demonstration further analyses will be undertaken with the aim of refining the safety targets for inclusion in the SRD.

10.4.7 The system safety targets should be included within the MOD’s invitation to tender. The prospective contractors should develop the target further and flow the target down through the design into individual sub-system safety allocations.

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10.4.8 It should be remembered that only MOD can set the levels of Risk which they will be prepared to tolerate for the military Capability which a system brings them. This requires the involvement of many MOD stakeholders, but cannot be done on their behalf by Contractors working in isolation.

**10.5 Individual and Societal Risk Criteria**

10.5.1 HSE has published criteria which define the limits of Tolerability for Safety Risks to Individuals (eg workers and general public) and also for Safety Risks which might affect many people simultaneously (eg a major accident at an industrial facility). These generic criteria can help IPTs to define the limits of Tolerability for their systems.

10.5.2 It must be remembered that the HSE's published figures for individual risk apply for the whole working year and individual Projects can only be permitted to take a proportion of the total Risk budget because their system will not be the only source of Risk throughout a working year. Guidance should be sought from FSMOs on the apportionment of Risk to individual systems.

10.5.3 It must also be remembered that these criteria are relevant to all the potential sources of Risk of fatality taken together. Thus it would be wrong to use these criteria as a comparator for the different possible fatal accidents on an individual (accident by accident) basis.

10.5.4 If the criteria for Societal Risk are applicable to a system, it should be remembered that the Individual risk Criteria are still relevant and both must be satisfied for the system to be considered to be Tolerably Safe.

**10.6 Apportionment of Safety Requirements**

10.6.1 Whilst MOD must set the overall Safety Requirements for a system, it is appropriate to allow Contractors to decide how these Requirements are to be achieved. For example, this can involve the apportionment of Requirements to lower-level sub-systems or functions.

**10.7 Responsibility for Safety and Managing Risk**

10.7.1 IPT Leaders and contractors negotiating contracts for safety tasks, are reminded that, within the scope of MOD Policy, corporate responsibility for safety remains with the MOD, but responsibility for Managing Risk can be shared according to who is best-placed/competent to manage it. Contractual documents must clearly state the division of work so that all parties understand the requirements to manage those aspects of safety placed on them.

10.7.2 The IPT Leader should ensure that the contractor produces an adequate SMS for the contracted work. Interfaces, lines of responsibility and accountability between the IPT Leader and their contractors should interface effectively and be described in the Project's and contractor's SMSs. IPT Leaders are to ensure that their contractors are

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competent, with appropriate knowledge and experience of civil and MOD safety requirements. Advice on the competence of contractors and managing the safety interfaces can be sought from the FSMOs.

**10.8 Manufacturers’ and Others’ Duties as Regards Articles for Use at Work**

10.8.1 Section 6 of HSWA places specific duties on those who can ensure that articles and substances are safe and without risks to health as it is reasonably practicable to make them before they are used and that articles are properly erected and installed. The following extract from Section 6 states; It shall be the duty of any person who designs, manufactures, imports or supplies any article for use at work:

- a. to ensure, so far as reasonably practicable, that the article is so designed and constructed so as to be safe and without risks to health at all times when it is being set, used, cleaned or maintained by a person at work;
- b. to carry out or arrange for the carrying out of such testing and examination as may be necessary for the performance of the duty imposed on him by the preceding paragraph;
- c. to take such steps as are necessary to secure that persons supplied by that person with the article are provided with adequate information about the use for which the article is designed or has been tested and about any conditions necessary to ensure that it will be safe and without risks to health at all such as are mentioned in paragraph a) above and when it is being dismantled or disposed of; and
- d. to take such steps as are necessary to secure, so far as is reasonably practicable, that persons so supplied are provided with all such revisions of information provided to them by virtue of the preceding paragraph as are necessary by reason of its becoming known that anything gives rise to a serious risk to health or safety.

10.8.2 Designers, manufacturers, suppliers, importers and installers are required to make articles and substances without risks to health and safety which are reasonably foreseeable. Operator error or inattention, for example, is reasonably foreseeable and should be taken into account when seeking to ensure safety. The use of articles and substances for wholly inappropriate purposes is not reasonably foreseeable and does not need to be taken into account.

**10.9 Contractual Arrangements for Sub-contractors**

10.9.1 The contractor is responsible to the IPTL for his sub-contractor’s work. The contractor should make such arrangements with his sub-contractors, and they with theirs, as will ensure that the sub-contracted materiel is satisfactory.

**10.10 Prescriptive and Performance-based Standards**

10.10.1 Changes brought about by the SMART Acquisition philosophy supports the MOD’s move away from “tell me how to do it” (prescriptive standards) towards “tell me what to achieve and leave me to decide how I do it” (performance based standards). However, prescription can still be useful in certain contexts. For example, this could

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include situations where systems are of well understood technology and functionality and there is established good practice for controlling the Safety Risks.

10.10.2 Performance based standards align well with the goal setting principles of the Policy. However, prescriptive/deterministic rules can still form effective parts of a SMS for specific risks, as they:-

- a. are often widely used and understood;
- b. do not require advanced knowledge or deep competence to apply, making them easier to contract against;
- c. enable low-tech designs to be quickly and repeatedly generated in a reliable/predictable format;
- d. capture expertise/historic lessons learnt into a readily useable format or formulae, permitting benchmarking;
- e. support established feedback and review systems from in-service experience, permitting easier survey, verification and acceptance into service;
- f. provide a more clear-cut route to achieving a safety Requirement, which is less susceptible to corruption by programme or resource considerations.

10.10.3 However, prescriptive/deterministic standards have disadvantages over performance based standards since:-

- a. the application is based on past practice, often making them inappropriate for new technology, unusual circumstances and stifles innovative approaches or solutions;
- b. the original purpose of the standard can be hidden or may no longer apply, the reasons for specific criteria are not expressed;
- c. compliance with the standard discourages further work to seek safety improvements;
- d. often do not account for human error or violation of procedures.

**10.11 Hierarchy of Standards**

10.11.1 To comply with Secretary of State’s policy, the MOD needs to ensure that the management and technical standards that are adopted are consistent with best civil and international standards. To achieve maximum harmonization it is therefore MOD policy to utilise international standards where appropriate and an agreed hierarchy is as follows:

- a. European Union civil standards.
- b. International civil standards.
- c. UK civil standards.

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d. Standardised NATO Agreements (STANAGs).

e. UK Defence Standards.

**10.12 Defence Standards for Safety**

10.12.1 It is recommended that appropriate standards are used, for example:

a. Defence Standard 00-56 Issue 4 Safety Management Requirements For Defence Systems;

b. Standards applicable to the system environment, for example, Def Stan 00-970 Design & Airworthiness Requirements for Service Aircraft, Def Stan 05-123 Technical Procedures for the Procurement of Aircraft Weapons & Electrical Systems etc

**10.13 Software Safety Requirements**

10.13.1 For programmable systems, it is normal to derive a Software Requirements Specification (although other titles may be used). This should define the functions that the software must perform which, taken together with the capabilities of the hardware components, will allow the overall system to meet its requirements.

10.13.2 In just the same way as safety requirements are set at the system level and form part of the overall system requirements, it is usual to establish a Software Safety Requirements Specification, either as a subset of the Software Requirements Specification or as a separate document.

10.13.3 The software safety requirements will normally include requirements for features which can tolerate faults as well as requirements for dependability of the software. PrEN 50128 provides guidance on fault-tolerant features. Dependability should be treated by specifying the SIL of the software.

10.13.4 Evidence of validation of the software against its requirements should be produced. This is usually documented in a software Safety Case Report or a software assessment report and a software validation report. This evidence will form an important part of the overall system Safety Case.

**10.14 Justification and Validation of Safety Requirements**

10.14.1 When defining Requirements, a top-level Safety Assessment is useful for categorising Requirements and justifying their selection as follows:-

a. Requirements for full compliance with relevant legislation;

b. Requirements to provide evidence that MOD has safety levels at least as good as statute where legislation does not apply;

c. Requirements proving from first principles that target levels demonstrably reduce risks to ALARP levels.

10.14.2 When an action or decision is challenged, the Safety Case is likely to be scrutinised by military Boards of Inquiry (BOI) and civil courts of law. IPT Leaders should therefore ensure that safety Requirements for their projects are clearly recorded for

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external readership or for auditors together with clear justifications that they are suitable and sufficient.

10.14.3 Each Safety Case should include a collation of Safety Requirements with associated safety justifications, structured using high-level qualitative Safety Assessment. These safety justifications should be constructed using a combination of evidence that each system's Safety Requirements have been set at levels specified by:-

- a. Compliance with deterministic standards, demonstrated as good or best-practice, for a risk in a mature or well understood domain or;
- b. Achievement of qualitative Requirements, (high-level principles, work practices etc.) for more novel risks, or for systematic failure mechanisms;
- c. Numerical targets often supported by quantitative Safety Assessment for random events, which can benchmarked against historic data and to target levels where that is considered best practice.

**10.15 Demonstration that Requirements have been Satisfied**

10.15.1 Provision must be made for the Validation of the Safety Requirements made in the design and build phase during the lifetime of the system or equipment.

10.15.2 After the safety requirements apportioned to system elements and components are verified to be met, it is necessary to conduct an assessment to verify that the total system meets its overall Safety requirements.

**10.16 Inability to Satisfy the Safety Requirements**

10.16.1 When it is determined that safety requirements cannot be met by a system element, there are three options:

- a. it may be decided to accept the risk, in which case the appropriate management level as defined in SMP09 – Risk Acceptance should endorse the decision,
- b. changes may be made to the design or
- c. the apportionment of the safety requirements may be changed to alter the balance of safety significance between the elements. For example, when procedures are used to overcome limitations in equipment, the safety dependency on the equipment is reduced, and so its safety requirements can be revised.

**10.17 Domain-Specific Guidance and References**

10.17.1 Additional guidance on Safety Requirements and Contracting is contained in the following references:

- a. Land Systems: JSP 454 Issue 4:
  - i. Safety Requirements Part 1 Section 4
- b. Ship Safety Management: (JSP 430 Issue 3):
  - i. Design Safety Requirements (Section 6.2);

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- ii. Contractor Interfaces (Section 7.2);
  - c. Airworthiness: (JSP 553 1<sup>st</sup> Edition):
    - i. Safety Criteria (1.37 et seq.);
    - ii. Responsibility for Design and Development (Annex N);
    - iii. It should be noted that for air systems, contractors should be Design Approved Organisations (Def Stan 05-123 refers).
  - d. Ordnance, Munitions & Explosives (OME): (JSP 520 Issue 2.0):
    - i. Safety Standards (0109-0112);
    - ii. Safety Requirements (0408-0410).
    - iii. 0409 “Generic OME safety user requirements are generated, reviewed and maintained by DOSG. For each new OME capability, the appropriate generic requirements shall be developed into project specific safety requirements. The output from this process should be a set of OME safety user requirements, written in safety criteria terms.”
  - e. Nuclear Propulsion (JSP 518 Issue 1.2):
    - i. Principle 24 – Reliability Targets (A63).
- 10.18 Guidance for Different Acquisition Strategies**
- 10.18.1 The IPT Leader is required to positively assure that safety has been adequately addressed, on the MOD’s behalf, wherever Design Authority resides with industry (COTS), according to the legal principles of civil liability, the sale and purchase of goods.
- 10.19 Warnings and Potential Project Risks**
- 10.19.1 It is most important that Safety Requirements are established at the earliest stages of the Project life cycle, since they have a fundamental role in shaping the subsequent project. Failure to do so can have far reaching effects on both cost and programme.
- 10.19.2 If Contractors with inadequate competence in Safety Management are chosen, then there are likely to be significant impacts on Project Time and Cost as they struggle to understand and apply the necessary Requirements and Standards. There can also be an impact on the achieved levels of Safety performance as they fail to apply the “Safety-led engineering” philosophy in a timely manner.

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**Guidance Sheet SMP10/G/01 Safety Topics for ITT Questionnaires**

NB: The following list of topics should be tailored to meet the requirements of individual projects.

**a. Organisation and Personnel**

- Who within the company would have overall responsibility for safety on the project?
- Would a project safety officer be appointed?
- What would be the lines of communication for safety issues?
- Who would be responsible for carrying out the individual safety tasks?
- Will the company hold any safety panel meetings?
- Would subcontractors to be used for safety related work?
- What criteria would be used for selecting subcontractors?
- What qualifications and experience do the key safety personnel have (provision of senior safety personnel CVs may be requested)?

**b. Company Safety Policy and Track Record**

- Provide details of the company's track record in Health and Safety and Equipment Safety Assurance;
- What is the company's safety policy?
- Have there been any enforcement actions against the company?

**c. Safety Management System**

- Describe the safety management system for the project;
- Describe how the system will be audited.

**d. Safety Assessment**

- Define the scope of the safety assessment;
- Describe the tools and techniques to be used.

**e. Safety Case**

- Define the scope of the safety case.

**f. Safety Targets.**

- Detail specific safety targets for the project;
- Detail the evidence that will be provided to MOD to demonstrate that these targets have been met.

**g. Safety Standards and Certification**

- List any standards with which the project should comply;
- Detail the evidence that will be provided to the MOD to demonstrate that the standards have been met.

**h. Independent Safety Auditor**

- Define the terms of reference for the ISA including scope of work and lines of communication;

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<ul style="list-style-type: none"> <li>• Propose an ISA and demonstrate their independence from the prime contractor;</li> <li>• Detail the qualifications and previous experience of the ISA.</li> </ul>	
<b>i. Safety Work Schedule</b> <ul style="list-style-type: none"> <li>• Provide a programme of work that illustrates how the safety tasks will be carried out;</li> <li>• Are all safety deliverables to be linked into project milestones ?</li> </ul>	

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<b>0</b>	<b>SHOWING CONFORMANCE</b>
<b>0.1</b>	<b>Options</b>
0.1.1	There are four options to demonstrate conformance when applying this system procedure: <ul style="list-style-type: none"> <li>a. Follow the defined system procedure using the recommended guidance and tools, including allowed variations and options.</li> <li>b. Use an equivalent process and tool set generated elsewhere and document evidence of procedural equivalence.</li> <li>c. Use a bespoke process and tool set for the project and document how the bespoke procedure achieves the objectives defined for this system procedure.</li> <li>d. Where the procedure is considered to be not relevant, document the basis for this decision.</li> </ul>
<b>1</b>	<b>INTRODUCTION</b>
1.1.1	A <b>Hazard Log</b> is defined in Def Stan 00-56 Issue 4 as: <p>“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.”</p>
1.1.2	These Hazards, accident sequences and accidents are those which could conceivably happen, and not only the ones which have already been experienced.
1.1.3	The term Hazard Log is somewhat misleading, because the information stored relates to the entire Safety Programme and covers Accidents, Controls, Risk Evaluation and ALARP justification, as well as data on Hazards.
<b>1.2</b>	<b>Purpose</b>
1.2.1	A Hazard Log is used and maintained as the principal means of establishing progress on resolving risks associated with identified Hazards. It provides traceability of the Hazard management process to show how Safety issues are being dealt with and resolved.
1.2.2	Outstanding issues in the Hazard Log should be regularly reviewed by the Project Safety Committee to make sure that actions are completed and unacceptable Risks are resolved.

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<b>2</b>	<b>PROCEDURE OBJECTIVES</b>
2.1.1	<p>The Hazard Log contains the traceable record of the Hazard Management process for the Project and therefore:</p> <ul style="list-style-type: none"> <li>a. Ensures that the Project Safety Programme uses a consistent set of Safety information;</li> <li>b. Facilitates oversight by the PSC and other stakeholders of the current status of the Safety activities;</li> <li>c. Supports the effective management of possible Hazards and Accidents so that the associated Risks are brought to and maintained at a tolerable level;</li> <li>d. Provides traceability of Safety decisions made.</li> </ul>
<b>3</b>	<b>RESPONSIBILITIES</b>
<b>3.1</b>	<b>Accountability</b>
3.1.1	The IPTL is accountable for the completion of this procedure.
<b>3.2</b>	<b>Procedure Management</b>
3.2.1	The IPTL may delegate the management of this procedure to a member (Safety Manager) or members of the IPT.
3.2.2	It is the responsibility of the IPT to define the scope and format of the Hazard Log and to ensure that the information it contains is current and reviewed at appropriate intervals.
<b>3.3</b>	<b>Procedure Completion</b>
3.3.1	The Hazard Log ensures that a common set of information can be shared by all parties with a genuine need for access. A single Hazard Log should therefore be maintained that is accessible by all these parties.
3.3.2	The Hazard Log may be run by the Prime Contractor or the MOD Project Team or a third party such as a Safety Assessment contractor. Indeed the Hazard Log may pass from one authority to another at key stages in the programme. For example, the Prime Contractor is likely to have greatest need of the Hazard Log during System Development, but the MOD Project Team may be a more appropriate controller when the System is in service.
3.3.3	The Hazard Log should be under the control of a Hazard Log Administrator, who is responsible to the Prime Contractor's Project Safety Engineer or the MOD's Safety Manager. The Hazard Log Administrator should have full access to the Hazard Log allowing him to add, edit or close Hazards. All other personnel requiring access to the Hazard Log are allowed read only access. This allows for visibility of Hazards to all but the strict control and administration of Hazards is limited to the Hazard Log Administrator.

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<b>4</b>	<b>WHEN</b>	
<b>4.1</b>	<b>Initial Production</b>	
4.1.1		The Hazard Log should be established at the earliest stage of the programme and be maintained thereafter as a 'live' document or database to reflect the current design standard.
<b>4.2</b>	<b>Review, Development and Acceptance</b>	
4.2.1		A review of the Hazard Log is essential at regular intervals to ensure that Hazards are being successfully managed and that the robustness of the safety arguments in the Safety Case can be established.
<b>5</b>	<b>REQUIRED INPUTS</b>	
<b>5.1</b>	<b>General</b>	
5.1.1		This procedure for Hazard Log requires inputs from: <ul style="list-style-type: none"> <li>a. Outputs from Procedure SMP01 – Safety Initiation;</li> <li>b. Outputs from Procedure SMP04 – Preliminary Hazard Identification and Analysis;</li> <li>c. Outputs from Procedure SMP05 –Hazard Identification and Analysis;</li> <li>d. Outputs from Procedure SMP06 –Risk Estimation;</li> <li>e. Outputs from Procedure SMP07 –Risk and ALARP Evaluation;</li> <li>f. Outputs from Procedure SMP08 –Risk Reduction;</li> <li>g. Outputs from Procedure SMP09 –Risk Acceptance;</li> <li>h. Outputs from Procedure SMP10 –Safety Requirements and Contracts.</li> </ul>
5.1.2		The Hazard Log is a database which references all the major items of Safety documentation relating to a project. This can include the following: <ul style="list-style-type: none"> <li>a. Safety Criteria Report;</li> <li>b. Safety Requirements;</li> <li>c. Hazard Identification Reports;</li> <li>d. Hazard Analysis Reports;</li> <li>e. Risk Analysis and Assessment Reports;</li> <li>f. Safety Audit and Inspection Reports;</li> <li>g. Safety Case Reports.</li> </ul>
5.1.3		The Hazard Log stores information on hazards, accidents and accident sequences which might be associated with the system. Thus it records the results of all the Risk Management procedures (SMP04 to SMP09).

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<b>5.2</b>	<b>Supporting Documentation</b>	<p>5.2.1 Where the Hazard Log has adequate capacity and resources permit, the following supporting documentation should also be either directly embedded or cross-referenced by hypertext link where the Log is an electronic format:</p> <ol style="list-style-type: none"> <li>a. Material/system survey reports;</li> <li>b. Design defect reports, concessions and production permits;</li> <li>c. System/equipment breakdown and failure reports;</li> <li>d. Reports of technical design/material state reviews;</li> <li>e. Reports of quality, reliability and safety audits;</li> <li>f. Accident and incident reports, during construction, maintenance or in-service operation.</li> </ol>
<b>6</b>	<b>REQUIRED OUTPUTS</b>	
<b>6.1</b>	<b>Hazard Log Report</b>	
6.1.1		The Hazard Log is a continuously evolving record (database or document) which should stay with the System throughout its life cycle. A Hazard Log Report is a snapshot of the Hazard Log status on a given date.
6.1.2		Hazard Log Reports will be produced for the purpose of review (eg by the PSC or the ISA) or communication of the current status of the Safety Programme. Where a computer tool is used to implement the Hazard Log, it must be capable of producing a range of reports, from detailed to summary.
6.1.3		Hazard Log Reports must be capable of showing the linkages between Hazards, Accidents and Controls (ie which Hazards could lead to which potential Accidents, possibly with many-to-many relationships, and which Controls relate to which Hazards and Accidents). They must also differentiate between Controls which are already in place and those which are being considered or planned.
<b>7</b>	<b>DESCRIPTION</b>	
<b>7.1</b>	<b>Hazard Log Fundamentals</b>	
7.1.1		The Key features associated with the Hazard Log are identified below:
a.		The Hazard Log is a live document and as such should be updated throughout the programme. The Hazard Log should be set up at the initial stages of a project and remains current throughout the CADMID life cycle of a system.
b.		The Hazard Log provides a record of all safety assessment information and evidence associated with a programme.
c.		The Hazard Log provides documentation of all Safety Risk Evaluations conducted on a programme.
d.		The Hazard Log provides an auditable tracking mechanism for a programme,

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showing what decisions were taken, when and why.

e. The Hazard Log provides a cross reference to all other Safety Analysis and documentation for a programme.

**7.2 Content of Hazard Logs**

7.2.1 Typical Hazard Log contents are described in **Guidance Sheet SMP11/G/01 - Hazard Log Contents**.

7.2.2 The Hazard Log should describe the system to which it relates, and record its scope of use, together with the safety requirements.

7.2.3 When Hazards are identified, the Hazard Log will show how these Hazards were evaluated and the resulting residual risk assessed, and will either recommend further action to mitigate the Hazards, or formally document the acceptance of these Hazards and the ALARP justification.

7.2.4 The Hazard Log is a structured way of storing and referencing safety Risk Evaluations and other information relating to an equipment or system, it is to be co-ordinated and controlled whilst maintaining an auditable record of that information. It is the principal means of tracking the status of all identified Hazards, decisions made and actions undertaken to reduce the risk and should be used to facilitate oversight by the PSC and other stakeholders.

7.2.5 The Hazard Log is a tracking system for Hazards, their closures, and residual risk and must be maintained throughout the system life cycle as a “live” document. As changes are integrated into the system, this Hazard Log is updated to incorporate added or changed Hazards and the associated residual risk to reflect the current design standard.

7.2.6 The Log should capture the inputs to and outputs from Hazard Analysis and Risk Evaluation sessions. ALARP justification arguments and conclusions should be recorded when mitigation actions are complete.

**7.3 Designing the Hazard Log**

7.3.1 The process for a Hazard Log requires a number of initial steps to be undertaken prior to Hazard Log population. This is to ensure that there is a suitable infrastructure in place before Hazard information is stored.

a. A method by which the Hazard Log is to be implemented must be selected; this can either be in paper or electronic form. It is important at the outset to identify the appropriate tool/administration method for the Hazard Log.

b. A Hazard Log administrator must be appointed. The Hazard Log administrator will be responsible for the maintenance, upkeep and configuration control of the Hazard Log. All non administrators should be allowed read only access if the Hazard Log is in electronic format.

c. The Hazard Log must be ‘set up’. This will include activities such as inclusion

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of the Risk Classification scheme that has been agreed, determination of appropriate Hazard categories, status definitions and general set up activities to ensure that the Hazard Log will operate as required. The latter may be in the form of a guidance note for a paper based system or checking of the robustness of an electronic system.

#### **7.4 Starting the Hazard Log**

7.4.1 Once the system and its boundaries have been defined and the Hazard Identification process has begun, the Hazard Log should be established in order to keep a record of the Hazards and proposed or implemented mitigation measures to ensure that the Hazards are being appropriately controlled.

#### **7.5 Running and Using the Hazard Log**

7.5.1 The Hazard Log is the configuration control mechanism for the Safety Assessment process, and Hazards should not be deleted from the Hazard Log, but closed and marked if no longer relevant. A procedure is to be defined for the management and control of the Hazard Log. The Hazard Log is to be retained for the entire system life cycle and it should act as the primary source of the Logical arguments, or Safety Case, for the deployment of the system into service.

7.5.2 Review of the Hazard Log is essential at regular intervals to ensure that Hazards are being successfully managed and that the robustness of the established safety arguments in the Safety Case are not being compromised.

7.5.3 Generally the Hazard Log update might occur whenever:

- a. A relevant Hazard or potential accident is identified, either through formal analysis or as a result of a change to the design/procedure/operating environment.
- b. A relevant incident occurs, perhaps during testing or demonstration.
- c. Further information relating to existing Hazards, incidents or accidents comes to attention; or safety documentation is created or re-issued.

7.5.4 In order to provide project awareness of Hazard and Accident data, the Hazard Log should be accessible to all of the appropriate project staff. This should include, but not necessarily be limited to the Project Safety Panel.

7.5.5 The Hazard Log should be available for inspection by the Safety Auditor, the Safety Assessor and representatives of any relevant Safety Authorities.

#### **7.6 Hazard Log Process**

7.6.1 Since the Hazard Log is a repository for managing identified Hazards, it is possible for Hazard identification to begin prior to the implementation of the Hazard Log.

7.6.2 Once the initial steps have been undertaken, the process of information entry can be started. The generic flow of the process is shown in the following steps:

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- a. Hazard Identification – Initially taken from procedures such as Preliminary Hazard Analysis, and then augmented by subsequent Risk Management activities.
  - b. Accident sequence development associated with the identified Hazards.
  - c. Formal Risk Evaluation of each accident sequence.
  - d. Mitigation identification – The recording of the appropriate and agreed mitigation for each accident.
  - e. Mitigation/control owners established – This should ensure that the mitigation or controls identified are put in place and the Hazard is addressed.
  - f. Cross checking to see if there are any other, previously identified Hazards or accident sequences linked with this Hazard.
  - g. Resolution – Status changes completed as required, formal closures recorded, including reference to evidence and ALARP justification recorded.
  - h. Ongoing Hazards managed and new Hazards added as required.
  - i. Production of a Hazard Log Report as determined by the Project Safety Plan.
- 7.7 “Ownership” of Hazards and Controls**
- 7.7.1 Where the Project Safety Programme identifies Hazards that are the responsibility of another Project, then the information must be passed to the person with delegated Authority for that area. The Project Hazard Log must record that this was done.
- 7.7.2 Because Hazards and Accidents usually have a range of Control measures of different types associated with them, there is no single Hazard “owner” who is responsible for mitigating the associated Risks, other than the overall Delegated Authority. When a Control measure is agreed for implementation, it should be clearly assigned to an “owner”. This might be the Prime Contractor for a design change, the Training Authority for a topic to be covered in Maintainer training, or the User for a procedural control solution.
- 7.8 Closure or Removal of Entries**
- 7.8.1 It is considered best practice for the Hazard Log to record each Hazard as “open” and for ALARP arguments to be provisional until all mitigation actions are confirmed to be satisfactorily completed. An example is where the mitigation depends upon production of an operational procedure that may not be written for a considerable time after the Hazard is first identified at an early stage of design or construction.
- 7.8.2 Hazards should not be deleted from the Hazard Log, but closed and marked as “out of scope” or “not considered credible”, together with the justification. Where they are no longer considered relevant to the system, the Log entry should be updated to reflect this.

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<b>7.9</b>	<b>Archiving on Project Closure</b>
7.9.1	At the end of the project, the Hazard Log should remain as a historical record, which may be useful to refer to for similar applications in the future.
<b>8</b>	<b>RECORDS AND PROJECT DOCUMENTATION</b>
8.1.1	Where relevant, the outputs from this procedure should feed into the following: <ul style="list-style-type: none"> <li>a. SRD (System Requirements Document) – for any specific Safety requirements;</li> <li>b. CSA (Customer Supplier Agreement) – to document agreements on Safety information to be delivered by the IPT;</li> <li>c. TLMP (Through Life Management Plan);</li> <li>d. Safety elements of Initial Gate and Main Gate submissions.</li> </ul>
<b>8.2</b>	<b>Data Security</b>
8.2.1	Adequate provision must be made for security and backup of the Hazard Log and other safety records.
8.2.2	The Hazard Log is a prime source of corporate knowledge and is the configuration control mechanism for the Safety Assessment process. As such it could be referred to in legal proceedings. Every effort should therefore be made by the IPT Leader to ensure that records are accurate, attributable, up to date and complete. Clear cross-referencing to supporting documents is essential.
<b>9</b>	<b>RECOMMENDED TOOLS AND FORMS</b>
<b>9.1</b>	<b>Hazard Log Software</b>
9.1.1	The DE&S's preferred corporate Hazard Log tool is the CASSANDRA database system. IPT Leaders should consider tailoring this system to meet their needs. Individual Projects or Peer Groups may develop any database or Hazard management program for their use, tailored to suit that individual projects needs, provided that the solution satisfies the objectives of this Procedure.
9.1.2	Whatever Hazard Log tool is adopted must be under strict configuration control to ensure robust audit trail.
9.1.3	CASSANDRA is a Hazard Management System designed to meet the requirements of Def Stan 00-56 Issue 4 and most other recognised safety management and assessment processes. In addition to recording information about Hazards and accidents, risk classification and control measures, required in the conventional Hazard Log, Cassandra also enables Hazards and accidents to be linked to show their relationships (one-to-many and many-to-many).

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**10 GUIDANCE**

**10.1 General Guidance**

10.1.1 Since a Hazard Log is a structured way of storing and referencing data and records on Hazards, documenting the Risk Evaluation and other information relating to an equipment or system, clear cross-referencing to supporting documents is essential. The supporting documentation can be either directly embedded or cross-referenced by the Hazard Log.

**10.2 Alignment with Environment**

10.2.1 The key alignment opportunity in SMP11 is to cross reference Environmental Features against Safety Hazards, so that common issues are identified and where possible assessed together, and to also to ensure that the potential environmental impact of a safety hazard, or a safety impact of an environmental hazard are not overlooked.

**10.3 Domain-Specific Guidance and References**

10.3.1 Additional guidance on the Hazard Log is contained in the following references:

- a. Land Systems: JSP 454 Issue 4:
  - i. Part 1 Section 3.3.6
  - ii. Part 1 Section 5.2.1
- b. Ship Safety Management: (JSP 430 Issue 3):
- c. Airworthiness: (JSP 553 1<sup>st</sup> Edition):
  - i. Chapter 4.33.7 (Contains reference to DEF.STAN 00-56)
- d. Ordnance, Munitions & Explosives (OME): (JSP 520 Issue 2.0):
  - i. Section III (0429)
- e. Nuclear Propulsion (JSP 518 Issue 1.2):
  - i. Nil

**10.4 Guidance for Different Acquisition Strategies**

10.4.1 The Hazard Log is required whatever acquisition strategy is adopted.

**10.5 Warnings and Potential Project Risks**

10.5.1 The relationship between Hazards, accidents and their management through setting and meeting Safety Requirements could be included within the Hazard Log. However, if it is not sufficiently robust or well-structured, this may overload the Hazard Log and obscure the identification and clearance of Hazards. The requirements of this clause are an important part in demonstrating the robustness of evidence of safety and should be clearly documented and referenced

10.5.2 If Hazards are not well defined when they are entered into the Hazard Log, then the rigour enforced by the need for a clear audit trail of changes made, may make it very

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difficult to maintain the Hazard and Accident records in the most useful structure. An appropriate structure should therefore be designed and agreed before data entry starts.

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**Guidance Sheet SMP11/G/01 Hazard Log Contents**

A suggested Hazard Log structure is as follows:

**a. Part 1 - Introduction**

This part should describe the purpose of the Hazard Log, and indicate the environment and safety criteria to which the system safety characteristics relate. The following details, appropriate to the programme phase, should be contained in this part:

- The purpose and structure of the Hazard Log. This should be of sufficient detail to ensure that all project staff understand the aim and purpose of the Hazard Log. The procedure for managing the Hazard Log should also be included.
- A description of the system and its scope of use. This should include reference to a unique system identifier.
- Reference to the system safety requirements.
- The accident severity categories, probability categories, equivalent numerical probabilities and accident risk classification scheme for the system.
- The design rules and techniques for each Safety Integrity Level.
- The apportionment of the random and systematic (Safety Integrity Level) elements of the hazard probability targets between all the functions of the system.

The description and scope of use of the system should be stated in order to indicate the environment to which the system safety characteristics relate. This information should be entered in Part 1 of the Hazard Log.

**b. Part 2 - Accident data**

This part should give sufficient information to identify the accident sequence linking each accident and the hazards which cause it. It should include the following:

- A unique reference.
- A brief description of the accident
- The accident severity category and probability targets appropriate to Risk Classes B and C.
- A cross reference to the full description and analysis of the accident sequence in the safety programme reports. This information should be used to justify the subsequent setting of the hazard probability targets.
- A list of the hazards and associated accident sequences that can cause the accident.

**c. Part 3 - Hazard data**

This part should give sufficient information to identify the risk reduction process applicable to a particular hazard. A summary of all the hazards and their status, including any outstanding corrective action, should be contained within this part to provide an overview of the current situation. This part should contain the following information for each hazard:

- A unique reference. A brief description of the hazard which should comprise the functions or components and their states that represent the hazard. Reference should also be made to the design documentation which describes the functions or components.
- The related accident severity category, and the random and systematic elements of the hazard

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probability targets appropriate to Risk Classes B and C.

- The predicted probability for the random element of the hazard.
- A statement as to whether or not the hazard requires further action to reduce the risk from the system to a tolerable level.
- A discussion of any possible means by which the risk could be reduced to a tolerable level, and notes on the re-evaluation of the accident sequence following such action.
- A brief description of the action to reduce risk, together with either a reference to the design documentation that has changed as a result of the action, or the justification for taking no action.
- A cross-reference to the full description and analysis of the hazard in the hazard analysis reports.

**d. Part 4 - Statement of Risk Classification.**

A Statement of Risk Classification should be included to provide a brief statement of the current System Risk Class. It should contain sufficient information to enable it to be a stand alone statement, and it should contain the Hazard Log reference to enable traceability to its supporting documentation.

**e. Part 5 – Journal**

A journal should be constructed to provide a historical record of the compilation of the Hazard Log. It should contain the following information:

- The date the Hazard Log was started.
- Entries made in the Hazard Log, including any accident or hazard reference numbers.
- Reference to the Safety Programme Plan.
- References to analysis and assessment reports.
- References to Safety Review and Project Safety Committee minutes.

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SMP12: Safety Case and Safety Case Report	1	1

<b>0</b>	<b>SHOWING CONFORMANCE</b>
<b>0.1</b>	<b>Options</b>
0.1.1	There are four options to demonstrate conformance when applying this system procedure: <ul style="list-style-type: none"> <li>a. Follow the defined system procedure using the recommended guidance and tools, including allowed variations and options.</li> <li>b. Use an equivalent process and tool set generated elsewhere and document evidence of procedural equivalence.</li> <li>c. Use a bespoke process and tool set for the project and document how the bespoke procedure achieves the objectives defined for this system procedure.</li> <li>d. Where the procedure is considered to be not relevant, document the basis for this decision.</li> </ul>

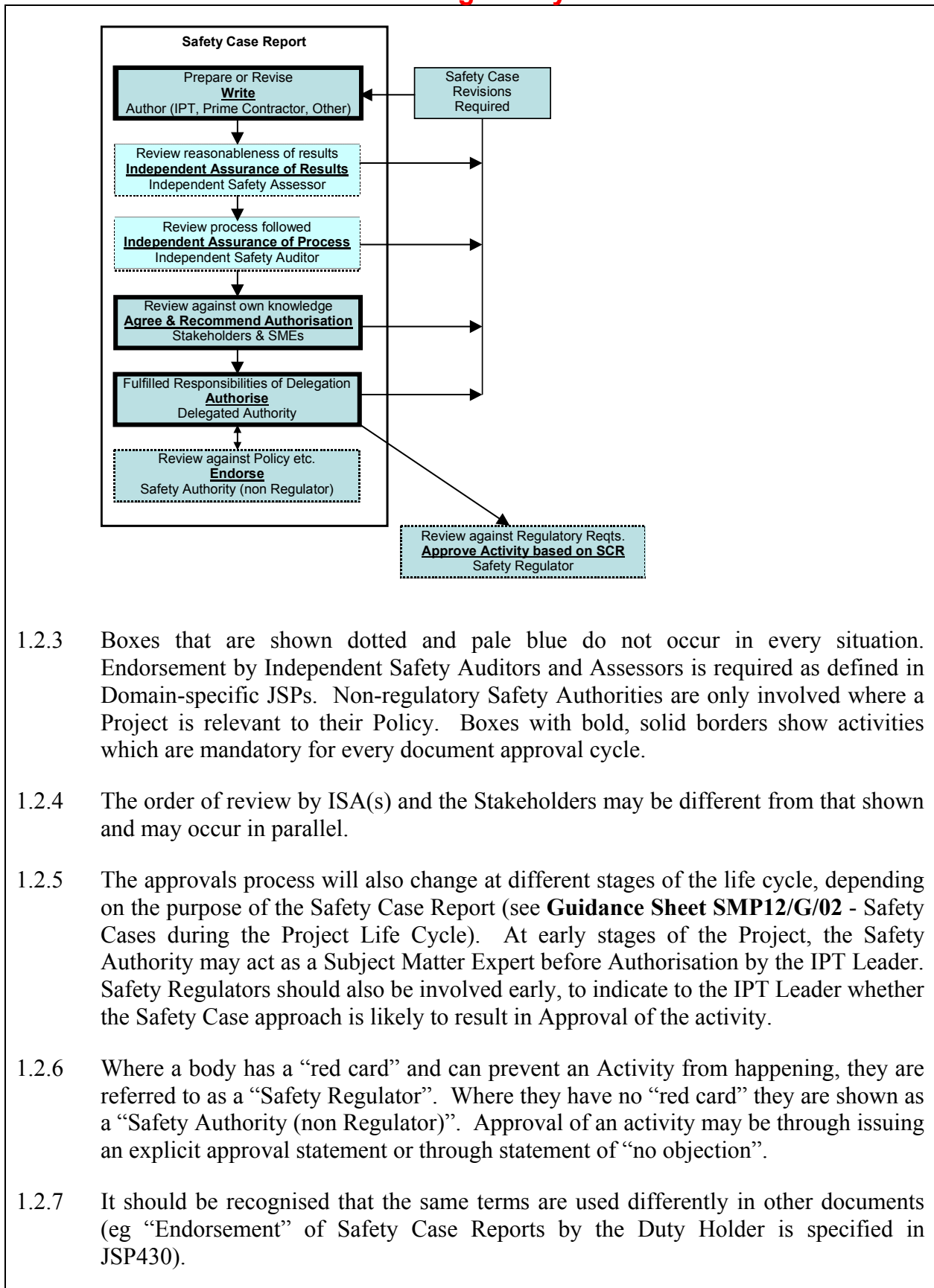
<b>1</b>	<b>INTRODUCTION</b>
1.1.1	<p>A <b>Safety Case</b> is defined in Def Stan 00-56 Issue 4 as:</p> <p>“A structured argument, supported by a body of evidence that provides a compelling, comprehensible and valid case that a system is safe for a given application in a given environment.”</p>
1.1.2	<p>A <b>Safety Case Report</b> is defined in Def Stan 00-56 Issue 4 as:</p> <p>“A report that summarises the arguments and evidence of the Safety Case, and documents progress against the Safety Programme.”</p>
1.1.3	<p>Within MOD, the Safety Case regime has been adopted not only as the means to demonstrate that the required, tolerable, levels of safety have been achieved, but also as the basis for the management of safety. It is also used to demonstrate compliance with legislative and regulatory requirements.</p>
1.1.4	<p>The generation of a Safety Case is an iterative process. It starts during the Concept stage of a project, with the setting of requirements, and develops through the Assessment, Development and Manufacturing stages to influence and validate the design and then finally qualifying the equipment and the SMS supporting it in service.</p>
1.1.5	<p>The Safety Case will bring together all the project Safety information generated by the Contractor(s) and the MOD, including the outputs of all Safety Assessment and Risk Management activities described in Procedures SMP01 to SMP09.</p>

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- 1.1.6 The Safety Case body of evidence can contain factual, historical, analytical, test and judgmental information. It may not all be stored together, but the Safety Case approach will ensure that important Safety information is recognised as such, and preserved in a traceable way.
- 1.1.7 The Safety Case provides the mechanism for Safety submissions to many MOD authorities providing Safety approvals (eg Safety Certificates) or acting as internal MOD Safety Regulators in specific areas (eg. Naval Authorities for Key Hazards). It is vital that IPTLs identify the approvals that will be required for their Project and plan how to provide the necessary information in a timely manner.
- 1.2 Safety Case Report Review and Sign-off**
- 1.2.1 When a Safety Case Report is generated, it must be reviewed and agreed by the relevant stakeholders. The following terminology is used in this Procedure to distinguish between the different types of review and “sign off” that will be applied to Safety Case Reports.
- Agree (a document)  
To agree that a document fairly represents the current situation, within the scope of knowledge of the signatory.
- Endorse (a document)  
To assert that a document meets the requirements of relevant policy, procedures and good practice.
- Authorise (a document)  
To assert that a document may be issued and that it reflects the individual’s acceptance of responsibility.
- Assurance  
Adequate confidence and evidence, through due process, that safety requirements have been met. [Def Stan 00-56 Issue 4]
- 1.2.2 To assist in understanding the relationship between the different terms, an example of a process for a document to be authorised is as shown overleaf:

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- 1.2.3 Boxes that are shown dotted and pale blue do not occur in every situation. Endorsement by Independent Safety Auditors and Assessors is required as defined in Domain-specific JSPs. Non-regulatory Safety Authorities are only involved where a Project is relevant to their Policy. Boxes with bold, solid borders show activities which are mandatory for every document approval cycle.
- 1.2.4 The order of review by ISA(s) and the Stakeholders may be different from that shown and may occur in parallel.
- 1.2.5 The approvals process will also change at different stages of the life cycle, depending on the purpose of the Safety Case Report (see **Guidance Sheet SMP12/G/02 - Safety Cases during the Project Life Cycle**). At early stages of the Project, the Safety Authority may act as a Subject Matter Expert before Authorisation by the IPT Leader. Safety Regulators should also be involved early, to indicate to the IPT Leader whether the Safety Case approach is likely to result in Approval of the activity.
- 1.2.6 Where a body has a “red card” and can prevent an Activity from happening, they are referred to as a “Safety Regulator”. Where they have no “red card” they are shown as a “Safety Authority (non Regulator)”. Approval of an activity may be through issuing an explicit approval statement or through statement of “no objection”.
- 1.2.7 It should be recognised that the same terms are used differently in other documents (eg “Endorsement” of Safety Case Reports by the Duty Holder is specified in JSP430).

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1.2.8 The Safety Case body of evidence cannot itself be approved, accepted, endorsed and authorised. However, the Safety Case Report, which provides a summary of this evidence at a particular time, should be subjected to this process.

**2 PROCEDURE OBJECTIVES**

- 2.1.1 The purpose of the Safety Case is:
- a. to document evidence that the Safety Requirements are being met, and that all identified risks are tolerable and ALARP;
  - b. to demonstrate that any activities underway at that time (including tests or trials) can be carried out safely;
  - c. to describe clearly the evidence and arguments used to justify the safety of the system that the processes and assessments made are appropriate and adequate, so that agreement can be reached on the validity of the claim of tolerable safety.
  - d. for systems requiring Safety approval outside the IPT (eg by a Safety Regulator, Safety Certification Authority or for integration into a higher-level system), the Safety Case contains the documentary evidence submitted for approval and will also include approval notifications or rejections.
- 2.1.2 The Safety Case Report is the means by which the IPT Leader demonstrates that all of the safety issues relating to a project have been brought to a condition appropriate for the stage in the life cycle. It therefore provides the Safety justification to support the major Project milestones as identified in Section 4.2 of this Procedure.

**3 RESPONSIBILITIES**

- 3.1 Accountability**
- 3.1.1 The IPTL is accountable for the completion of this procedure.
- 3.2 Procedure Management**
- 3.2.1 The IPTL may delegate the management of this procedure to a member (Safety Manager) or members of the IPT.
- 3.3 Procedure Completion**
- 3.3.1 The Project Safety Manager will be responsible for the completion of the procedure. However, in most cases, a large part of the detailed work will be carried out by contractors. In all cases Project Safety Committee members and other stakeholders should be involved in providing input and reviewing outputs.
- 3.3.2 Where different contractors are in competition with each other and have carried out separate Hazard Analyses, contractual and managerial arrangements should be made

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for the output from all to be made available to the successful contractor. This will reduce the likelihood of hazards being missed.

3.3.3 In large or complex projects, the Project Safety Manager must co-ordinate the Safety Case across the project to ensure that all relevant and credible hazards identified through Hazard Analysis by any party, including those outside the scope of a particular Contractor's control, are captured and managed through the Hazard Log.

**4 WHEN**

**4.1 Initiation of Safety Case**

4.1.1 The Safety Case body of evidence will start to be populated as soon as Safety Management activity is initiated for the Project.

**4.2 Production of Safety Case Reports**

4.2.1 A Safety Case Report should be produced at key milestones and as a periodic status report on the safety of the developing system. Their content and delivery points should be contractually agreed between the Contractor and the IPT Leader and be defined in the Project SMP. Typically for a major project, Safety Case Reports would be produced at the following times:

- a. Approval of the project Business Case at Initial Gate;
- b. Approval of the project Business Case at Main Gate;
- c. Clearance to begin Demonstration trials;
- d. Completion of the major aspects of design, (design baseline defined);
- e. Commitment to production;
- f. Clearance to begin testing/acceptance/User trials;
- g. Introduction to Service
- h. Significant changes to the design or material state (eg mid-life update);
- i. Significant changes in operational usage;
- j. Disposal.

4.2.2 The Safety Case Report may be produced by MOD, the Design or Support Contractor or by third parties, depending on the life cycle stage and other factors. Nevertheless, it will be subjected to a similar process of review and approval.

**4.3 Approval of Safety Case Reports**

4.3.1 When a Safety Case Report is issued to support a key project milestone, it should be reviewed by the Project Safety Committee including the ISA, if appointed, and agreed

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by them if they are satisfied that it fairly represents the current Safety status for the Project. Their observations and recommendations should be included as part of the Safety Case Report which will then be presented to the IPTL for authorisation.

**4.4 Acceptance and Endorsement of Safety Case by Regulators and Certification/Approval Authorities**

4.4.1 The Project SMP will identify the Safety approvals that will be required for the Project and show how the necessary information will be provided in a timely manner. Examples of those who may be involved in reviewing Safety submissions and providing Safety approvals (or similar), include:

- a. OME Safety Review Panel;
- b. Naval Authorities (for Ship Key Hazards);
- c. Military Laser Safety Committee;
- d. JATE;
- e. Authorities for Platforms or systems onto which the equipment will be fitted (including for Trials);
- f. Authorities for Facilities or sites where the equipment will be used, stored etc;
- g. Authorities responsible for Safe transportation.

4.4.2 It is important for the IPTL to recognise the difference between authorities providing Safety advice and those with the responsibility for operating Regulatory regimes. Whilst following appropriate advice and complying with a Regulatory regime are evidence of good practice, they do not transfer the responsibility for Safety from the IPTL to the advisor, Regulator or approving authority.

**4.5 Periodic Review of the Safety Case**

4.5.1 Since a Safety Case is a live set of documents that require update, configuration control and review to ensure that they address all safety considerations, these reviews should be specified in the Project SMP.

**5 REQUIRED INPUTS**

5.1.1 This procedure for the Safety Case and Safety Case Report requires inputs from:

- a. Outputs from Procedure SMP01 – Safety Initiation;
- b. Outputs from Procedure SMP02 – Safety Committee;
- c. Outputs from Procedure SMP03 – Safety Planning;
- d. Outputs from Procedure SMP04 – Preliminary Hazard Identification and Analysis;

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- e. Outputs from Procedure SMP05 –Hazard Identification and Analysis;
  - f. Outputs from Procedure SMP06 –Risk Estimation;
  - g. Outputs from Procedure SMP07 –Risk and ALARP Evaluation;
  - h. Outputs from Procedure SMP08 –Risk Reduction;
  - i. Outputs from Procedure SMP09 –Risk Acceptance;
  - j. Outputs from Procedure SMP10 –Safety Requirements and Contracts;
  - k. Outputs from Procedure SMP11 –Hazard Log.
- 5.1.2 The Safety Case body of information will include outputs from all the Safety Management activities conducted on a Project. In particular, it will include:
- a. Safety Plans;
  - b. Disposal Plans;
  - c. Hazard Log;
  - d. Register of Legislation and other significant Requirements;
  - e. Minutes of PSC meetings;
  - f. Safety Reports (eg. Hazard Identification, Hazard Analysis, Risk Estimation, Risk Evaluation);
  - g. Safety Assessment or Safety Case Reports for particular aspects of the system or activities associated with the system (eg Software Safety Case, Disposal Safety Assessment);
  - h. Safety Requirements;
  - i. Records of Design Reviews and Safety Reviews;
  - j. Results of Tests and Trials;
  - k. Incident reports and records of their investigation and resolution;
  - l. Safety Audit Plans;
  - m. Safety Audit Reports;
  - n. Records of Safety advice received;
  - o. Results of Safety inspections;
  - p. Records of Safety approvals (eg Certificates);

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- q. Minimum Equipment List (ie vital to Safe operation);
- r. Emergency and Contingency Plans/Arrangements;
- s. Limitations on Safe Use;
- t. Master Data and Assumptions List;
- u. Evidence of compliance with Legislation and Standards;
- v. Evidence of adequacy of tools and methods used.

**6 REQUIRED OUTPUTS**

6.1.1 The primary outputs of the Safety Case are an identified and controlled body of information relating to the Safety of the system, supporting a documented and reasoned argument that allows a claim to be made that the system is tolerably safe.

6.1.2 The physical outputs of the Safety Case are the Safety Case Reports. These are the means by which the IPT Leader demonstrates that all of the safety issues relating to the Project have been brought to a condition appropriate for the stage in the life cycle.

**7 DESCRIPTION**

**7.1 Arrangements for Production of Safety Case Documentation**

7.1.1 The Project SMP must:

- a. Identify the person responsible for overseeing the production of the safety documentation.
- b. Define the process for approval of the safety documentation, both within and external to the IPT.
- c. Describe the arrangements in place to:
  - i. prepare, review and assess safety documentation pertaining to design, construction, manufacture, operation and disposal/decommissioning,
  - ii. show how safety documentation is categorised in accordance with its safety significance,
  - iii. have such documentation produced by Suitably Qualified and Experienced Persons,
  - iv. have the documents approved at the appropriate level and reviewed at appropriate intervals.
  - v. where necessary, have the document reviewed by independent, Suitably Qualified and Experienced Persons,
  - vi. where necessary, submit documents to Safety Regulator(s) and/or

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approval Authorities external to the IPT;

- d. Describe the requirements for safety documentation to cover procurement, commissioning, operation, maintenance, modification and decommissioning of equipment or systems, and supporting infrastructure if appropriate.

## **7.2 Necessary Evidence in the Safety Case**

7.2.1 As a minimum, the Safety Case should provide evidence that:

- a. All Safety Requirements, including relevant process and procedural Safety Requirements, have been met, or there is adequate mitigation for failures to meet the Safety Requirements.
- b. The set of Safety Requirements is valid, ie they have been derived by thorough analysis of appropriate specifications and artifacts, and that they correspond to the system as designed and implemented.
- c. That the assessment undertaken is appropriate to the equipment and level of risk identified.
- d. Derived Safety Requirements are traceable to and from their source,
- e. Derived Safety Requirements are sufficient to meet Safety Requirements from which they are derived.
- f. The Safety Management System has been implemented as defined.
- g. The staff undertaking key roles with defined responsibilities had the appropriate competencies for those roles.
- h. All applicable legislation, regulations, Standards and MOD policy have been complied with.
- i. All contractual safety requirements have been met.

## **7.3 Development Through the Life cycle**

7.3.1 There should be a seamless development of the Safety Case from one Project phase to the next, building on the core of data and information. A Safety Case should begin at the formative stages of the project with high level Safety Assessment of project requirements (performance requirements, targets and criteria). Specific safety requirements arising from such assessment should be fed back into project requirements and the PSP as part of the continuous management process.

7.3.2 During system development, Safety Case Reports show the progress in risk reduction and producing safety evidence. In operation they support the operational use of the system, and present data on the rate of occurrence of safety-relevant events and remedial action, if any, needed to preserve safety.

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- 7.3.3 During the Assessment, Development and Manufacture phases, Safety Case Reports should be produced and updated as the design and development progresses. The following are considered the minimum required (see also **Guidance Sheet SMP12/G/02 - Safety Cases during the Project Life Cycle**):
- a. At Main Gate setting out the issues to be dealt with and the strategy to be followed to achieve the requirements.
  - b. Prior to System Acceptance, or as part of the assessment process – to demonstrate that the agreed levels of Safety performance have been achieved or solutions have been identified.
  - c. Prior to User Trials – to ensure that risks to MOD personnel, others and facilities etc. are under control (particularly where safety and operating documentation is incomplete and training may be only partial).
  - d. Prior to production – to confirm that productionisation has not reduced the level of Safety performance achieved during the design stages.
  - e. Prior to Introduction to Service – to confirm that all necessary prerequisites (eg facilities) and management arrangements (eg training courses, logistic support) are in place to maintain the predicted level of Safety performance throughout the in-service phase.
- 7.4 Ownership and Administration**
- 7.4.1 Irrespective of contractual arrangements, IPT Leaders have a special responsibility for delivering capability and managing most forms of risk. The IPT Leader is thus appointed custodian of the entire Safety Case, responsible for co-ordinating all safety activities, with specifically delegated responsibility for construction and maintenance of the Safety Case and for elements of the SMS associated with Design Authority, including oversight and compilation of all safety justifications.
- 7.4.2 Severe degradations in material state and/or invalid certification will demonstrate a clear failure in safety management arrangements that may undermine justifications with a safety case.
- 7.4.3 Responsibility for the production or maintenance of the Safety Case may change over the system life, but the IPT Leader retains ultimate ownership of the Safety Case. The Contractor (who may also change through the life of the system) will often develop and maintain the Safety Case through the life of the system on behalf of the IPT Leader.
- 7.4.4 Even where the scope of the Contractor’s activities is limited to a part of the system life, the Safety Case should still address the entire life of the system. This should ensure that safety issues are not neglected until it is too late to do anything about them.
- 7.4.5 The Contractor cannot produce a Safety Case in isolation. Significant input from the

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IPT, Users and other organizations where appropriate, will be required, particularly in relation to operational safety. The Contractor should work closely with the IPT Leader to ensure that all parties are aware of the scope of their involvement and that they deliver what is expected from them.

7.4.6 The Safety Case documentation and other material may pass from one Contractor to another during the life of the system, including when the system is accepted into service. Although the Safety Case is owned by the IPT Leader, how and when the Safety Case will be delivered should be clearly defined and agreed.

**7.5 Approval and Authorisation within the IPT**

7.5.1 Authorisation of a Safety Case Report by the IPT Leader indicates their satisfaction with the progress of the Safety Case and their acceptance of the safety risks associated with the project. The Authorised SCR forms an auditable record.

7.5.2 Before Authorisation, the IPT Leader must ensure the satisfactory resolution of any deficiencies or observations raised by their advisors, including the PSC and ISA (if appointed).

**7.6 Endorsement by Authorities Responsible for Regulation, Certification and/or Approval**

7.6.1 For those systems being acquired under a formal regulatory regime, the Safety Case should include the documentary evidence that supports the submission to the regulator. Any certificates or other approval notifications confirming that the relevant regulatory requirements have been met should be included within the Safety Case. Such approvals/certificates may also be associated with particular Safety Requirements.

**7.7 Review of the Safety Case**

7.7.1 Throughout the life of the system, the evidence and arguments in the Safety Case should be challenged in an attempt to refute them. Should evidence arise which undermines a previously accepted argument, the validity of the whole Safety Case should be questioned and the safety of the system be re-assessed. In such cases it may be necessary to obtain further evidence, carry out remedial action or even take the system out of service, depending on how seriously the Safety Case has been undermined by this counter-evidence.

7.7.2 The Safety Case is a live set of documentation that should be reviewed and updated as the system progresses through its life. For example, specific safety requirements for the disposal of a system element may emerge that did not apply when disposal was addressed during earlier project phases. This review process will be particularly important when a system has been in service for a long period of time. Special care is necessary when upgrading systems, as part of a mid-life update for instance. Due regard should continue to be paid to the issue of safety as previously considered safe systems can become unsafe over time.

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**8 RECORDS AND PROJECT DOCUMENTATION**

8.1.1 Where relevant, the outputs from this procedure should feed into the following:

- a. SRD (System Requirements Document) – for any specific Safety requirements;
- b. CSA (Customer Supplier Agreement) – to document agreements on Safety information to be delivered by the IPT;
- c. TLMP (Through Life Management Plan);
- d. Safety elements of Initial Gate and Main Gate submissions.

8.1.2 Records of all management assessments, processes and procedures, including all decisions on mitigation and the acceptability of suitable alternatives will be held for each project within the project’s Safety Case.

8.1.3 The Safety Case will normally be held by the IPT Safety Manager, and maintained by them as up-to-date.

8.1.4 The Safety Case documentation should be subject to configuration control and it may be appropriate to use a computer-based Document Management System. It should be noted that not all the documentation will necessarily be held by MOD.

8.1.5 The Hazard Log (see Procedure SMP11 – Hazard Log) is a key part of the Safety Case.

8.1.6 A Safety Case Report provides a snapshot summary of the Safety Case at key milestones. In addition, Safety Case Reports will provide details of the progress made in managing safety since the previous report. A Safety Case Report should be structured around the safety claims for the system and the planned activities. A Safety Case Report should provide justifiable confidence that the Safety Case is, or will be, adequate and that the expected progress is being made on planned activities.

8.1.7 The contents of the Safety Case Report will vary according to the maturity of the Safety Case and the intended readership. It has two functions: firstly, to assure the IPT Leader that safety risks are being managed effectively, so it should include a clear and concise summary of the Safety Case and safety progress; secondly, to highlight key areas of risk to the operators and users, so it should provide information that will support operational decision-making, such as a decision to operate outside the design envelope

**9 RECOMMENDED TOOLS**

9.1.1 **Guidance Sheet SMP12/G/01** (Typical Content of a Safety Case Report) of this Procedure contains an example format for a Safety Case Report, it should be adapted to suit the project characteristics or phase of the programme to which it relates.

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<b>10</b>	<b>GUIDANCE</b>
10.1.1	Where it is considered beneficial, combined Safety and Environmental Case Reports may be issued for a Project. It should be ensured that the Safety and Environmental programmes are aligned as far as possible and that data is shared where relevant.
<b>10.2</b>	<b>Extent of the Safety Case</b>
10.2.1	The size and scope of a Safety Case will vary, and will be proportional to the complexity of the system and level of risk involved.
10.2.2	The extent of any Safety Case can only be decided after a preliminary, top-down Safety Assessment has been undertaken (see Procedure SMP04 – Preliminary Hazard Analysis). This consists of a brief but structured identification of tasks and issues implicit in the User Requirements and functionality, followed by a brainstorming of what associated hazards may arise.
10.2.3	It is unlikely that a Safety scoping analysis will be sufficiently detailed to give a confident assurance that all identified risks are ALARP. The results instead give guidance for subsequent work and form a logical basis for more detailed Risk Evaluation. The subsequent effort allocated during the entire Safety Assessment process should be in proportion to the nature, number and risk (likelihood and severity) of the hazards identified. The size of a Safety Case may range from a few pages, for relatively low-risk equipment, to the extensive requirements for a nuclear licence.
10.2.4	The IPT Leader must judge the level of assurance required and decide when the increasing levels of confidence as work progresses and knowledge increases, create a sufficiently robust Safety Case to stop further analysis. Appropriate Senior Managers, Commanding Officers and Central Customers should be advised when the IPT Leader is unable to mitigate a serious hazard or produce a sufficiently robust argument, due to a lack of resources, unavailable information or inadequate stakeholder support. Recommendations should also be submitted to address these shortcomings. Where these issues prove difficult to resolve, the IPT Leader or ISA (if appointed) may approach the relevant FSMO for advice and to facilitate arbitration.
<b>10.3</b>	<b>Depth of the Safety Case Report</b>
10.3.1	Although the Safety Case comprises the complete documentation providing evidence that the system is safe, there may be a requirement to summarise the arguments in a number of forms according to the defined readership. For example, the IPT Leader would require a concise summary (an Executive Summary) illustrating the strength and completeness of the arguments used and the reasons as to why the system is safe. A regulator would require considerably more in the way of technical details to support the arguments offered, with references to the low-level detailed documentation.
<b>10.4</b>	<b>Scope of Safety Claims</b>

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10.4.1 It should be recognised that Legislation includes absolute, prescriptive and proscriptive requirements, as well as those requiring Risk to be made tolerable and ALARP. Thus the Safety Requirements for an equipment or service are likely to include absolute aspects as well as Risk-based aspects. The Safety Case must therefore do more than show that all identified Risks have been made ALARP.

## **10.5 Rigour of Safety Case Argument**

10.5.1 The nature of the argument for safety will vary according to the complexity and type of system under scrutiny, and hence the rigor of argument offered will reflect the nature of the system. The Safety Case can be regarded as being a single, coherent argument for safety, but this will usually be broken down into a series of detailed arguments, which may be further broken down as appropriate. To provide an indication of the degree of rigor that will be required in the arguments offered, a safety integrity requirement for the system should be agreed between the IPT Leader, the Contractor (where relevant) and any regulatory or approval authorities.

10.5.2 In general, deductive and inductive arguments based on explicit product evidence are more credible than those that appeal to development processes. It is recommended that arguments should be developed in accordance with the following order of precedence:

- a. Deductive, where the conclusion is implicit in the evidence used to support the argument.
- b. Inductive, where the argument is firmly based on the evidence presented, but extrapolates beyond the available evidence.
- c. Judgmental, where expert testimony, or appeal to custom and practice is necessary to support the conclusion.

## **10.6 Review of Safety Case Reports by the Project Team and Panel**

10.6.1 A Safety Case Report should be produced at key milestones and as a periodic status report on the safety of the developing system. Their content and delivery points should be contractually agreed between the Contractor and the IPT Leader and be defined in the Project SMP. Typically for a major project, Safety Case Reports would be produced at the following times:

- a. Approval of the project Business Case at Initial Gate;
- b. Approval of the project Business Case at Main Gate;
- c. Clearance to begin Demonstration trials;
- d. Completion of the major aspects of design, (design baseline agreed);
- e. Commitment to production;

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- f. Clearance to begin testing/acceptance/User trials;
  - g. Introduction to Service;
  - h. Significant changes to the design or material state (eg mid-life update);
  - i. Significant changes in operational usage;
  - j. Disposal.
- 10.6.2 Authorisation of the Safety Case Report signifies that the IPT Leader has taken best and competent advice and that all identified risks have been addressed. Prior to the SCR's authorisation, any risks that cannot be reduced to ALARP, should be recorded in the Hazard Log as uncompleted actions and included in the PSP and Safety Case Report for corrective action in the next phase. All PSC members should agree the interfaces and responsibilities for such outstanding actions defined within the Safety Plan. Where risks cannot be mitigated further, IPT Leaders should either seek a judgement on military ALARP, or additional resource from a Senior Manager, who in turn may notify the Functional Safety Board, of concerns regarding resource shortfalls.
- 10.7 Review and Approval of Assumptions**
- 10.7.1 The Safety Case, particularly early in the life cycle, is likely to be built on several assumptions. These may be for issues where direct evidence is not yet available (eg trials results), but the strength of the Safety Claims depends on the realism and credibility of these assumptions.
- 10.7.2 It is important that assumptions which cannot be replaced by evidence should be reviewed and agreed by the stakeholders with direct subject matter knowledge. This review and agreement should be sought early rather than when the Safety Case Report including the assumptions is being reviewed. A mechanism for this is to document the assumptions in a standalone report (eg Master Data and Assumptions List or MDAL). The MDAL can be issued, reviewed and updated well before the production of the Safety Case Report.
- 10.8 Justification of Assessment Processes**
- 10.8.1 The robustness of the Safety Case is dependent on the appropriate techniques being applied at the right time to ensure that risks are properly identified, are fully understood and attract the appropriate level of mitigation. The techniques and processes used to undertake these activities should be demonstrated in the Safety Case as being adequate.
- 10.9 Retention of Safety Information**
- 10.9.1 MOD policy for retaining safety related information is to comply fully with the requirements of civil statute. Where personnel are exposed to a hazard to health, the

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latest information available to the FSMOs is that specific legal requirements for keeping records are for:

- a. exposure to hazardous materials or related occupational disease health surveillance records, (eg including asbestos and lead) are to be kept for forty years after any incident or exposure;
- b. exposure to biological agents for ten years after any incident;
- c. health surveillance records on ionising radiation for fifty years after any incident;
- d. compartment air monitoring for exposure to hazardous substances must be kept for forty years after the incident;
- e. personnel breathing apparatus records (including compressed gases) are to be kept for forty years after any incident;
- f. general work place monitoring, test or maintenance records of control equipment to be kept for five years after any incident;
- g. respiratory protective equipment records for two years after any incident;
- h. personal accident records (medical) for three years after any incident;
- i. general health and safety records (eg noise assessments and work-place Risk Evaluations), where the process of assessment is on-going, remain valid until a new assessment is made;
- j. monitoring and documentation retention of nuclear plant safety and munitions disposal are specified by the Naval Authority;
- k. where there is no statute stipulating information retention times for specific hazards, the MOD Legal Advisor advises that safety related documentation (eg Safety Cases and safety certification) should be kept for ten years after equipment disposal. When equipment is sold, all such pertinent documentation should be handed to the new Delegated Authority.

10.9.2 Departmental SMSs should ensure that records are retained and instruct Delegated Authorities and others to comply with the departmental regulations, forwarding any data collected in their respective areas.

**10.10 Disclosure of Safety Information**

10.10.1 The Public Interests Disclosure Act permits the exemption of MOD establishments and operational training areas from disclosing sensitive information. However the SofS is unlikely to seek a dis-application unless there is strong evidence that the release of information required by civil statutory regulations would seriously compromise national security or the achievement of operational goals.

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10.10.2 In general, all unclassified safety documentation should be readily retrievable and made available for inspection by other government departments, safety regulators and authorised public representatives.

### **10.11 Hierarchy of Safety Cases**

10.11.1 Where a system includes sub-systems that have separate Safety Cases, these Safety Cases should be integrated, or reconciled, with the system Safety Case. This will assist in demonstrating that interface and other safety issues have been managed effectively, and that assumptions and cascaded Safety Requirements have been properly addressed.

10.11.2 If the equipment is part of a larger system (eg integrated onto a Platform or arranged in a “system of systems”), then the Delegated Authority responsible for the higher level system must be satisfied that the Safety performance of the equipment is adequate. These Safety performance requirements should be taken into account in setting the requirements for the equipment (see Procedure SMP10 – Safety Requirements and Contracts) and will be covered by the system acceptance process.

### **10.12 Safety Case(s) for Options**

10.12.1 Where an IPT is considering more than one option for a given capability, a generic Safety Case must be initiated pre Initial Gate which must be developed for each proposed option during the Assessment Phase. As potential options are eliminated, the respective Safety Case may be closed off, but retained for future reference.

### **10.13 Safety Cases for Systems with Variants etc**

10.13.1 A single Safety Case Report may be written to cover several minor variations of a system, through the use of Appendices for each variant or by using compatibility matrices.

### **10.14 Safety Case Caveats and their Removal**

10.14.1 It may be necessary for a Project to proceed through a key milestone with incomplete information on some Safety issues. For stages of the project where people are exposed to the equipment (eg trials, training and in-service usage), the Delegated Authority must carefully consider how this information shortfall can be addressed.

10.14.2 If it is decided to proceed with “caveats” on the Safety Case, then the Delegated authority shall consider carefully factors such as:

- a. How are the caveats or limitations on usage to be promulgated to those who need to know?
- b. How is compliance with the caveats or limitations to be enforced?
- c. Do the caveats or limitations introduce additional Hazards or increase the Risks associated with any known Hazards?

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d. If there are multiple caveats or limitations, might they interact in some way that degrades Safety?

10.14.3 It is important that the need for caveats or temporary limitations is considered in a systematic way and not hurried due to Project pressures to achieve the milestone.

10.14.4 The process for removal of caveats must also be carefully planned, including the use of reviews and application of the normal approvals process.

**10.15 Use of Existing Safety Information**

10.15.1 In some instances, the IPTL may base the Safety Case on data that already exist; for example from civilian certification authorities or other Nations' approval regimes. If these data are to well-known standards, the IPTL may decide to provide justification, in the Safety Case, as to why he is content to dispense with or reduce the scope of other safety analyses and independent tests and trials.

10.15.2 The value that may be attached to data about previous experience and use of the system should be discussed with the IPT Leader and any certification authority involved. For such data, the Contractor should demonstrate its applicability to the updated system.

**10.16 Retrospective Application**

10.16.1 For legacy equipment where the design has already been accepted by MOD, or equipment is already in-service, and no Safety Case exists, a Safety Appraisal is to be undertaken. A Safety Appraisal is aimed at ensuring that all the hazards presented by a piece of equipment or a system are understood and that adequate measures are in place to manage those hazards.

10.16.2 For projects that have reached this stage in their life-cycle, the majority, and most likely all, of the hazards present should already have been identified and measures taken to control them. Whether this is the case or not, the Safety Case, based on the Appraisal, will provide the formal record of the system under review, the hazards identified, any analysis and assessments made, and actions taken to mitigate the hazards, and manage any residual hazards.

10.16.3 Where legacy equipments are being subjected to a Safety Appraisal, the output of the Appraisal will be a Safety Case Report. The assessment should be based on a top down review of the likely safety risks presented by the equipment in its operational roles, and experience with the equipment eg accident and defect records, as well as anecdotal evidence. It should examine, or audit, the extant arrangements for ensuring safety and its support, against the likely risks identified in the assessment. Any identified shortfalls in the adequacy of arrangements should be recorded, and recommendations should be made to ensure that the required level of Safety can be sustained.

10.16.4 The extent of the work required will depend upon the age and condition of the

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equipment, the hazards associated with the system and the effort required to demonstrate that the risks are ALARP. An appraisal of the future exposure to risk during the remaining service life is an important factor in the level of study undertaken.

**10.17 What if the Safety Case Concludes that the System is not Safe Enough ?**

- 10.17.1 The Safety Case may not be able to conclude that the system is adequately Safe for its given application and given environment. In such situations, the Safety Case Report must identify the areas of shortfall and provide a clear conclusion that the system is not considered to be adequately safe.
- 10.17.2 The Safety Case Report should also record the measures taken to reduce Risk and the reasoning why any other identified strategies for Risk reduction have been judged not to be “reasonably practicable” (see Procedure SMP09 – Risk Acceptance).
- 10.17.3 It should be recognised that it is a valid outcome for the Safety Case to conclude that the system is not safe enough. Nevertheless, the application of the Safety Case approach should ensure that such conclusions are identified early in the life cycle before the expenditure of too much time and cost on development routes which will not have adequate Safety performance.
- 10.17.4 If specific risks are identified and evaluated as being “Unacceptable” even after the application of all practicable risk reduction measures, then details of this must be raised up to 2\* level within the TLB for discussion and resolution at 2\* level with Equipment User (see SMP09 – Risk Acceptance). Agreement in writing must be referenced in the Hazard Log and included in Safety Case Report, defining the circumstances under which risk exposure is considered acceptable and explaining why (eg the over-riding military necessity under particular conditions).

**10.18 Safety Case as Good Practice**

- 10.18.1 The Safety Case concept is considered best-practice because:-
  - a. it has a Safety Assessment of risk at its core, which facilitates the prioritisation of effort and the judgement of what is a disproportionate use of resources;
  - b. almost all highly complex industries, particularly those involving hazardous processes are now regulated through a Safety Case;
  - c. common law considers written evidence (safety justifications) to have more weight than verbal testimony, making a written SMS, prioritised by a Safety Assessment, essential for the discharge of legal obligations;
  - d. structured, written records of safety decisions (the Safety Case) mitigate against high MOD staff turnover and the problems that large organisations historically have with corporate memory;
  - e. information developed within system specific Safety Cases can be developed and reused for similar system types, facilitating feed-back of lessons learnt and

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economies of scale;

- f. Safety Cases, efficient SMSs and a robust Safety Culture reduce whole life costs, facilitating better change management, business improvement, improved morale and efficiency by reducing accidents;
- g. Risk Management allows innovative approaches and facilitates the incorporation of Engineering Judgement, which works well in the Defence industry sector where decisions are complex and value judgements are often required.

### **10.19 Review and Revision of Safety Case and Re-Issue of Safety Case Report**

10.19.1 Where a change to the system is an equipment/capability change that is not covered by the existing Safety Case, the Case is to be revised with a description of the change and the evidence for Safety following the change. The Safety Case Report. Should be revised as follows:

- a. For major changes or changes with a large safety impact, as a complete re-issue of the previous Safety Case Report.
- b. For minor changes with little safety impact, as an annex to the previous Safety Case Report, providing a safety statement.

### **10.20 Domain-Specific Guidance and References**

10.20.1 Additional guidance on Project Safety Cases is contained in the following references:

- a. Land Systems: JSP 454 Issue 4:
  - i. Part 2 Section 6.3 – 6.8
  - ii. Part 2 Section 7.8
  - iii. Part 2 Annex C
- b. Ship Safety Management: (JSP 430 Issue 3):
  - i. When ships are built, refitted or maintained by shore-based personnel, SEMS are subject to land-based regulations. An IPT Leader should seek assurance from their contractor(s) that safety is properly managed at key events such as launching, dry-docking, during trials and re-commissioning. Documentary evidence should be provided that:-
    - the ship is safe to enter or re-enter service;
    - any new Hazards arising from eg maintenance activities, introduction of new systems/equipment or development of new configurations for existing systems have been incorporated into the Hazard Log;
    - Risk Management is in-place and highlighted within relevant Safety Case Reports.
  - ii. A Safety Case should be developed in accordance with the Policy when the system's application is within the maritime Functional Area. The

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Safety Case must address and communicate the risks to third parties, be they other MOD personnel, the general public, facilities or the environment via a hazard footprint. It is for the third party IPT Leader to consider the information within any Hazard Footprint and mitigate risks to their own activities accordingly, in the same manner as the equipment IPT Leader relates to a system or ship IPT Leader.

iii. Second/third-party Duty Holders may seek to use this data in their own Safety Cases, flotilla/mission Safety Assessments or Operational Analysis.

c. Airworthiness: (JSP 553 1<sup>st</sup> Edition):

i. The Safety Case described in this JSP addresses airworthiness; other aspects of aviation safety will be covered by other safety cases.

ii. The Safety Case should be subjected to independent assessment, as described in Para 2.58.

iii. Safety Cases underpin each of the two release documents: the Military Aircraft Release (MA Release) and the Release to Service (RTS).

iv. Military Aircraft Release

v. The MA Release is, inter alia, the statement on behalf of CDM to the Project Sponsor that an acceptable Safety Case has been prepared for the aircraft or equipment. It includes or references the aircraft's limitations and description. The MA Release is described in detail in Para 4.12.

vi. The approval of the initial issue of the RTS to the RTSA needs to be conducted by the nominated DE&S 2\* (DAWS or DG Log(Strike)).

vii. Release to Service

viii. The RTS is the release document giving authority for Service regulated flying. The RTS is derived from the MA Release but includes extant SDs. It is based on a Safety Case covering the as-flown configuration of the aircraft. The RTS is described in detail in Para 5.5.

d. Ordnance, Munitions & Explosives (OME): (JSP 520 Issue 2.0):

i. IPTs responsible for acquisition programmes that include OME must develop a Safety Case that, in most cases, will form part of a larger system or platform Safety Case. It is to be initiated upon identification of a new OME related capability, and will evolve as the project develops.

ii. The OME Safety Case Report must be independently reviewed and endorsed by an OSRP which will be convened by DOSG. The level at which Review Panels will be chaired and OME Safety Case Reports reviewed shall be proportional to the OME safety risks involved.

iii. OME Safety Review Panel

iv. The OSRP will be independent of the IPT. Its Chairman, appointed by D DOSG, will have delegated authority to endorse the OME Safety Case

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Report. Any significant safety concerns identified in the course of reviewing the OME Safety Case Reports which cannot be resolved within a reasonable timescale shall be referred to Director DOSG.

- v. The OME Safety Case Report must provide sufficient detail to satisfy the OME Safety Review Panel that residual risks are in the tolerable region and that the ALARP arguments are comprehensive, credible and robust, and where practicable that the system complies with relevant legislation and standards.
- vi. DOSB is required to monitor the clearance status of all OME systems. In support of this, DOSG will maintain an OME System Safety Clearance Register, and report any significant shortfalls.
- vii. At specified project milestones (see paragraph 0224) OME Safety Case Reports shall be submitted to the OSRP. All submissions of the OME Safety Case Report must include a submission statement and be sent to the Secretariat of the OSRP (Operating Procedure 2.2 refers). Where an Independent Safety Auditor is appointed by the IPT, all relevant conclusions drawn from audit reports shall be included in the OME Safety Case Report to provide support to safety arguments and declarations.
- viii. The periodicity of submission of the OME Safety Case Report to the OSRP should be proportional to the risks associated with the OME system, although as a minimum, submissions should align with major project milestones and the approvals process. In addition, submissions should be made when changes to the system or the environment have been made, which affect the intrinsic safety of the system. Chapter 4 provides guidance on what the OSRP will expect to see in OME Safety Case Report submissions throughout the life cycle. For projects which are not required to pass Initial and Main Gate (Category D projects and Urgent Operational Requirements for example), special arrangements should be made which must include endorsement of the OME Safety Case Report prior to Acceptance.
- ix. The OME Safety Case Report must be independently reviewed by an OSRP, which will be convened by DOSG. Submissions of the OME Safety Case Report should align with major project milestones, but as a minimum should be at Initial Gate, Main Gate, Acceptance to Service, Mid Life Update and changes to the design or environment which has a direct effect on the intrinsic safety of the OME system. The level at which Review Panels will be chaired shall be proportional to the Risk Level Category (see Operating Procedure 1.3). The outcome of a successful review will be endorsement, by the Chairman of the OSRP, in the form of a Certificate of Safety OME. The Panel may decide that caveats and provisos of use are appropriate, in which case the Chairman must ensure that they are clearly identified as part of the Certificate of Safety OME.

e. Nuclear Propulsion (JSP 518 Issue 2):

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- i. Chapter 3
- ii. Annex A

**10.21 Warnings and Potential Project Risks**

- 10.21.1 The warnings and potential Project Risks identified in all the other Procedures, from SMP01 to SMP11 can manifest themselves through effects on the Safety Case which brings their outputs together. In addition to these, the following other Project Risks specific to the Safety Case, have been identified.
- 10.21.2 If the authorities with a Safety approval role external to the Project are not identified and consulted early in the project, then it is likely that their information requirements will not be considered. The effects of this could include delays in achieving Safety approval, unexpected cost to provide the necessary submission evidence or failure to identify Safety requirements that prevent the introduction to service. Alternatively, the IPTL might authorise the release of the system for service use when it does not comply fully with the requirements of regulatory or approval authorities.
- 10.21.3 If the Safety Case is not reviewed on a regular basis, then it is likely not to be an accurate reflection of the system, its usage pattern and its Safety performance. Examples of counter-evidence which invalidate areas of the Safety Case might not be identified and necessary corrective measures would not be considered or taken.
- 10.21.4 If insufficient time is allowed for the review of the Safety Case Report then either problems may not be detected and rectified, or authorities may be unwilling to sign it off. This could lead to delays to the milestone covered by that Safety Case Report (eg introduction to service).
- 10.21.5 If Safety Case documentation is not well managed, then key Safety evidence may not be retained or it might not be easily found. Either of these outcomes would weaken the ability of the Safety Case to provide an auditable record of the decision making process for safety and thus the justification for current status.
- 10.21.6 If the Safety Case is not maintained consistent with the material state of the in-service system, then the Safety argument which it contains will not be credible.
- 10.21.7 If the techniques used for the safety assessment are not appropriate a weak or incomplete Safety Case will result.

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**Guidance Sheet SMP12/G/01 Typical Content of a Safety Case Report**

NB: The following document is a template for a Safety Case Report and may be tailored to meet individual project requirements.

- a. Executive Summary**
  - 1. The executive summary should enable the Duty Holder to provide assurance to stakeholders that he/she is content with the progression of work and that safety requirements have been, or will be, met by:
    - (i) Confirming that Safety Case work has been, or is being, progressed satisfactorily.
    - (ii) Confirming that all other stakeholders have acknowledged their safety responsibilities.
    - (iii) Recommending or otherwise progression to the next stage of the acquisition cycle or the next defined milestone confirming that safety risks associated with the next stage can be satisfactorily managed.
  
- b. Summary of System Description**

A brief description of the system should be provided, noting that a full System Description will be contained within the Safety Case. The summary should be sufficient to enable the boundaries and scope of the Safety Case and its interfaces with other Safety Cases to be clearly defined and understood.
  
- c. Assumptions**

Assumptions that underpin the scope of the safety case, or the safety requirements, argument or evidence, should be stated. For example, this may include numbers of personnel, training levels, operational profiles, time in service, operating environment etc.
  
- d. Progress against the Programme**
  - 1. An assessment of progress against the safety programme should be provided that describes:
    - An indication of the current status relative to the expectations documented within the programme, including an assessment of any impacts on future progress.
    - Progress on safety management since the previous Safety Case Report, including identification of any new hazards and accidents and progress on Risk Management activities.
    - Progress against agreed actions placed on stakeholders.
  
- e. Meeting Safety Requirements: The following should be included:**
  - A statement describing the principle agreed Safety Requirements.
  - A summary of the argument and evidence that demonstrates how the Safety Requirements have been, or will be, met. This will described:
    - Summary of the hazards and likely accidents associated with the system, noting the main

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areas of risk. Note: The main areas of risk will also be highlighted under the Operational Information heading. Safety requirements that are unlikely to be met, either in part or in full, with remedial/follow-up actions identified.

- Risk management actions that are outstanding identifying both the risk and the organisation responsible for its management.
- The residual risk that is, or is anticipated to be, posed by the System.
- Issues of particular sensitivity, eg use of restricted materials, or with significant project or corporate risk.
- Regulatory approvals/certificates, and any associated restrictions, that are currently in place.
- Any counter evidence found that may invalidate the Safety Case, including a description of the activities taken to address this counter-evidence
- Feedback, reporting and auditing arrangements for defects and shortfalls.
- Particular issues related to interfaces between different systems.

**f. Emergency/Contingency Arrangements**

1. A statement confirming that appropriate Emergency/Contingency Arrangements (eg procedures) have been or will be put in place and identification of any areas where such arrangements do not exist or are inadequate.

**g. Operational Information (this section will be aimed specifically at the operator). Outputs from the Safety Case that are relevant to the management of operational safety, including:**

- A description of the operational envelopes.
- Any limitations on use or operational capability.
- The main areas of risk eg Cat A/B risks.
- Relevant information that can assist the operator in balancing the operational imperative against safety risk.
- Demonstration that operating and maintenance procedures and publications have been, or will be, developed.

**h. ISA Report**

Where an ISA is engaged, a formal ISA report should be prepared for inclusion in the Safety Case Report.

**i. Conclusions and Recommendations**

Conclusions should be provided, including an overall assessment of the safety of the system and any recommendations to enable issues identified within the report to be resolved.

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- j. References**
- A list of key reference documents should be provided.
- k. Appendices**
- These may include:
- Hazard Log sheets
  - Diagrams of the Safety Case Claim and Argument structure (eg Goal Structured Notation)
  - Calculations
  - Analyses
  - List of Hazardous Materials (eg COSHH and CHIP)
  - List of lifting and manual handling Hazards, together with their weight and reference to approved lifting procedure
  - Safety certificates

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Guidance Sheet SMP12/G/02 Safety Cases During the Project Life Cycle	
<b>1</b>	<b>SAFETY CASE CONSIDERATIONS AT DIFFERENT STAGES</b>
<b>1.1</b>	<b>Concept Stage/Initial Gate Safety Case</b>
1.1.1	During the production of the User Requirement Document (URD), the ECC and the IPTL are to ensure that the safety requirements are identified and recorded in the developing Safety Case. At this early stage of the project, there will be little technical data available and the Safety Case will be in outline form, with the Risk Estimation being carried out for each business option on a functional basis. Safety assessment should test ideas embedded in initial requirements and identify hazards to facilitate safety-led design.
1.1.2	Each potential acquisition strategy may have a different safety philosophy and Safety Case. In particular, potential solutions may involve the acquisition of complete services rather than just equipments, and in these cases, the safety assessment must cover the whole service and not just the equipment design. By the end of the Concept phase, the IPTL should have developed the project safety strategy in sufficient detail to demonstrate that: the safety risks are understood; the Safety Case can be properly managed throughout the remainder of the acquisition phases; and that key milestones and acceptable feasible high level safety targets have been identified. The IPTL should describe these factors in a Safety Case Report in support of the Business Case seeking approval at Initial Gate.
1.1.3	There is likely at this stage in a programme to be a number of unknown factors, or areas that are not fully defined, the submission should identify these areas and the assumptions made, justifying the strategy for dealing with them as the programme progresses.
<b>1.2</b>	<b>Assessment Phase/Main Gate Safety Case</b>
1.2.1	The safety aspects of the Main Gate Business Case should be based on a Safety Case Report that updates and reviews the work done in the first iteration, based on improved knowledge of the options being followed. It should consider the Safety work undertaken on the possible solutions being followed, and argue the strength, and weaknesses from a safety point of view, for the recommended technical and acquisition option.
1.2.2	During the development of the SRD, the IPTL is to ensure that the technical solutions under consideration are subject to a safety assessment, and that the strategies for achieving the safety requirements are documented. Preliminary safety assessments of each of the competing technical solutions, identifying the hazards and risks through life and the strategies for their control, are to be undertaken. The ECC and the IPTL must then consider, the feasibility of meeting, or in accordance with the ALARP principle exceeding, the baseline safety criteria, for each of the potential technical solutions. The IPTL should describe these assessments in Safety Case Reports in support of the Business Case seeking approval at Main Gate.
<b>1.3</b>	<b>Demonstration/Manufacture and Trials Safety Case</b>
1.3.1	The safety of the planned Demonstration phase tests and trials must be assessed and documented to justify embarking on the trials programme. In particular, prior to the commencement of significant trials phases, the safety of the planned trials must be addressed by Safety Case Reports.

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- 1.3.2 Test and Trials can form an important role in demonstrating the achievement of safety Requirements. IPT Leaders have a duty of care to consider the risks associated with the conduct of the tests and trials they require. In particular, they should review circumstances that fall outside the assumptions regarding normal operation, so that the design intention/material state of the platform, system or equipment concerned is not compromised.
- 1.3.3 The Safety Assessment should influence how Safety requirements are demonstrated to be achieved. This might be through calculation, simulation, test, inspection, factory equipment test, user trails, with the optimum balance reflected in the Integrated Trials, Evaluation and Assessment Plan (ITEAP). The Safety Case should address the IPT Leader's responsibilities for ensuring that sufficient instruction, guidance, training and resources are available and that all those with safety responsibilities clearly understand their duties (ie the SMS in operation during the trials is appropriate).
- 1.3.4 Where Contractors conduct trials the arrangements for limiting MOD's liability may be specified contractually. The IPT Leader's representatives should ensure that the safety arrangements for attending MOD staff are adequate and that the arrangements for MOD's assets and of equipment it seeks to own are sufficient before each test or trial occurs (in accordance with the ITEAP). Such assurance will must be in place before any services personnel are contracted or co-opted for testing, approval or acceptance activities or whenever they assist in platform/system operation prior to its entry into service. Given the management complexity and the potential Hazards during Contractor Trials, it is considered best practice for IPT Leaders to commission specific Safety Assessment and raise a Trials Safety Management Plan (TSMP) for such events, as part of, or cascaded from, the PSP and the ITEAP.
- 1.4 Safety Case for Introduction to Service**
- 1.4.1 The Safety Case must be developed to support the introduction of the system to service. In particular, this must demonstrate that the prerequisites for continuing Safety during the in-service phase are adequate and in place. This could typically include aspects such as support facilities, training arrangements, competent Users and Maintainers, Logistic Support arrangements etc.
- 1.4.2 This Safety Case must be maintained throughout the in-Service life as changes are introduced to the design, the equipment's operation or the conditions under which it is used.
- 1.5 Disposal Safety Case**
- 1.5.1 The safety risks related to planned or inadvertent disposal require consideration at the earliest stages of the programme to avoid designing into the equipment hazardous features such as materials or stored energy which cannot be recovered, disarmed or made safe when required.
- 1.5.2 It should be remembered that 'Disposal' also occurs throughout life (typically from the Demonstration phase onwards) as, for example, prototypes or test articles are no longer used, consumables are discarded, lubricants changed, parts are made redundant through wear or modification, repair schemes are implemented and accident damaged systems are made safe and recovered. The IPTL must ensure that all eventual and through life disposal safety risks are addressed in the Safety Case for each phase; defining the procedures to be followed for the safe management of all disposal risks.
- 1.5.3 The IPTL is to ensure that the Safety Case addresses decommissioning and disposal of the system or equipment. The Safety Case should cover:
- a. Disposal of hazardous materials.
  - b. Safe recovery and disposal, or neutralisation of the hazard if recovery is impractical, following an incident or accident.

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1.5.4 MOD is increasingly being expected to operate in an environmentally sustainable manner. IPT Leaders should design for the disposal of systems and equipment, considering the increasing need to eventually recycle components. Systems sold at the end of life should comply with all current health, safety and environmental legislation and should not be sold in a condition that would be considered unacceptable for continued UK service.

1.5.5 The IPT Leader remains responsible for ensuring that the disposal agent (eg Disposal Sales Agency) is informed of the relevant safety issues, prior to their joint agreement as to the best contractual route for disposal. Design Authorities are reminded that they may only transfer their responsibilities to a competent body.

1.5.6 A disposal Safety Case must therefore be created for systems sold for scrap as well as for those sold or transferred on loan for further use. In cases of loan or continuing use, the IPT Leader should focus effort on confirming their contractual and legal obligations for safety in order to minimise MOD's liability for subsequent claims for compensation. Disposal customers may require evidence of a Safety Case.

Stage in Project	SCR Purpose	Authorise by IPT Leader	Endorse after IPTL Authorisation (not able to "Red Card")	Approval of Activity after IPTL Authorisation (able to "Red Card")	Comments
Initial Gate	To demonstrate, through an adequate assessment of the capability being pursued, that the potential safety risks are understood and a strategy has been developed to control them.	After reviews by: 1. Stakeholders & Subject Matter Experts (Safety Panel) 2. Independent Safety Assessors (if relevant) 3. Independent Safety Auditors (if relevant) And taking account of their recommendations		None	IG submission contains short summary of SCR.  Scrutineers examine Business Case only (not SCR itself).  IPTL should consult potential MOD Regulators (Naval Authorities & OSRP) and approval authorities under Stakeholder and SME review.
Individual Assessment Phase Option (Where necessary)	To document the Safety Feasibility for a specific Project Option	As above		None	IPTL should consult potential MOD Regulators (Naval Authorities & OSRP) and approval authorities under Stakeholder and SME review.  Document may conclude that the Option cannot be made tolerably Safe.

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Stage in Project	SCR Purpose	Authorise by IPT Leader	Endorse after IPTL Authorisation ( <b>not</b> able to “Red Card”)	Approval of Activity after IPTL Authorisation (able to “Red Card”)	Comments
Main Gate	To compare Safety of Assessment Phase options, identifying any Safety aspects which prevent an Option being taken forward.  Demonstrates that the identified safety risks can be managed and controlled for the selected Option.	As above		None	MG submission contains short summary of SCR.  Scrutineers examine Business Case only (not SCR itself).  IPTL should consult potential MOD Regulators (Naval Authorities & OSRP) and approval authorities under Stakeholder and SME review.
Demonstration Trials (Where necessary)	To demonstrate that specific Demonstration Trials using MOD facilities and/or personnel can be conducted with adequate and known level of Safety.	As above		MOD Trials Authorities	Only relevant where MOD provides Trials facilities or personnel (if MOD are only observers, they should be covered by Contractor’s SMS and Risk Assessments)  IPTL should consult potential MOD Regulators (Naval Authorities & OSRP) and approval authorities under Stakeholder and SME review.
System Acceptance	To demonstrate that System meets all Safety elements of URD and SRD.	As above		Equipment Capability Customer	SCR for System Acceptance
User Trials (where necessary)	To demonstrate that specific User Trials can be conducted with adequate and known level of Safety.	As above		Trials Authorities acting for Equipment User	
Safety Submission for Individual Hazard or Group of Hazards	To demonstrate for the System of interest that specific Hazards are managed in accordance with MOD Policy.	As above	Some Naval Authorities  OME Safety Review Panel/MLSC	Some Naval Authorities	Subset of System Safety Case relevant to a specific Hazard or Group of Hazards.  The OSRP and some Naval Authorities cannot “Red Card” Safety Case and prevent entry to service.
Introduction to Service (Release to Service)  /Major Change  (Whole System)	To demonstrate that complete System is Safe for Use within defined limits and necessary support elements (Including Disposal Strategy are in place to sustain Safe Operation through life.	As above	Some Naval Authorities  OME Safety Review Panel/MLSC	Release to Service Authorities or Nuclear Regulator  Platform authority  Some Naval Authorities	The OSRP and some Naval Authorities cannot “Red Card” Safety Case and prevent entry to service.  Platform authority may prevent System from being integrated onto his Platform, but not from entry to Service.
Disposal (where necessary)	To validate Disposal Strategy for “Out of Service”	As above		None	May be “Permissioning” Regulator for Nuclear systems

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**0 SHOWING CONFORMANCE**

**0.1 Options**

0.1.1 There are four options to demonstrate conformance when applying this system procedure:

- a. Follow the defined system procedure using the recommended guidance and tools, including allowed variations and options.
- b. Use an equivalent process and tool set generated elsewhere and document evidence of procedural equivalence.
- c. Use a bespoke process and tool set for the project and document how the bespoke procedure achieves the objectives defined for this system procedure.
- d. Where the procedure is considered to be not relevant, document the basis for this decision.

**1 INTRODUCTION**

1.1.1 A **Safety Management System** is defined in Def Stan 00-56 Issue 4 as:

“The organisational structure, processes, procedures and methodologies that enable the direction and control of the activities necessary to meet safety requirements and safety policy objectives.”

1.1.2 This procedure is concerned with ensuring that the in-service arrangements for sustaining the Safety performance of equipment introduced to service, are recognised, put in place and operated. They must also be recorded in the Safety Case to demonstrate in an auditable way that this is being achieved.

1.1.3 Several aspects of the In-service SMS will fall under the heading of “Lines of Development” (LoDs). Aspects such as personnel, training, sustainability, infrastructure and facilities must be considered in an integrated way, to ensure that the potential new military capability can be provided from the In Service Date with acceptable levels of Safety.

1.1.4 Other aspects of the In-service SMS will relate to applying Risk Management as the system changes (eg due to obsolescence, enhancement or new usage) and maintaining the Safety assurance so that it reflects the current system design and usage.

1.1.5 The In-service SMS will also deal with Safety performance monitoring and audits/inspections to ensure that levels of Risk being achieved do not increase because of slack practices or ignorance. Safety performance monitoring is covered separately in Audit & Assurance Procedure AAP02 – Monitoring and Measurement.

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<b>2</b>	<b>PROCEDURE OBJECTIVES</b>	2.1.1 This procedure is concerned with ensuring that the in-service arrangements for sustaining the Safety performance of equipment introduced to service are recognised, put in place and operated. They must also be recorded in the Safety Case to demonstrate in an auditable way that this is being achieved.
<b>3</b>	<b>RESPONSIBILITIES</b>	
<b>3.1</b>	<b>Accountability</b>	
3.1.1		The IPTL is accountable for the completion of this procedure.
3.1.2		For military aviation the responsibilities for developing an in-service SMS as defined in this procedure, rests with the Release To Service Authority (RTSA) rather than the IPTL.
<b>3.2</b>	<b>Procedure Management</b>	
3.2.1		The IPTL may delegate the management of this procedure to a member (Safety Manager) or members of the IPT.
3.2.2		It is the responsibility of the IPT to ensure that the in-service arrangements for sustaining the Safety performance of equipment introduced to service, are recognised, put in place and operated.
3.2.3		Whilst IPT Leaders responsible for Acquisition do not have the direct control to put in place all aspects of the In-service SMS, they have the key role in co-ordinating all the authorities involved and ensuring that arrangements are in place before the equipment comes into service.
<b>3.3</b>	<b>Procedure Completion</b>	
3.3.1		The Project Safety Manager will be responsible for the completion of the procedure. However, in most cases a large part of the work will be carried out by others. In all cases, PSC members and other stakeholders should be involved in providing input and completing actions.
<b>4</b>	<b>WHEN</b>	
<b>4.1</b>	<b>Identification of SMS Requirements</b>	
4.1.1		From the earliest stages of a Project, the Safety Management Plan should identify the in-service arrangements required to sustain the Safety performance of the system. These requirements can only be identified through dialogue with stakeholders, particularly the Equipment User.
4.1.2		The RACI chart which is part of the Project SMP will cover involvement with in the In-service SMS, defining the authorities and their involvement with each activity.

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- 4.1.3 The Integrated Test, Evaluation and Acceptance Plan (ITEAP) will cover all the aspects required to be in place to accept the Military Capability into service.
- 4.2 Refinement of SMS Requirements**
- 4.2.1 As the Project proceeds through its life cycle and more information is available on the design solution, the requirements for its In-service SMS can be refined in greater detail. This will usually be recorded in the Project SMP, which is reviewed and agreed by the Project Safety Panel.
- 4.2.2 As the design is finalised, the in-service SMS will also be fully defined and recorded in the Safety Case. This may be through a standalone project SMS document or as part of the SP or the Safety Case Report.
- 4.3 Confirmation that Arrangements are in Place**
- 4.3.1 Before the equipment is accepted into service, the PSC must review the arrangements that exist, or that are being put in place, to ensure that measures to manage and control risks are ready and adequate.
- 4.4 Maintenance of SMS Documentation**
- 4.4.1 The SMS defined in the Safety Case must be reviewed and updated so that it correctly reflects the arrangements in place through the In-service period.

- 5 REQUIRED INPUTS**
- 5.1.1 This procedure for the Safety Case and Safety Case Report requires inputs from:
- a. Outputs from Procedure SMP01 – Safety Initiation;
  - b. Outputs from Procedure SMP02 – Safety Committee;
  - c. Outputs from Procedure SMP03 – Safety Planning;
  - d. Outputs from Procedure SMP04 – Preliminary Hazard Identification and Analysis;
  - e. Outputs from Procedure SMP05 –Hazard Identification and Analysis;
  - f. Outputs from Procedure SMP06 –Risk Estimation;
  - g. Outputs from Procedure SMP07 –Risk and ALARP Evaluation;
  - h. Outputs from Procedure SMP08 –Risk Reduction;
  - i. Outputs from Procedure SMP09 –Risk Acceptance;
  - j. Outputs from Procedure SMP10 –Safety Requirements and Contracts;
  - k. Outputs from Procedure SMP11 –Hazard Log;
  - l. Outputs from Procedure SMP12 –Safety Case and Safety Case Report.

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5.1.2 This procedure will draw on information in the following documents, and it may also define changes that must be made to their content:

- a. TLMP;
- b. ITEAP;
- c. Project SMP including RACI;
- d. SMS Manuals of stakeholders (eg IPT, IPTs providing sub-systems, Users, authorities responsible for safe storage, transportation, disposal, inspection, audit, incident investigation etc);
- e. Customer/Supplier Agreements (or similar) defining interfaces and responsibilities for certain Safety Management activities.

**6 REQUIRED OUTPUTS**

**6.1 SMS Documentation**

6.1.1 The In-service SMS arrangements will be recorded in various places because of the many authorities involved. For instance, the SMS manuals of different IPTs, user authorities, contractors and support authorities may contain relevant information as well as other documents recording arrangements for Incident and Accident reporting and investigation.

6.1.2 The principal means of bringing together this information is through the SMP and its RACI, defining the involvement of the different authorities.

6.1.3 The Project Safety Case will contain a description of the in-service SMS in operation to ensure that the Safety performance of the equipment is achieved and sustained through life.

**7 DESCRIPTION**

7.1.1 The in-service arrangements for sustaining the Safety performance of equipment introduced to service must be recognised, put in place and operated. The different aspects of the SMS can be considered under the following headings:

- a. **Implementation of Safety Controls:**
  - i. Operation (including compliance with Safety limitations on use);
  - ii. Emergency preparedness;
  - iii. Maintenance;
  - iv. Training;
  - v. Storage;
  - vi. Transportation;
  - vii. Disposal (eg: consumables, damaged items, LRUs at end of their life).

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- b. **Safety Information Management:**
  - i. Incident and Accident data;
  - ii. Suggested Safety improvements;
  - iii. Maintenance of Hazard Log;
  - iv. Maintenance of Safety Case;
  - v. Maintenance of SMP (including Disposal Plan);
  - vi. Monitoring changes to Safety legislation;
  - vii. Provision of Safety information to other stakeholders;
  - viii. Receipt of Safety information from other stakeholders;
  - ix. Archiving of Safety information.
- c. **Safety Performance Reviews and Continuous Improvement:**
  - i. Reactive (incident reporting, investigation and corrective action);
  - ii. Planned (audit and inspection);
  - iii. Safety Performance monitoring;
  - iv. Review for changes in system usage which might affect Safety;
  - v. Comparison of achievement with expectations;
  - vi. Continuous Improvement;
  - vii. Audit of the in-service SMS (self/peer/independent as required).
- d. **Configuration Management:**
  - i. System build standard (hardware and software) – Safety consideration as an integral part of configuration control;
  - ii. Obsolescence management;
  - iii. Documentation (Safety consideration as part of documentation configuration control – eg Operator and Maintainer Manuals, Training syllabus).
- e. **Risk Management (eg for modifications and enhancements):**
  - i. Hazard Analysis;
  - ii. Risk Estimation;
  - iii. Risk and ALARP Evaluation;
  - iv. Risk Acceptance.
- f. **Lines of Development:**
  - i. Personnel (eg manpower numbers);
  - ii. Training (eg. individual and collective);
  - iii. Facilities and Estates (eg infrastructure and training facilities required to support the system in service through to disposal);
  - iv. Sustainability (eg resources, spares and support to sustain safe operation);
  - v. Concepts & Doctrine (eg military tactics, techniques and procedures and their interaction with the safe use of the equipment);
  - vi. Equipment & Technology (eg integration into systems of systems,

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including interface and interoperability issues to consider for Safe operation).

7.1.2 The Risk Management of the system during development will result in several control measures which will determine requirements on the in-service SMS. The Safety Case will also identify SMS prerequisites on which the achievement of tolerable Safety depends. The Safety Case must show that these have been put in place and are effective.

7.1.3 The SMS description must identify the responsibilities and interfaces for all aspects of the defined in-service SMS, particularly because many different authorities are likely to be involved.

**8 RECORDS AND PROJECT DOCUMENTATION**

**8.1 General**

- 8.1.1 Where relevant, the outputs from this procedure should feed into the following:
- a. SRD (System Requirements Document) – for any specific Safety requirements;
  - b. CSA (Customer Supplier Agreement) – to document agreements on Safety information to be delivered by the IPT;
  - c. TLMP (Through Life Management Plan);
  - d. Safety elements of Initial Gate and Main Gate submissions.

**8.2 SMS Documentation**

- 8.2.1 The In-service SMS arrangements will be recorded in various places because of the many authorities involved. For instance, the SMS manuals of different IPTs, user authorities, contractors and support authorities may contain relevant information as well as other documents recording arrangements for Incident and Accident reporting and investigation.
- 8.2.2 The principal means of bringing together this information is through the SMP and its RACI, defining the involvement of the different authorities.
- 8.2.3 The Project Safety Case will contain a description of the in-service SMS in operation to ensure that the Safety performance of the equipment is achieved and sustained through life.

**9 RECOMMENDED TOOLS AND FORMS**

- 9.1.1 Not applicable.

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**10 GUIDANCE**

**10.1 General Guidance**

10.1.1 Before a system enters service, any residual risks and their proposed, or actual mitigations, should be examined and a case made that all necessary controls are in place. These are likely to include:

- a. Arrangements for training – do the courses match the training requirements set out in the Safety Case, are courses available, are the first users and maintainers trained?
- b. User and maintainer documentation – has it been approved and issued?
- c. Support Arrangements, Maintenance Policy, ILS etc. – have they been implemented?
- d. Limitations or restrictions on operation – where they are needed, have they been published?
- e. Emergency and Contingency arrangements – are these in place and do they meet the requirements?

10.1.2 The adequacy of the existing in-service SMS should be reviewed when:

- a. Modifications to the equipment are introduced;
- b. There is a change in use;
- c. There are changes in legislation requiring retrospective action to ensure compliance;
- d. On disposal.

10.1.3 In addition, the adequacy and effectiveness of the In-Service SMS can be examined as part of a detailed Safety Audit or Inspection or during a periodic major review of the Safety Case.

**10.2 Domain-Specific Guidance and References**

10.2.1 Additional guidance on the in-service SMS is contained in the following references:

- a. Land Systems: JSP 454 Issue 4 Part 2:
  - i. Part 3 Safety Case Section 6.5 .
- b. Ship Safety Management: (JSP 430 Issue 3):
  - i. Section 8 Safety Case Implementation (8.3.1)
- c. Airworthiness: (JSP 553 1<sup>st</sup> Edition):
  - i. For military aviation the responsibilities for an in-service SMS as defined in this procedure rests with the Release To Service Authority (RTSA) rather than the IPT Leader.

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- ii. Chapter 5 In-Service Safety Management System (5.3 and 5.4)
    - d. Ordnance, Munitions & Explosives (OME): (JSP 520 Issue 2.0):
      - i. Chapter 2 In Service OME Management 0229 to 0232.
    - e. Nuclear Propulsion (JSP 518 Issue 1.2):
      - i. Annex A In Service (A109, A110 and A111)
- 10.2.2 The DASMS as set by the DASB on behalf of the Defence Environment and Safety Board (DESB) is an overarching Safety Management System (SMS) which sets out Defence Aviation safety management policy, organization and the function of the Defence Aviation Safety Centre (DASC). Guidance on the key elements of Defence Aviation organizations SMSs, which in turn may require further detailed SMS at lower levels, is also provided.
- 10.3 Warnings and Potential Project Risks**
- 10.3.1 If the requirements for the in-service SMS are not identified at an early stage of the project, then suitable arrangements may not be put in place. This could result in delays in bringing the system into service or in an inability to sustain the necessary level of Safety performance in-service.
- 10.3.2 If the stakeholders do not agree the responsibilities and interfaces for the in-service SMS, then there may be gaps and it may not be adequate to sustain the necessary level of Safety performance.
- 10.3.3 If the status of the arrangements for in-service SMS are not confirmed as adequate before the equipment is brought into service, then it is possible that the necessary level of Safety performance will not be achieved or sustained.
- 10.3.4 If the in-service SMS is not documented (eg in the Safety Case, TLMP or SMP), then there will not be documentary evidence to demonstrate that it is complete and adequate. If there were to be a Safety incident, it would be difficult to argue that the arrangements were effective and complete.
- 10.3.5 If the effectiveness of the in-service SMS is not monitored or not stimulated through audit and inspection, then it is likely that it will decay over time through sloppy practice or ignorance.
- 10.3.6 If the in-service SMS is not developed over time, then it may become inappropriate and less effective as changes happen to the system, its support, usage or the organisational structures of authorities involved in the SMS.

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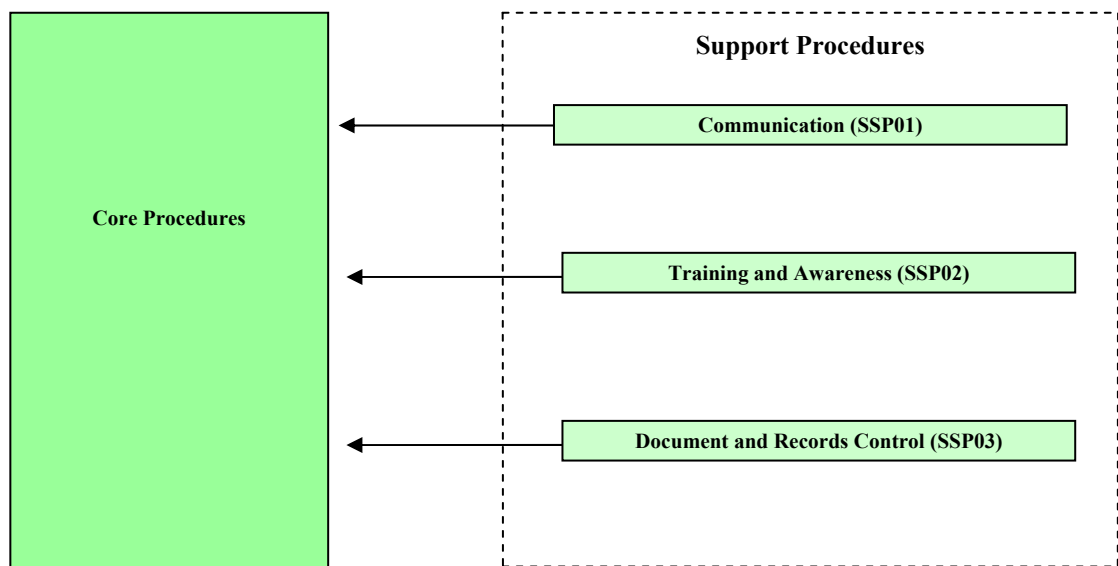
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## 7. SUPPORT PROCEDURES

Table 7.1: POSMS and POEMS Support Procedures

Number	Procedure Type	Procedure Name
SSP01a	Support Procedures	Communications - IPTs
SSP01b	Support Procedures	Communications - ASEG
SSP02a	Support Procedures	Training and Awareness - IPTs
SSP02b	Support Procedures	Training and Awareness - ASEG
SSP03a	Support Procedures	Document and Record Control - IPTs
SSP03b	Support Procedures	Document and Record Control - ASEG

Figure 7.1: The Support Procedures



### 7.1 Procedure Structure

7.1.1 For ease of use, the procedures have the same format and structure. The key sections are:

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## 7.2 Procedure Title

7.2.1 The title and reference code for the procedures are as follows:

- EMP for core POEMS procedures;
- SMP for core POSMS procedures;
- SSP for support procedures;
- AAP for assurance and audit procedures.

7.2.2 Note that support and assurance and audit procedures are common to both the POEMS and POSMS.

## 7.3 Showing Conformance

7.3.1 This explains the three ways of showing conformance with the procedure. This is different to the core procedures which have four ways of showing conformance. The reason for this difference is that it is not acceptable within POSMS or POEMS for the support procedures to be considered ‘not relevant’.

## 7.4 Introduction

7.4.1 This is an overview of the procedure’s purpose in the context of the overall management system.

## 7.5 Procedure Objectives

7.5.1 This section describes what is to be achieved by following and completing the procedures. Normally the section is in the form of a list of the objectives that need to be achieved in order to demonstrate conformance.

## 7.6 Responsibilities

7.6.1 This section states who will be accountable and responsible for proper completion of the procedure and who will actually carry out the actions within the procedure. Two versions of each support procedure have been produced to reflect the different levels of responsibilities of IPTs and ASEG within POSMS and POEMS.

## 7.7 When

7.7.1 This section indicates when the procedure is most likely to be followed. For the core procedures this is usually a stage or stages of CADMID. However, for the IPT support procedures, this will usually be when the SMS and EMS are implemented, although the system does not have to be complete for the procedure to apply. For ASEG’s support procedures, application will be ongoing from the

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introduction of POSMS and POEMS until they are withdrawn from use or replaced.

## **7.8 Required Inputs**

7.8.1 Most of the procedures require reference to be made to the outputs of previous procedures and information from other sources. This section lists the main reference material that will be needed in order to complete the procedure.

## **7.9 Required Outputs**

7.9.1 This lists the procedure's outputs, for example completed forms, compiled information etc. It should be noted, however, that it is acceptable within POEMS for alternative methods to be used to those outlined in the procedures providing this is endorsed by ASEG.

## **7.10 Records and Project Documentation**

7.10.1 This includes advice on where outputs of the procedures should be kept and recorded (usually in the Safety or Environmental Case, Case Reports, or related registers and logs) and where other project documentation may also need to include some or all of the output information.

## **7.11 Description**

7.11.1 This section makes up the bulk of the procedure and describes the steps and stages involved in completing the procedure. It includes advice and guidance on how to complete the procedure and advice on when to use each of the associated forms or tools. It should be remembered that this part of the procedure is guidance and it is not therefore mandatory for an IPT to follow it to the letter where they have made suitable and equivalent alternative arrangements. The key point is to achieve the required objectives, outputs and outcomes, and to ensure that alternative approaches are clearly documented and agreed.

## **7.12 Recommended Tools and Forms**

7.12.1 Many of the procedures include tools or forms to assist IPTs and ASEG to undertake the actions outlined in the procedure or to record the information produced. This section lists the forms that may be useful in completing the procedure. This can sometimes include forms associated with other procedures. Note that the use of the forms is not mandatory (see Required Outputs above) but that any alternative approaches used should be clearly documented and agreed.

## **7.13 Guidance**

7.13.1 This final section provides guidance on other sources of advice and guidance. Also included in this section of the IPT procedures are some general comments on

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potential project risk that may arise if the procedure is not completed in an appropriate way or at an appropriate time.

## **7.14 Procedure Use**

- 7.14.1 Separate procedures have been written for IPTs and ASEG. This is because there are distinct differences between their responsibilities relating to POSMS and POEMS. IPTs are responsible for applying POSMS and POEMS at a project or IPT level whilst ASEG's prime responsibility is the provision of guidance to IPTs in their implementation role by providing suitable advice and guidance. The procedure numbers either end in 'a' (for IPT procedures) or 'b' (for ASEG).
- 7.14.2 For those procedures that apply to IPTs it is envisaged that the completion of the procedure will be carried out by a member of the IPT although this may be delegated to a third party if desired. The ASEG procedures should be completed by ASEG although some activities may be delegated to advisors or contractors eg training delivery.
- 7.14.3 All support procedures provide recommended guidance and/or forms to help the user to produce the desired output(s). The use of this guidance is not mandatory, as long as suitable alternative methodologies are used which achieve the desired objectives, as defined in the procedure and that are deemed by ASEG to be equivalent. Therefore three options exist when following the procedures, to demonstrate conformance:
- Follow the defined system procedure using the recommended guidance and tools, including allowed variations and options.
  - Use an equivalent process and tool set generated elsewhere and document evidence of procedural equivalence.
  - Use an equivalent bespoke process and tool set for the project and document evidence of procedural equivalence.
- 7.14.4 This is slightly different from the core procedures which had a fourth option to cover situations where the procedure was not considered relevant. However, the support procedures will always be relevant and therefore this option has been removed.
- 7.14.5 Table 7.2 which can be found overleaf shows a summary of the responsibilities, timing, inputs and outputs associated with each support procedure.
- 7.14.6 The support procedures are designed to meet the requirements of the relevant clauses of both ISO 14001 and OHSAS 18001 (See Table 2.2 Chapter 2) and follow the same structure as the core procedures (see Chapter 6).
- 7.14.7 If a project management system or procedures (ISO 9000 or otherwise) already exists within the IPT or ASEG then this may be used as an alternative to the support procedures so long as ASEG is satisfied it meets the same objectives.

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**Table 7.2: Summary of support procedures**

Procedure	When *	Input	Output **	Responsibility ***
SSP01a – Communication - IPTs	Concept	<ul style="list-style-type: none"> <li>• <b>SMP01/F/02</b> – Register of Stakeholder Requirements and Information</li> <li>• Requests for information (external or internal)</li> <li>• Any existing communication arrangements within the IPT</li> </ul>	Documented arrangements for: <ul style="list-style-type: none"> <li>• Managing any planned internal or external communications on the IPT’s SMS or EMS (<b>Form SSP01a/F/01</b> – Communications Plan).</li> <li>• Responding to internal and external queries on project related safety and environmental issues;</li> <li>• Recording inward and outward communications (<b>Form SSP01a/F/02</b> – Communications Log);</li> <li>• Recording the IPT’s decision on whether or not to report publicly on safety and environmental project information.</li> </ul>	IPTs
SSP01b – Communication - ASEG	Continuous	<ul style="list-style-type: none"> <li>• Any existing communication arrangements within ASEG</li> </ul>	Documented arrangements for: <ul style="list-style-type: none"> <li>• Managing planned internal and external communications, about the POEMS and POSMS (<b>Form SSP01b/F/01</b> – Communications Plan);</li> <li>• Responding to POEMS and POSMS related queries received from both internal and external sources;</li> <li>• Recording inward and outward communications (<b>Form SSP01b/F/02</b> – Communications Log).</li> </ul>	ASEG
SSP02a – Training and Awareness – IPTs	Concept	<ul style="list-style-type: none"> <li>• Project Safety Management Plan (from SMP03).</li> <li>• <b>AAP01a/G/01</b> – Auditor Competency Interim Guidance;</li> <li>• <b>SSP02a/G/01</b> – Environmental Competency Interim Guidance;</li> <li>• Any existing management arrangements for training</li> </ul>	<ul style="list-style-type: none"> <li>• <b>SSP02a/F/01</b> - Training Needs Matrix;</li> <li>• <b>SSP02a/F/02</b> – General Awareness Training Declaration Form.</li> </ul>	IPTs

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		<ul style="list-style-type: none"> <li>IPT staff;</li> <li>Training records of IPT staff (and contractors/suppliers where applicable).</li> </ul>		
SSP02b – Training and Awareness – ASEG	Continuous	<ul style="list-style-type: none"> <li>Any existing arrangements or agreements relating to ASEG’s role in providing guidance to IPTs.</li> <li>Existing arrangements for training of ASEG staff.</li> <li>Any existing training records for ASEG staff.</li> </ul>	<ul style="list-style-type: none"> <li><b>SSP02b/F/01</b> - Training Needs Matrix;</li> </ul>	ASEG
SSP03a – Document and Record Control - IPTs	Concept	<ul style="list-style-type: none"> <li>Documents – Any information produced as outputs of POEMS and POSMS in any media eg paper, electronic, photographic.</li> <li>Records – Any document that states results achieved or provides evidence of activities performed (eg monitoring results, audit record etc).</li> <li>Any existing document or record control arrangements within the IPT.</li> </ul>	<ul style="list-style-type: none"> <li>Appropriately controlled documents (<b>Form SSP03a/F/01</b> – Document Log);</li> <li>Appropriately managed records (<b>Form SSP03a/F/02</b> – Record Log);</li> <li><b>SSP03a/F/03</b> - Document Change Request Form.</li> </ul>	IPTs
SSP03b – Document and Record Control – ASEG	Continuous	<ul style="list-style-type: none"> <li>Documents – All POSMS and POEMS manuals, procedures, tools and guidance.</li> <li>Records – All ASEG records relating to POSMS and POEMS eg summary audit reports, ASEG staff training records.</li> <li>Any requests received by ASEG for changes to POSMS or POEMS documents (<b>Form SSP03a/F/03</b> – Document Change Request Form).</li> <li>Any existing document or record control arrangements within ASEG.</li> </ul>	<ul style="list-style-type: none"> <li>Appropriately controlled documents (<b>Form SSP03b/F/01</b> – Document Log)</li> <li>Appropriately managed records (<b>Form SSP03b/F/02</b> – Record Log)</li> </ul>	ASEG

\* The outputs from all the procedures will require periodic review and update throughout the life cycle of the project.

\*\* Or equivalent actions and documentation that ASEG are satisfied achieve the same objectives.

\*\*\* The IPT or ASEG is responsible for managing the procedure completion. This column relates to who is responsible for completing the procedure.

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**0 SHOWING CONFORMANCE**

**0.1 Options**

0.1.1 There are three options to demonstrate conformance when applying this system support procedure:

- a. Follow the defined system support procedure using the recommended guidance and tools, including allowed variations and options.
- b. Use an equivalent process and tool set generated elsewhere and document evidence of procedural equivalence.
- c. Use an equivalent bespoke process and tool set for the project and document evidence of procedural equivalence.

**1 INTRODUCTION**

1.1.1 Effective communication of the principles, goals and outputs of the IPT's SMS and EMS will be essential to the success of managing safety and environmental risks. It is important to ensure that relevant responsibilities are understood and that actions are carried out in a coordinated and efficient way.

1.1.2 Information relating to individual projects needs to be communicated within the IPT and between IPTs as well as other parts of MOD.

1.1.3 External communication ie outside of the MOD, may also be required. This can include documenting and responding to safety and environmental information requested by interested parties which may be covered by the Freedom of Information Act or the Environmental Information Regulations.

1.1.4 External communication may also include liaising with public authorities on emergency planning and other relevant issues.

1.1.5 An IPT may also wish to proactively communicate on safety or environmental issues to a wider audience eg via a project or case file website.

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<b>2</b>	<p><b>PROCEDURE OBJECTIVES</b></p> <p>2.1.1 To establish, implement and maintain arrangements to:</p> <ul style="list-style-type: none"> <li>• Proactively communicate environment and safety information to internal stakeholders.</li> <li>• Respond to internal and external project related safety and environmental queries;</li> <li>• Record inward and outward communications on safety and environmental issues, including those covered by the Freedom of Information Act or the Environmental Information Regulations;</li> <li>• Record the IPT’s decision on whether or not to report publicly on safety and environmental project information.</li> </ul>
<b>3</b>	<p><b>RESPONSIBILITIES</b></p> <p>3.1 <b>Accountability</b></p> <p>3.1.1 The IPTL is accountable for the completion of this procedure.</p> <p>3.2 <b>Procedure Management</b></p> <p>3.2.1 IPTLs may delegate the management of this procedure eg to the IPT’s Environmental and Safety Focal Point(s).</p> <p>3.3 <b>Procedure Completion</b></p> <p>3.3.1 Safety and Environmental Focal Point(s) are likely to be responsible for the completion of this procedure although this could be delegated to a third party if desired.</p>
<b>4</b>	<p><b>WHEN</b></p> <p>4.1.1 For new projects this procedure should be undertaken as early as possible in the Concept Stage, prior to Initial Gate approval, and outputs maintained throughout the project.</p>
<b>5</b>	<p><b>REQUIRED INPUTS</b></p> <p>a. <b>EMP01/F/01</b> – Register of Stakeholder Requirements and Information.</p> <p>b. Requests for information whether from internal or external sources.</p>

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c. Any existing communications arrangements within the IPT.

**6 REQUIRED OUTPUTS**

6.1 Documented arrangements for:

- a. Managing any planned internal or external communications on the IPT’s SMS or EMS (**Form SSP01a/F/01 – Communications Plan**).
- b. Responding to internal and external queries on project related safety and environmental issues;
- c. Recording inward and outward communications (**Form SSP01a/F/02 – Communications Log**);
- d. Recording the IPT’s decision on whether or not to report publicly on safety and environmental project information.

**OR**

Equivalent actions and documentation that ASEG is satisfied achieve the same objectives.

**7 DESCRIPTION**

**Introduction**

7.1.1 For the majority of projects a Communication Plan will be needed that identifies the need, timing, purpose and appropriate method(s) for communication with project stakeholders on safety and environmental issues. This plan can cover both safety and environmental communications or the IPT can develop separate plans for these issues.

**7.2 Establish arrangements for managing planned communication**

7.2.1 In order to manage planned communications the IPT will need to identify:

- Person or group(s) that will receive communications;
- The subject matter or issues on which to communicate;
- The frequency of the communications;
- The media to be used; and
- Person responsible for ensuring it happens.

7.2.2 **Form SSP01a/F/01 – Communications Plan** can be used to record this information. Section 10 of this procedure provides guidance on communications media and the type

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of information that an IPT may need to communicate.

7.2.3 The IPT should also consider the benefit of proactively communicating safety and environmental project information externally to the IPT and document its decision. If the IPT decides this is appropriate then the relevant details should be added to **Form SSP01a/F/01** - Communication Plan.

7.2.4 Note that MOD policy encourages regular contact with regulatory authorities, local authorities, and where appropriate, pressure groups and Non Governmental Organisations (NGOs).

**7.3 Establish arrangements for managing unplanned communications**

7.3.1 In addition to the communications that are planned throughout the project there may be a need for additional communications in response to requests for information, complaints or enquiries either from internal or external sources. The IPT needs to ensure that such unplanned communications are properly managed.

7.3.2 The arrangements for ensuring this is carried out should ensure that all external requests for information, including those received from the press or TV, are replied to in accordance with existing MOD FOI and EIR policies ie that IPTs do not respond to requests for safety or environmental information without consulting and agreeing subsequent communications with the relevant FOI desk.

7.3.3 For requests that require a less than straightforward response the IPT may want to consult the Safety and Environmental Committee, ASEG or other advisors before responding in full.

7.3.4 As some requests for information may be received by third parties working on behalf of the IPT the IPT should ensure that such parties are aware of the MOD requirements for responses under FOI and EIR.

**7.4 Establish arrangements for recording inward and outward communications**

7.4.1 The IPT should establish a log for recording:

- External requests for safety or environmental information and any subsequent responses (to show compliance with the Freedom of Information Act or the Environmental Information Regulations);
- Communications to and from public or regulatory authorities; and
- Any other internal or external environmental and safety communications that the IPT considers should be formally recorded.

7.4.2 **Form SSP01a/F/02** – Communications Log can be used as a means of recording such communications.

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7.4.3	Copies of logged communications should be kept by the IPT and their location recorded in the Communications Log.
<b>8</b>	<b>RECORDS AND PROJECT DOCUMENTATION</b>
8.1.1	A copy of the information produced by following this procedure should be stored in the Project Environmental Case.
<b>9</b>	<b>RECOMMENDED TOOLS AND FORMS</b>
a.	<b>Form SSP01a/F/01</b> – Communications Plan
b.	<b>Form SSP01a/F/02</b> – Communications Log
<b>10</b>	<b>GUIDANCE</b>
10.1	<b>General</b>
10.1.1	General advice on project communication can be found in the ISO14001 and ISO14004 Standard, OHSAS 18001 and various sections of JSP418. The BS ISO14063 Environmental Management – Environmental Communication – Guidelines and Examples is also a useful reference.
10.1.2	If an existing project management system or procedures (eg ISO 9001) covers communication activities, the IPT can decide to follow these instead of this procedure so long as ASEG is satisfied that they meet the same objectives.
10.1.3	Communications media that an IPT may use to communicate on safety and environmental issues include: <ul style="list-style-type: none"> <li>• Notice boards;</li> <li>• Direct contact;</li> <li>• Meetings;</li> <li>• Telephone;</li> <li>• Emails;</li> <li>• Memos;</li> <li>• Intranet or internet;</li> <li>• IPT newsletter</li> </ul>
10.1.4	The type and extent of communications required will vary between projects and IPTs and will probably include some or all of the following: <ul style="list-style-type: none"> <li>• MOD's Safety and Environmental Policies;</li> </ul>

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- Project environmental and safety policies (where these exist);
  - Project-related safety hazards and risks and environmental aspects and impacts;
  - Project related environmental and safety legal and non-legal standards;
  - Planned/current improvements or mitigation measures;
  - Information on project and equipment system environmental and safety performance;
  - Results of audits; and
  - Changes in safety and environmental management system documentation or requirements;
- 10.1.5 The need to communicate with public and civil authorities on emergency planning and other relevant issues should also be considered. For example, if the equipment is to be based at a specific location and is likely to produce noise emissions that could affect nearby residences, the relevant authorities should be informed. Similarly, there may be a need to produce and communicate an emergency response plan if the equipment may give rise to significant safety or environmental hazards at a specific location.
- 10.1.6 Additional advice and guidance on the MOD’s response to the Freedom of Information Act is available from [www.foi@mod.uk](mailto:www.foi@mod.uk)
- 10.2 Warnings and Potential Project Risks**
- 10.2.1 Communication is an essential part of any Safety or Environmental Management System. If lines of communication are not agreed and documented from the commencement of the project there may be delays and misunderstandings later in the project.
- 10.2.2 Logging and tracking of communications and related responses are necessary to ensure that appropriate information is released or provided to relevant parties in a timely manner, and that significant communications are appropriately authorised.

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<b>MOD</b>	<b>Support Procedures</b>	Procedure SSP01a
<b>SSP01a: Communication - IPTs</b>		Page 7

Form SSP01a/F/01 – Communications Plan								
<b>Project Title:</b>								
<b>IPT:</b>								
<b>Completed by:</b>				<b>Date:</b>				
<b>Reviewed by:</b>				<b>Date:</b>				
Ref Stakeholder Register(s) (EMP01/F/01 and SMP01/F/01)	to Stakeholder	Issue/information to be communicated	Frequency of communication	Date for communication	Media to be used	Person responsible	Security issues	

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<b>MOD</b>	<b>Support Procedures</b>	Procedure SSP01a
<b>SSP01a: Communication - IPTs</b>		Page 8

Form SSP01a/F/02 – Communications Log								
Date	To	From	Method of communication (letter, fax, email etc)	Subject(s) covered	Person who received enquiry	Person who responded to enquiry	Response date	Documents stored at:

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MOD	Support Procedures	Part 1 SSP01b Page 1
SSP01b: Communication - ASEG		

0	<b>SHOWING CONFORMANCE</b>
0.1	<b>Options</b>
0.1.1	There are three options to demonstrate conformance when applying this system support procedure: <ul style="list-style-type: none"> <li>a. Follow the defined system support procedure using the recommended guidance and tools, including allowed variations and options.</li> <li>b. Use an equivalent process and tool set generated elsewhere and document evidence of procedural equivalence.</li> <li>c. Use an equivalent bespoke process and tool set for the project and document evidence of procedural equivalence.</li> </ul>
1	<b>INTRODUCTION</b>
1.1.1	Effective communication of the principles, goals and requirements of the POSMS and POEMS will be essential to their successful implementation by IPTs.
1.1.2	There is also a need for information directly or indirectly relating to POSMS and POEMS manuals to be communicated throughout the Acquisition Community to ensure that IPTs and other groups know about the latest developments, sources of further guidance, training courses, best practice etc.
1.1.3	External communication i.e. outside of the MOD, may also be required. This can include documenting and responding to safety and environmental relevant information requested by interested parties which may be covered by the Freedom of Information Act or the Environmental Information Regulations.

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<b>2</b>	<p><b>PROCEDURE OBJECTIVES</b></p> <p>2.1.1 To establish, implement and maintain arrangements to:</p> <ul style="list-style-type: none"> <li>a. Ensure that IPTs and any third parties know where they can access the latest versions of POSMS and POEMS;</li> <li>b. Proactively communicate on issues directly or indirectly related to POEMS and POSMS to IPTs and relevant stakeholders;</li> <li>c. Respond to POEMS and POSMS related queries received from IPTs and other sources; and</li> <li>d. Record inward and outward communications on safety and environmental issues, including those covered by the Freedom of Information Act or the Environmental Information Regulations.</li> </ul>
<b>3</b>	<p><b>RESPONSIBILITIES</b></p> <p>3.1 <b>Accountability</b></p> <p>3.1.1 Overall responsibility for ensuring this procedure is carried out lies with ASEG.</p> <p>3.2 <b>Procedure Management</b></p> <p>3.2.1 ASEG will be responsible for the management of this procedure.</p> <p>3.3 <b>Procedure Completion</b></p> <p>3.3.1 ASEG will be responsible for the completion of this procedure.</p>
<b>4</b>	<p><b>WHEN</b></p> <p>4.1 The applicability of this procedure is ongoing from the introduction of the POSMS and POEMS.</p>
<b>5</b>	<p><b>REQUIRED INPUTS</b></p> <ul style="list-style-type: none"> <li>a. Any existing communications arrangements within ASEG.</li> </ul>

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6	<p><b>REQUIRED OUTPUTS</b></p> <p>6.1 Documented arrangements for:</p> <ol style="list-style-type: none"> <li>a. Managing planned internal and external communications, about the POEMS and POSMS (<b>Form SSP01b/F/01 – Communications Plan</b>);</li> <li>b. Responding to POEMS and POSMS related queries received from both internal and external sources;</li> <li>c. Recording inward and outward communications (<b>Form SSP01b/F/02 – Communications Log</b>);</li> </ol> <p><b>OR</b></p> <p>Equivalent actions and documentation that ASEG is satisfied achieve the same objectives.</p>
7	<p><b>DESCRIPTION</b></p> <p>7.1 <b>Planned communications with IPTs and other relevant stakeholders</b></p> <p>7.1.1 ASEG needs to ensure that the latest versions of POSMS and POEMS (the manuals, procedures, tools and guidance) are available to all IPTs and any other relevant stakeholders. There may also be a need for communications on related issues such as:</p> <ul style="list-style-type: none"> <li>• Any revisions or modification to POSMS and/or POEMS;</li> <li>• POSMS and POEMS awareness material (eg Green and White Book)</li> <li>• Information on relevant training courses;</li> <li>• Best practice guidance for implementing POSMS and POEMS;</li> <li>• Availability of guidance for implementing POSMS and POEMS.</li> </ul> <p>7.1.2 In order to manage this process ASEG should identify:</p> <ul style="list-style-type: none"> <li>• Person or group(s) that will receive communications;</li> <li>• The subject matter or issues on which to communicate;</li> <li>• The frequency of the communications;</li> <li>• The media to be used; and</li> <li>• Person responsible for ensuring it happens.</li> </ul>

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7.1.3 **Form SSP01b/F/01** – Communications Plan can be used to record this information.

7.2 **Establish arrangements for system for managing unplanned communications**

7.2.1 In addition to planned communications there may be a need for additional communications in response to requests for information, complaints or enquiries either from internal or external sources. ASEG needs to ensure that such unplanned communications are properly managed.

7.2.2 The arrangements for ensuring this is carried out should ensure that all external requests for information, including those received from the press or TV, are replied to in accordance with existing MOD FOI and EIR policies ie that ASEG and IPTs do not respond to requests for safety or environmental information without first consulting the relevant FOI desk.

7.2.3 As some requests for information may be received by third parties working on behalf of ASEG eg contractors and consultants, ASEG should ensure that such parties are aware of the MOD requirements for responses under FOI and EIR.

7.3 **Establish arrangements for recording inward and outward communications**

7.3.1 ASEG should establish a log for recording:

- External requests for safety or environmental information and any subsequent responses (to show compliance with the Freedom of Information Act or the Environmental Information Regulations);
- Internal (ie within MOD) communications relating directly or indirectly to POSMS and POEMS eg reissue of manuals.
- Any other environmental and safety communications that the IPT considers should be formally recorded.

7.3.2 **Form SSP01b/F/02** – Communications Log can be used as a means of recording such communications.

7.3.3 Copies of logged communications should be kept by the IPT and their location recorded in the Communications Log.

**8 RECORDS AND PROJECT DOCUMENTATION**

8.1.1 ASEG should ensure that any records and documents produced from following this procedure are stored and maintained.

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9	<p><b>RECOMMENDED TOOLS AND FORMS</b></p> <p>a. <b>Form SSP01b/F/01</b> – Communications Plan</p> <p>b. <b>Form SSP01b/F/02</b> – Communications Log</p>
10	<p><b>GUIDANCE</b></p> <p><b>10.1 General</b></p> <p>10.1.1 General advice on project communication can be found in the ISO 14001 and ISO 14004 Standard, OHSAS 18001 and various sections of JSP418. The BS ISO14063 Environmental Management – Environmental Communication – Guidelines and Examples is also a useful reference.</p> <p>10.1.2 If ASEG already have communications policies, plans or logs then these may be used as an alternative to this procedure so long as ASEG deems them equivalent ie that they meet the same objectives as this procedure.</p> <p>10.1.3 It should be noted that MOD policy encourages regular contact with regulatory authorities, local authorities, and where appropriate, pressure groups and Non Governmental Organisations (NGOs). ASEG will therefore consider communicating the safety and environmental management work being undertaken in DE&amp;S more widely and include this within its communication system where relevant.</p> <p><b>10.2 Warnings and Potential Project Risks</b></p> <p>10.2.1 Communication is an essential part of any Safety or Environmental Management System. If lines of communication are not agreed and documented from the commencement of the project there may be delays and misunderstandings later in the project.</p> <p>10.2.2 Logging and tracking of communications and related responses are necessary to ensure that appropriate information is released or provided to relevant parties in a timely manner, and that significant communications are appropriately authorised.</p>

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<b>MOD</b>	<b>Support Procedures</b>	Procedure SSP01b
<b>SSP01b: Communication - ASEG</b>		Page 6

Form SSP01b/F/01 – Communications Plan							
<b>Completed by:</b>			<b>Date:</b>				
<b>Reviewed by:</b>			<b>Date:</b>				
Ref Stakeholder Register(s) (EMP01/F/01 and SMP01/F/01)	to Stakeholder	Issue/information to be communicated	Frequency of communication	Date for communication	Media to be used	Person responsible	Security issues

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<b>MOD</b>	<b>Support Procedures</b>	Procedure SSP01b
<b>SSP01b: Communication - ASEG</b>		Page 7

Form SSP01b/F/02 – Communications Log								
Date	To	From	Method of communication (letter, fax, email etc)	Subject(s) covered	Person who received enquiry	Person who responded to enquiry	Response date	Documents stored at:

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**0 SHOWING CONFORMANCE**

**0.1 Options**

0.1.1 There are three options to demonstrate conformance when applying this system support procedure:

- a. Follow the defined system support procedure using the recommended guidance and tools, including allowed variations and options.
- b. Use an equivalent process and tool set generated elsewhere and document evidence of procedural equivalence.
- c. Use an equivalent bespoke process and tool set for the project and document evidence of procedural equivalence.

**1 INTRODUCTION**

1.1.1 Effective training and awareness of POSMS and POEMS will be essential to success in managing safety and environmental risks. It is important to ensure that staff are aware of their relevant responsibilities, have the appropriate level of competence and appreciate any impacts potentially caused by the project(s). They must also be aware of how their work may affect safety and environmental risk and the consequences of departure from procedural or operational requirements.

1.1.2 Training will be required at several levels, including:

- General awareness training for all staff whose work may be affected either directly or indirectly by the IPT's SMS and EMS.
- Safety and environment management system training is required for those with direct responsibility for POEMS and POSMS implementation and maintenance;
- Auditor training will be required for individuals involved in auditing the SMS and EMS;
- Other training may be required to ensure project specific environment and safety roles and responsibilities are carried out in accordance with the IPTs SMS and EMS;

1.1.3 The training requirements outlined above should also apply to any contractors or subcontractors where their work may affect safety or environmental management or where they have responsibilities within the SMS and/or EMS.

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<b>2</b>	<p><b>PROCEDURE OBJECTIVES</b></p> <p>2.1.1 To ensure there are documented arrangements for:</p> <ul style="list-style-type: none"> <li>a. Identifying the safety and environmental competency requirements of project staff.</li> <li>b. Assessing project staff competencies against those requirements in order to identify the need for further training;</li> <li>c. Ensuring training needs are met through training delivery;</li> <li>d. Evaluating training effectiveness; and</li> <li>e. Maintaining records of the above.</li> </ul>
<b>3</b>	<p><b>RESPONSIBILITIES</b></p> <p>3.1 <b>Accountability</b></p> <p>3.1.1 Overall responsibility for ensuring this procedure is carried out lies with the IPTL for training relating within the IPT.</p> <p>3.2 <b>Procedure Management</b></p> <p>3.2.1 The IPTL is responsible for the management of this procedure although this may be delegated to a member or members of the IPT. In most cases this will be the Safety and Environment Focal Point.</p> <p>3.3 <b>Procedure Completion</b></p> <p>3.3.1 The IPTL is responsible for the completion of this procedure although this may be delegated to a member or members of the IPT. In most cases this will be the Safety and Environment Focal Point.</p>
<b>4</b>	<p><b>WHEN</b></p> <p>4.1.1 The applicability of this procedure is ongoing from the introduction of the POSMS and POEMS to the end of the project. It also applies when new staff join the IPT or existing staff change roles within the IPT.</p>
<b>5</b>	<p><b>REQUIRED INPUTS</b></p> <ul style="list-style-type: none"> <li>a. <b>EMP01/F/03</b> - Project Environmental Responsibilities Form.</li> <li>b. Project Safety Management Plan (from SMP03).</li> </ul>

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- c. **AAP01a/G/01** – Auditor Competency Interim Guidance;
- d. System Safety and Environmental Functional Competences;
- e. Any existing management arrangements for training IPT staff;
- f. Training records of IPT staff (and contractors/suppliers where applicable);

**6 REQUIRED OUTPUTS**

- a. **SSP02a/F/01** - Training Needs Matrix;
- b. **SSP02a/F/02** – General Awareness Training Declaration Form.

**OR**

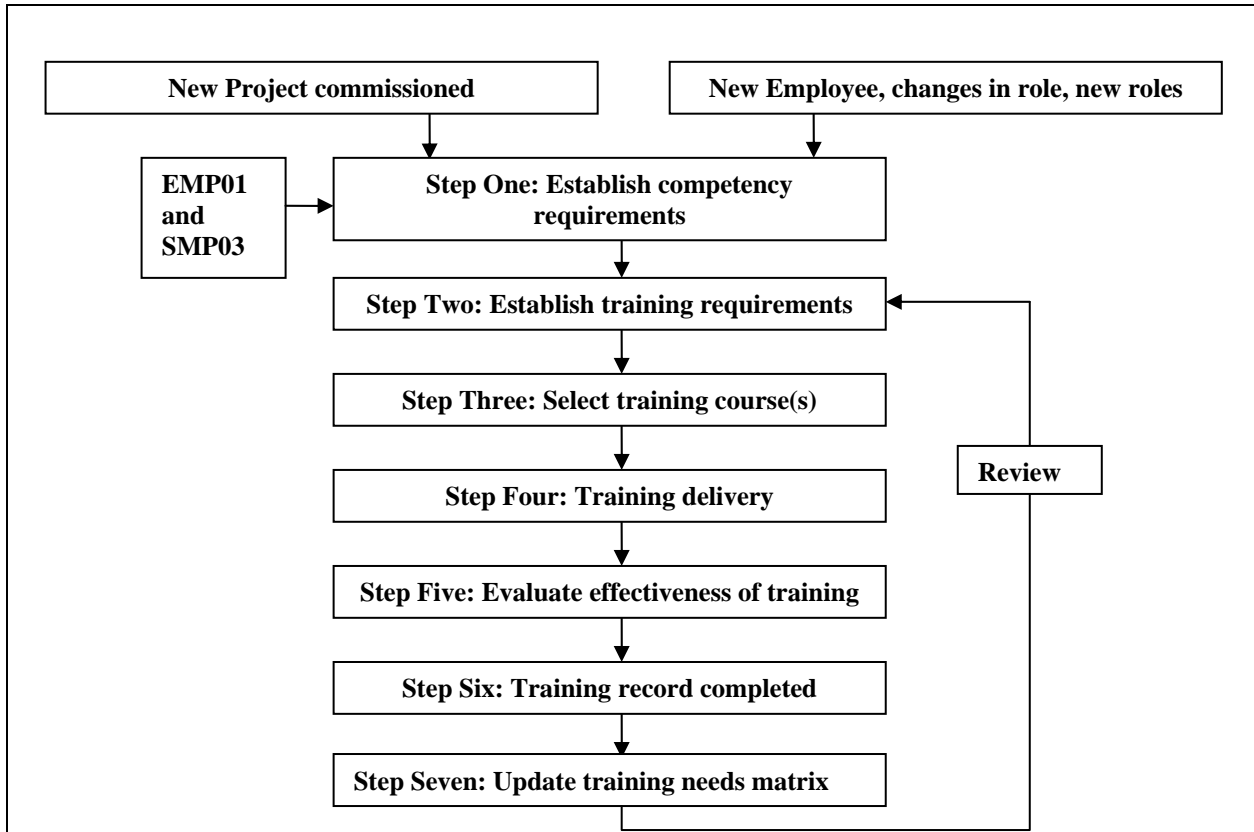
Equivalent actions and documentation that ASEG is satisfied achieve the same objectives.

**7 DESCRIPTION**

**7.1 Introduction**

7.1.1 The diagram below shows the steps described in this section.

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7.1.2 Training is a requirement of any safety and environmental management system and is vital to their successful implementation.

## 7.2 Step One: Establish competency requirements

7.2.1 Before any individual training needs are assessed the IPT needs to match competencies to the various roles and responsibilities within the SMS and EMS. EMS roles and responsibilities should have been recorded in **Form EMP01/F/03** - Project Environmental Responsibilities Form and SMS in the Project Safety Management Plan (from SMP03).

7.2.2 To identify safety competencies the IPT should refer to the Acquisition Functional Competency – System Safety 1 (AFC-SysSaf1) available from <http://defenceintranet.diiweb.r.mil.uk/NR/rdonlyres/6D5AD97F-191A-4662-8D2E-7064626A906F/0/SystemSafetyNov05.doc>. To identify environmental competencies the IPT should refer to the System Environmental Functional Competences, available from <http://defenceintranet.diiweb.r.mil.uk/NR/rdonlyres/DB34105C-77F6-43E6-B4FE-73888CEAB104/0/SystemEnvironmentalFC.doc>. At the time of writing there were no equivalent documents for auditor competencies, therefore, as an interim measure AAP01/G/01 – Auditor Competency Interim Guidance can be used.

## 7.3 Step Two: Establish training requirements

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- 7.3.1 Once the roles and responsibilities within the SMS and EMS have been matched to the appropriate competency area and, where applicable, the level the IPT needs to compare these with the current competency of the staff members fulfilling those roles. When assessing an individual's competency, previous training or experience should be considered. This can include work experience and on-the-job training. Where the staff member does not meet the competency level required for their role a training need is identified.
- 7.3.2 **Form SSP02a/F/01** – Training Needs Matrix can be used to record required competencies and actual competency for staff members, thereby showing any training needs. The IPT can record safety and environmental training needs within the same matrix or separately as desired.
- 7.3.3 In addition to identifying competency 'areas' the matrix can be used to show the competency 'level' required by inserting the level number (taken from the competency guidance documents) in the appropriate box. It should be noted however, that not all competency areas have levels eg general awareness training.

**Step Three: Select Training Course(s)**

- 7.3.4 Once training needs have been identified, the IPT needs to find appropriate training courses to bring individual's competency up to the required level. For general awareness the IPT may decide to use its own staff to deliver training but the majority of training will be delivered by external parties eg RAF Halton and the Royal Military College of Science and Defence Academy of the UK, Shrivenham. A register of courses recognised as addressing core competencies should be available from ASEG.
- 7.3.5 In order to match an individual's needs with the training, it is important to find out when and where courses are being held in addition to their content. IPTs should note that courses can be delivered via software packages in addition to more traditional methods.

**7.4 Step Four: Training delivery**

- 7.4.1 Training delivery can take place once the training package has been selected and agreed with the individual concerned.

**7.5 Step Five: Evaluate training effectiveness**

- 7.5.1 On completion of the training its effectiveness should be evaluated. For general awareness training this could be via a simple questionnaire or brief interview with the individual to establish whether awareness has improved. For more specialised training the IPT may confirm effectiveness if:
  - The training was delivered via an accredited or recognised course; or
  - The trainee successfully passed the end of course assessment or test (where

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<p>applicable).</p> <p><b>7.6 Step Six: Complete training record</b></p> <p>7.6.1 For general awareness training the individual should use Form <b>SSP02a/F/02</b> – General Awareness Training Declaration Form to confirm to the IPT that the training has been delivered. These forms should be stored by the IPT for future reference. For more formal courses, records of attendance may be used to confirm delivery. Once confirmed the individual’s training record should be updated.</p> <p><b>7.7 Step Seven: Update training needs matrix</b></p> <p>7.7.1 The training needs matrix (<b>Form SSP02a/F/01</b>) should be updated to show that training has been completed.</p>
<p><b>8 RECORDS AND PROJECT DOCUMENTATION</b></p> <p>8.1.1 Where relevant, the outputs from this procedure should feed into the following:</p> <p style="margin-left: 20px;">a. Individual training records.</p> <p>8.1.2 A copy of the Training Needs Matrix (<b>Form SSP02a/F/01</b>) produced by following this procedure should be stored in the Project Environmental Case.</p>
<p><b>9 RECOMMENDED TOOLS AND FORMS</b></p> <p style="margin-left: 20px;">a. <b>SSP02a/F/01</b> - Training Needs Matrix;</p> <p style="margin-left: 20px;">b. <b>SSP02a/F/02</b> - General Awareness Training Declaration Form.</p>
<p><b>10 GUIDANCE</b></p> <p><b>10.1 General</b></p> <p>10.1.1 General advice on competence, awareness and training can be found in ISO 14001 Standard, OHSAS 18001 and various sections of JSP418.</p> <p>10.1.2 If a project management system (ISO 9000 or otherwise) is already in place for the project which covers training activities, the IPT can use these in place of this procedure so long as ASEG is satisfied they meet the same objectives.</p> <p>10.1.3 Where there is no formalised project management system or no pre-existing arrangements for competence, awareness and training, then the IPT should follow this procedure to manage training arrangements.</p>

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## 10.2 Training on POSMS and POEMS systems General Awareness Training

10.2.1 All staff whose work may affect the safety or environmental impacts of the equipment or have roles or responsibilities within POSMS and POEMS, including contractors and suppliers, should receive general awareness training.

10.2.2 General awareness training should include:

- a. An introduction to safety and environmental issues.
- b. An introduction to POSMS and POEMS and the IPT's SMS and EMS.
- c. The importance of conformity with POSMS and POEMS requirements;
- d. Any safety and environment requirements that affect staff's day to day work;
- e. The priority environmental impacts and safety risks associated with their work;
- f. Their roles and responsibilities in achieving conformity;
- g. Applicable environmental and safety legal and non legal requirements;
- h. Improvement and mitigation measures (planned or current);
- i. Location of relevant documentation;
- j. How to report accidents and incidents;
- k. Requirements of the MOD Environmental Policy;
- l. Project safety and environment policy (where it exists);
- m. Points of contact within the IPT for safety and environmental issues.

10.2.3 The Green Book and White Book may be used for raising general awareness.

## 10.3 Internal Auditor Training

10.3.1 **Form AAP01a/G/01** outlines three competency levels for system auditing as follows:

- Lead Auditor.
- Auditor.
- Aspirant Auditor.

10.3.2 Internal auditor training should be delivered by staff at Lead Auditor level that have experience of auditing SMSs and EMSs.

## 10.4 POEMS and POSMS Implementation and Operation Training

10.4.1 This training will be required by any staff members (including contractors and

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suppliers) who have roles or responsibilities within the IPT's SMS and EMS.

**10.5 Other training requirements**

10.5.1 Other safety and environment training may be required in the operation of the IPT's Safety and Environment Management System(s), for example specialised safety training for OME projects.

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<b>MOD</b>	<b>Support Procedures</b>	Procedure SSP02a
<b>SSP02a: Training and Awareness – IPTs</b>		Page 9

Form SSP02a/F/01 – Training Needs Matrix												
Name	Position	Role or responsibility within POEMS	POEMS and POSMS Awareness		Auditor skills		EMS Implementation and Management		SMS Implementation and Management		Other E.g. specific technical knowledge	
			Required	Actual	Required	Actual	Required	Actual	Required	Actual	Required	Actual

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<b>MOD</b>	<b>Support Procedures</b>	Procedure SSP02a
<b>SSP02a: Training and Awareness – IPTs</b>		Page 10

<b>SSP02a/F/02 – General Awareness Training Declaration Form</b>	
<b>Name:</b>	
<b>Responsibilities:</b>	
<b>Project:</b>	
<b>Date of Training:</b>	
<b>I confirm that I have received and understood the General Awareness Training for POEMS and POSMS</b>	..... <i>Signature</i>
<b>Comments</b>	

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<b>MOD</b>	<b>Support Procedures</b>	Procedure SSP02a
<b>SSP02a: Training and Awareness – IPTs</b>		Page 2

<b>Name:</b>	
<b>Responsibilities:</b>	
<b>Project:</b>	
<b>Date of Training:</b>	
<b>I confirm that I have received and understood the General Awareness Training for POEMS and POSMS</b>	..... <i>Signature</i>
<b>Comments</b>	

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MOD	Support Procedures	Procedure SSP02a Page 1
SSP02a: Training and Awareness – IPTs		

SSP02a/G/01 – Environmental Competency Interim Guidance	
<p>There are 3 levels of competency in environmental management described in this guidance, these being:</p> <ul style="list-style-type: none"> <li>• <b>Supervised Practitioner</b> – Has knowledge of and can apply environmental management processes, under supervision.</li> <li>• <b>Practitioner</b> – Has knowledge of and can apply environmental management processes, unsupervised.</li> <li>• <b>Expert</b> – Has knowledge of, can apply and supervise environmental management processes.</li> </ul>	
General attributes of all practitioners:	
<b>Knowledge and skills:</b>	<p><b>All staff with environmental management responsibilities within POEMS should be able to:</b></p> <ul style="list-style-type: none"> <li>• Understand and implement national and international environmental legislation and standards.</li> <li>• Understand and be aware of MOD environmental requirements, procedures and regulations.</li> <li>• Develop and maintain an internal Environmental Management System, eg based on POEMS.</li> <li>• Understand system standards.</li> <li>• Understand relevant environmental terminology.</li> <li>• Understand environmental management principles.</li> <li>• Understand relevant environmental management tools.</li> <li>• Monitor and assess the environmental performance of a contractor and determine their ability to meet contractual environmental requirements.</li> <li>• Valuate environmental issues and make sound decisions accordingly.</li> <li>• Understand the purpose of environmental planning and to specify the requirement for and evaluate environmental plans.</li> <li>• Determine and apply appropriate environmental standards throughout the life cycle phases for products (hardware, software, processed materials and services).</li> <li>• Understand a range of operational environmental tools and techniques and be able to apply them in an appropriate manner.</li> <li>• Understand the requirements of Environmental Management Systems (eg ISO 14001) and their application by contractors.</li> <li>• Carry out planned audit, assessment, evaluation and verification activities on equipment and systems, including where appropriate, of contractor’s Environmental Management Systems.</li> <li>• Carry out planned review and reporting activities.</li> <li>• Monitor contractors’ corrective actions and modify surveillance activities accordingly.</li> <li>• Apply the requirements for through life environmental management and the need for continuous improvement to the EMS.</li> </ul>

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MOD SSP02a: Training and Awareness – IPTs	Support Procedures	Procedure SSP02a Page 2
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	<ul style="list-style-type: none"> <li>Achieve environmental assurance through monitoring and audits.</li> <li>Understand the roles and functions for the various organisations that make up the environmental committee.</li> <li>Contribute to the production of the environmental case.</li> <li>Understand the requirement and applicability of certification and approvals.</li> <li>Maintain confidentiality.</li> </ul>
<b>Supervised Practitioner</b>	
<b>Competency and experience:</b>	<p>Initially the most important areas of experience and competence are the attributes outlined in the General Attributes section above. However, in addition supervised practitioners should –</p> <ul style="list-style-type: none"> <li>Have some knowledge of environmental management processes.</li> <li>Be proficient at effectively utilising their time.</li> <li>Provide assistance to Experts and Practitioners where required.</li> <li>Help with the preparation and production of any documentation.</li> <li>Have knowledge of ASEMS, POEMS and POSMS.</li> </ul>
<b>Practitioner</b>	
<b>Competency and experience:</b>	<p>The candidate is expected to –</p> <ul style="list-style-type: none"> <li>Have successfully completed an accredited Environmental Management course (eg ISO 14001) or have equivalent practical training and experience.</li> <li>Have EMS experience, gained under the direction and guidance of an Expert who meets all of the above requirements.</li> <li>Have gained experience in the entire EMS process by participating in a minimum of two EMSs including undertaking document review and reporting.</li> <li>Can identify areas of risk (eg through EIA) and develop procedures to mitigate these risks.</li> <li>Be proficient at effectively utilising their time.</li> <li>Provide assistance to supervised practitioners.</li> <li>Help with the preparation and production of any documentation.</li> <li>Have knowledge of ASEMS, POEMS and POSMS.</li> </ul>
<b>Expert</b>	
<b>Competency and experience:</b>	<p>The candidate is expected to –</p> <ul style="list-style-type: none"> <li>Have successfully completed an accredited Environmental Management course (eg ISO 14001) or have equivalent practical training and experience.</li> <li>Have acted as a qualified Expert for at least two completed EMSs.</li> <li>Have a minimum of four years full-time appropriate practical workplace experience (not including training).</li> <li>Be able to undertake evaluation and review activities, to verify achievement of required performance, including agreed environmental characteristics, and</li> </ul>

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MOD Support Procedures SSP02a: Training and Awareness – IPTs	Procedure SSP02a Page 3
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	<p>acceptance criteria.</p> <ul style="list-style-type: none"> <li>Be able to develop and maintain an Environmental Management Programme.</li> <li>Advise on and interpret environmental requirements with sufficient breadth of experience, knowledge and depth of understanding, to be able to apply necessary requirements when applicable.</li> <li>Identify areas of risk (eg through EIA) and advise how environmental management can be used to mitigate these risks.</li> <li>Generate an effective environmental management strategy and plan, based on the identified environmental management requirements of the equipment or technologies.</li> <li>Be proficient at planning and effectively utilising resources.</li> <li>Organise and direct other team members.</li> <li>Provide guidance and assistance to supervised practitioner.</li> <li>Lead the team in completing the EMS or specified sections.</li> <li>Prepare, complete and review EMS output documentation.</li> <li>Have knowledge of ASEMS, POEMS and POSMS.</li> </ul>
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<b>0</b>	<b>SHOWING CONFORMANCE</b>
<b>0.1</b>	<b>Options</b>
<b>0.1.1</b>	There are three options to demonstrate conformance when applying this system support procedure: <ul style="list-style-type: none"> <li>a. Follow the defined system support procedure using the recommended guidance and tools, including allowed variations and options.</li> <li>b. Use an equivalent process and tool set generated elsewhere and document evidence of procedural equivalence.</li> <li>c. Use an equivalent bespoke process and tool set for the project and document evidence of procedural equivalence.</li> </ul>
<b>1</b>	<b>INTRODUCTION</b>
<b>1.1</b>	<b>Assisting IPTs</b>
<b>1.1.1</b>	ASEG has two main responsibilities relating to assisting IPTs: <ul style="list-style-type: none"> <li>• To make available to IPT staff, a register of appropriate training courses for safety and environmental competence (see para 10.1.4); and</li> <li>• To develop and circulate guidance on safety and environmental issues and POSMS and POEMS implementation.</li> </ul>
<b>1.2</b>	<b>ASEG Training</b>
<b>1.2.1</b>	ASEG staff may be called upon by IPTs to provide advice and guidance on how to implement POSMS and POEMS. In some circumstances they may be called upon to develop training materials on POSMS and POEMS and may be required to perform auditing roles. It is therefore important that ASEG staff have a thorough knowledge of both systems, practical knowledge on how they can be implemented at an IPT or project level and how to perform audits.
<b>1.2.2</b>	Within ASEG there will be a need for the following competencies: <ul style="list-style-type: none"> <li>• In-depth knowledge of POSMS and POEMS;</li> <li>• Advanced knowledge of environmental and safety issues;</li> <li>• Auditing skills.</li> </ul>
<b>2</b>	<b>PROCEDURE OBJECTIVES</b>
<b>2.1.1</b>	The main objectives of this procedure are for ASEG to:

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- a. Establish arrangements for providing training guidance to IPT staff on safety and environmental issues and implementation of POSMS and POEMS.
- b. Establish documented arrangements within ASEG for:
  - Identifying the safety and environmental competency requirements of ASEG staff;
  - Assessing staff competencies against those requirements in order to identify the need for further training;
  - Ensuring training needs are met through training delivery;
  - Evaluating training effectiveness; and
  - Maintaining records of the above.

**3 RESPONSIBILITIES**

**3.1 Accountability**

3.1.1 ASEG is accountable for the completion of this procedure.

**3.2 Procedure Management**

3.2.1 ASEG is responsible for the management of this procedure although this may be delegated to a member or members of ASEG.

**3.3 Procedure Completion**

3.3.1 ASEG is responsible for the completion of this procedure although this may be delegated to a member or members of ASEG.

**4 WHEN**

4.1.1 The applicability of this procedure is ongoing from the introduction of the POSMS and POEMS.

**5 REQUIRED INPUTS**

a. Any existing arrangements or agreements relating to ASEG’s role in providing guidance to IPTs.

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- b. Existing arrangements for training of ASEG staff.
- c. Any existing training records for ASEG staff.

**6 REQUIRED OUTPUTS**

a. **SSP02b/F/01** - Training Needs Matrix;

**OR**

Equivalent actions and documentation that ASEG is satisfied achieve the same objectives.

**7 DESCRIPTION**

**Assisting IPTs**

**7.1 Step One: Develop and maintain a register of training courses**

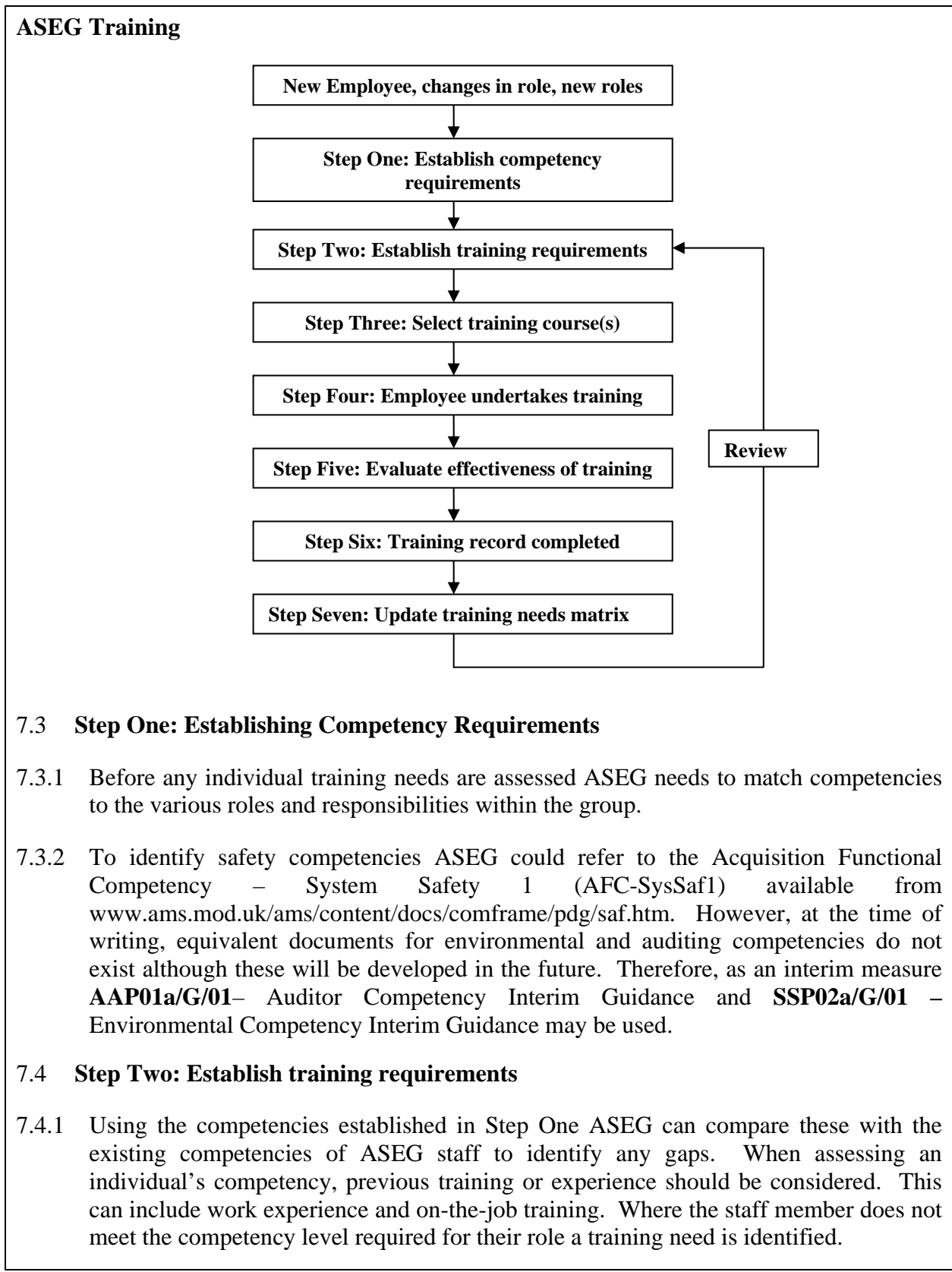
7.1.1 In order for IPTs to select suitable training courses to address the training needs of their staff they will need access to a list or register of safety and environmental courses. This register should include details of the training body delivering each course, the competency level achieved by completing each course. Where possible the register should also include details of dates, locations and cost of the training courses. ASEG should develop such a register of courses that address the following competencies:

- POEMS and POSMS;
- Safety and environmental issues;
- ISO14001 and OHSAS18001;
- Auditing skills.

**7.2 Step Two: Develop and maintain advice and guidance for IPTs**

7.2.1 In its IPT guidance role ASEG should develop and maintain advice and guidance on safety and environmental issues, POEMS and POSMS. This includes publications such as the Green Book and White Book and the AMS website. It may also include provision of training on POSMS and POEMS or related issues.

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**7.3 Step One: Establishing Competency Requirements**

- 7.3.1 Before any individual training needs are assessed ASEG needs to match competencies to the various roles and responsibilities within the group.
- 7.3.2 To identify safety competencies ASEG could refer to the Acquisition Functional Competency – System Safety 1 (AFC-SysSaf1) available from [www.ams.mod.uk/ams/content/docs/comframe/pdg/saf.htm](http://www.ams.mod.uk/ams/content/docs/comframe/pdg/saf.htm). However, at the time of writing, equivalent documents for environmental and auditing competencies do not exist although these will be developed in the future. Therefore, as an interim measure **AAP01a/G/01**– Auditor Competency Interim Guidance and **SSP02a/G/01** – Environmental Competency Interim Guidance may be used.

**7.4 Step Two: Establish training requirements**

- 7.4.1 Using the competencies established in Step One ASEG can compare these with the existing competencies of ASEG staff to identify any gaps. When assessing an individual’s competency, previous training or experience should be considered. This can include work experience and on-the-job training. Where the staff member does not meet the competency level required for their role a training need is identified.

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7.4.2 Form **SSP02b/F/01** – Training Needs Matrix can be used to record required competencies and actual competency for staff members, thereby showing any training needs. ASEG can record safety and environmental training needs within the same matrix or separately as desired.

7.4.3 In addition to identifying competency ‘areas’ the matrix can be used to show the competency ‘level’ required by inserting the level number (taken from the competency guidance documents) in the appropriate box. It should be noted however, that not all competency areas have levels eg general awareness training.

**7.5 Step Three: Select training courses**

7.5.1 Once the training gaps have been identified ASEG needs to identify courses or workshops to provide the necessary training to the required level of competency.

**7.6 Step Four: Training delivery**

7.6.1 Training delivery can take place once the training package has been selected and agreed with the individual concerned.

**7.7 Step Five – Evaluate training effectiveness**

7.7.1 Once the individual has completed the training, the effectiveness of the training should be evaluated. ASEG may confirm the effectiveness of the training if:

- The training was delivered via an accredited or recognised course; or
- The trainee successfully passed the end of course assessment or test (where applicable).

**7.8 Step Six – Complete Training Record**

7.8.1 When ASEG is satisfied that the training has been delivered and was effective the individual’s training record should be updated.

**7.9 Step Seven: Update training needs matrix**

7.9.1 The training needs matrix should be updated to show that the training has been completed.

**8 RECORDS AND DOCUMENTATION**

8.1.1 The outputs from this procedure should be stored and maintained by ASEG according to existing document control arrangements.

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9	<p><b>RECOMMENDED TOOLS AND FORMS</b></p> <p>a. <b>Form SSP02b/F/01</b> - Training Needs Matrix</p>
10	<p><b>GUIDANCE</b></p> <p><b>10.1 General</b></p> <p>10.1.1 General advice on competence, awareness and training can be found in ISO 14001 Standard, OHSAS 18001 and various sections of JSP418.</p> <p>10.1.2 If ASEG already has designated responsibilities and arrangements for providing guidance to IPTs with regard to safety and environmental issues and POSMS and POEMS implementation these may be used as alternatives to the IPT guidance elements of this procedure.</p> <p>10.1.3 If ASEG already has systems or procedures for training of staff these may be used as alternatives to the training elements of procedure so long as they meet the same objectives.</p> <p>10.1.4 At the time of writing the MOD is in the process of defining functional competencies for environmental management and sustainable development so ASEG may not be able to completely fulfil their responsibility to provide IPTs with training courses matched against competency levels until these have been produced.</p> <p><b>10.2 Training Courses</b></p> <p>10.2.1 The civil service college operates a number of environmental and safety training courses, including IOSH and Internal Auditor Training.</p> <p>10.2.2 The Specialist Management Training Wing at RAF Halton operates a number of courses, some of which are specific to EMS and ISO14001.</p>

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<b>SSP02b: Training and Awareness – ASEG</b>		Page 7

Form SSP02b/F/01 – Training Needs Matrix												
Name	Position	Role or responsibility	POEMS and POSMS Awareness		Auditor skills		EMS Implementation and Management		SMS Implementation and Management		Other eg specific technical knowledge	
			Required	Actual	Required	Actual	Required	Actual	Required	Actual	Required	Actual

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**0 SHOWING CONFORMANCE**

**0.1 Options**

0.1.1 There are three options to demonstrate conformance when applying this system procedure:

- a. Follow the defined system procedure using the recommended guidance and tools, including allowed variations and options;
- b. Use an equivalent process and tool set generated elsewhere and document evidence of procedural equivalence;
- c. Use an equivalent bespoke process and tool set for the project and document evidence of procedural equivalence.

**1 INTRODUCTION**

1.1.1 The POSMS and POEMS are frameworks for delivering project level management systems and continuous improvement in safety and environmental performance. Rigorous and careful control of documents and storage of records is key to developing a successful management system.

1.1.2 Within this procedure the following definitions are used:

- Document – Any information produced as outputs of POSMS and POEMS procedures, in any medium eg paper, electronic, photographic.
- Record – Any document that states results achieved or provides evidence of activities performed. At an IPT level this may include monitoring results, audit records etc.

1.1.3 Many documents will require review and update throughout the lifetime of the project and are likely to move through several reviewed versions during the life of the system eg Register of Environmental Standards. However, records are static and fixed in time. Records are not revised and updated eg waste management licences, monitoring results.

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**2 PROCEDURE OBJECTIVES**

**2.1 Documents**

2.1.1 Documented arrangements are in place to ensure that all documents produced within the project level SMS or EMS (eg Register of Standards, Register of Stakeholders):

- a. Are approved for adequacy prior to issue;
- b. Are reviewed and updated as necessary;
- c. Are identifiable by date, version number and (where applicable) revision status;
- d. Are available in their current version at locations where operations essential to the effective functioning of POSMS and POEMS are performed.

**2.2 Records**

2.2.1 Documented arrangements are in place to ensure:

- a. All records associated with POSMS and POEMS eg monitoring results or licences, are established, maintained and disposed of when required.
- b. To ensure that records are identifiable, legible and traceable and are stored and maintained in such a way that they are readily retrievable and protected against damage, deterioration and loss.
- c. To establish retention times for records.

**3 RESPONSIBILITIES**

**3.1 Accountability**

3.1.1 The IPTL is accountable for the completion of this procedure.

**3.2 Procedure Management**

3.2.1 The IPTLs may delegate the management of this procedure to the Environmental Focal Point.

**3.3 Procedure Completion**

3.3.1 IPTs will be responsible for completing the procedure.

**4 WHEN**

4.1.1 Regarding document control, the applicability of this procedure is ongoing from the production of POSMS and POEMS outputs.

4.1.2 For project records this procedure is applicable throughout the duration of any project and afterwards if a need is identified for project records being retained after the

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project's conclusion.

- 5 REQUIRED INPUTS**
- a. Documents – Any information produced as outputs of POEMS and POSMS in any media eg paper, electronic, photographic.
  - b. Records – Any document that states results achieved or provides evidence of activities performed (eg monitoring results, audit record etc).
  - c. Any existing document or record control arrangements within the IPT.

- 6 REQUIRED OUTPUTS**
- a. Appropriately controlled documents (**Form SSP03a/F/01** – Document Log);
  - b. Appropriately managed records (**Form SSP03a/F/02** – Record Log);
  - c. **SSP03a/F/03** - Document Change Request Form.
- OR**
- Equivalent actions and documentation that ASEG is satisfied achieve the same objectives.

**7 DESCRIPTION**

**Document Control**

```

graph TD
    A[Create/review document] --> B[Gain approval]
    B --> C[Remove obsolete versions]
    C --> D[Release new version]
    D --> E[Update Document Log]
    F[Request for change] --> G[Review]
    G --> A
    G --> C
  
```

7.1.1 POSMS and POEMS procedures require that most project level outputs are documented. Many of these documents will need review and revision throughout the lifetime of the project.

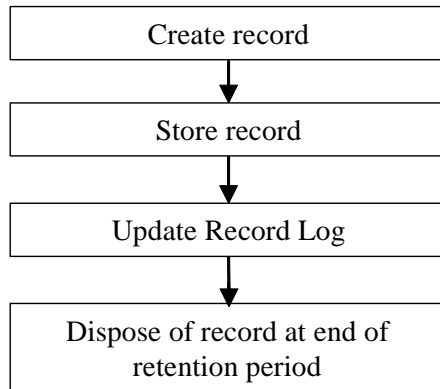
7.1.2 The IPT should ensure that all POSMS and POEMS documents are legible, show their title, the date they were created, the version number, the person responsible for their maintenance and revision and the person responsible for their approval.

7.1.3 In addition, documents should be logged to ensure that the most up to date versions are

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available and that these are easily located. **Form SSP03a/F/01** – Document Log can be used to record this information.

**Record Control**



7.1.4 The IPT is responsible for ensuring that records required in relation to proving compliance with the POSMS and POEMS requirements are established, maintained and disposed of when no longer required.

7.1.5 Records include the following:

- Reports/studies completed (ie EIA Reports, SCRs etc.);
- Waste Management Licences
- Other supporting records produced in relation to the project POSMS and POEMS.

7.1.6 Records should be legible, identifiable and traceable. This can be accomplished through ensuring that they include a title, the date they were created and the person responsible for their storage and maintenance.

7.1.7 All safety and environmental records, unless otherwise required, should be retained for the lifetime of the project. The IPT should identify where records may be required to be stored for longer or shorter.

7.1.8 A log of all records produced by following the POSMS and POEMS procedures should be created and maintained. This should include information on who is responsible for maintaining/storing the record and the retention time. **Form SSP03a/F/02** – Record Log can be used to record this information.

**Requesting a change to POSMS, POEMS and IPT documents**

7.1.9 It is a central objective of any SMS or EMS for the system to continually improve. IPTs, as users of the POSMS and POEMS, have a responsibility to contribute to their continual improvement through the submission of suggestions and recommendations for change.

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7.1.10 IPTs can request amendments to POSMS and POEMS by submitting a completed **Form SSP03a/F/03** – Document Change Request Form to ASEG for consideration.

7.1.11 This form may also be used within or between IPTs to request changes to IPT level documentation eg Register of Stakeholder Requirements and Information. If such a request is made within an IPT the recipient of the form (usually the Safety and Environmental Focal Point) is responsible for completing the second half of the form. Before deciding whether to make an amendment, the recipient of the form may consult with other parties eg Subject Matter Expert, ASEG, Safety or Environmental Committee. Any consultees involved in the process should be documented on the form.

**8 RECORDS AND PROJECT DOCUMENTATION**

8.1.1 Not applicable.

- 9 RECOMMENDED TOOLS AND FORMS**
- a. **SSP03a/F/01** – Document Log
  - b. **SSP03a/F/02** – Record Log
  - c. **SSP03a/F/03** – Document Change Request Form

**10 GUIDANCE**

**10.1 General**

10.1.1 General advice on document control and record keeping procedures can be found in the ISO 14001, ISO 14004, OHSAS 18001 and various sections of JSP418.

10.1.2 If a project management system (ISO 9000 or otherwise) is already in place for the project which includes document control and/or record keeping, the IPT should follow these requirements or procedures as an alternative to this procedure, so long as ASEG is satisfied they meet the same objectives.

10.1.3 Where there is no formalised project management system or no pre-existing arrangements for record keeping, then the IPT should follow this procedure to establish appropriate record keeping arrangements.

10.1.4 In some cases, records will be produced by equipment or service suppliers or advisors. Where this is the case the records may be maintained by other parties however the IPT should have relevant information to demonstrate conformance with the objectives of this procedure.

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**10.2 Warnings and Potential Project Risks**

10.2.1 Failure in producing and maintaining appropriate documents and records could cause problems for the IPT and other stakeholders in managing safety and environmental issues or proving that safety and environmental issues have been appropriately managed. This could result in financial costs in terms of reproducing documents/studies or even prosecution.

**10.3 Record Retention**

10.3.1 IPTs should be aware that there may be legal or other requirements for records to be retained for specific lengths of time eg for health monitoring, asbestos or commercial records. Advice should be sought from subject matter experts on the specific requirements.

10.3.2 Further guidance is available from the National Archives at [http://www.nationalarchives.gov.uk/documents/sched\\_health\\_safety.pdf](http://www.nationalarchives.gov.uk/documents/sched_health_safety.pdf)

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Form SSP03a/F/01 – Document Log						
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<b>MOD</b>	<b>Support Procedures</b>	Procedure SSP03a
<b>SSP03a: Document and Record Control – IPTs</b>		Page 8

Form SSP03a/F/02 – Record Log					
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SSP03a/F/03 – Document Change Request Form	
<b>Title of Document:</b>	
<b>Reference Number:</b>	
<b>Nature of Change Requested:</b>	
<b>Reason(s) for change:</b>	
<b>Contact Details for Person Requesting Change:</b>	
<b>Date of Request:</b>	
Following to be completed by Recipient	
<b>Received by:</b>	
<b>Consultees (where applicable)<sup>1</sup>:</b>	
<b>Outcome of Request (please circle):</b>	Approved:          Approved (with amendments):          Rejected: Date:
<b>Reason for Rejection (if applicable)</b>	
<b>Other notes</b>	
<b>Forwarded for Action:</b>	To: Date:
<b>Change Completed:</b>	Date:

<sup>1</sup> Where the request involves a major change to POSMS or POEMS, ASEG must be consulted.

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0	<b>SHOWING CONFORMANCE</b>	0.1 <b>Options</b>  0.1.1 There are three options to demonstrate conformance when applying this system procedure: <ol style="list-style-type: none"> <li>a. Follow the defined system procedure using the recommended guidance and tools, including allowed variations and options;</li> <li>b. Use an equivalent process and tool set generated elsewhere and document evidence of procedural equivalence;</li> <li>c. Use an equivalent bespoke process and tool set for the project and document evidence of procedural equivalence.</li> </ol>
1	<b>INTRODUCTION</b>	1.1.1 The POSMS and POEMS are frameworks for delivering continuous improvement in safety and environmental performance. Rigorous and careful control of documents and storage of records is key to developing a successful management system.  1.1.2 Within this procedure the following definitions are used: <ul style="list-style-type: none"> <li>• Document – For ASEG this term primarily refers to the POSMS and POEMS Manuals including procedures, tools and guidance;</li> <li>• Record – This is a document that states results achieved or provides evidence of activities performed. For ASEG this can include copies of summary audit reports, ASEG staff training records, copies of communications relating to POSMS and POEMS.</li> </ul>

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**2 PROCEDURE OBJECTIVES**

**2.1 Documents**

2.1.1 Documented arrangements are in place to ensure that all POSMS and POEMS documents (ie the manuals, procedures, tools and guidance):

- a. Are approved for adequacy prior to issue;
- b. Are reviewed and updated as necessary;
- c. Are identifiable by date, version number and (where applicable) revision status;
- d. Are available in their current version at locations accessible by IPTs and interested third parties.

**2.2 Records**

2.2.1 Documented arrangements are in place to ensure:

- a. All records associated with POSMS and POEMS eg summary audit reports, are established, maintained and disposed of when required.
- b. To ensure that records are identifiable, legible and traceable and are stored and maintained in such a way that they are readily retrievable and protected against damage, deterioration and loss.
- c. To establish retention times for records.

**3 RESPONSIBILITIES**

**3.1 Accountability**

3.1.1 ASEG is accountable for the completion of this procedure in regards to documents.

**3.2 Procedure Management**

3.2.1 ASEG will manage the procedure in regards to controlling documents.

**3.3 Procedure Completion**

3.3.1 ASEG will follow the procedure in regards to controlling documents.

3.3.2 Anyone who uses, refers to or has an informed opinion on the POSMS and POEMS can request a change to POSMS and POEMS documents (**Form SSP03a/F/03** can be used for this purpose).

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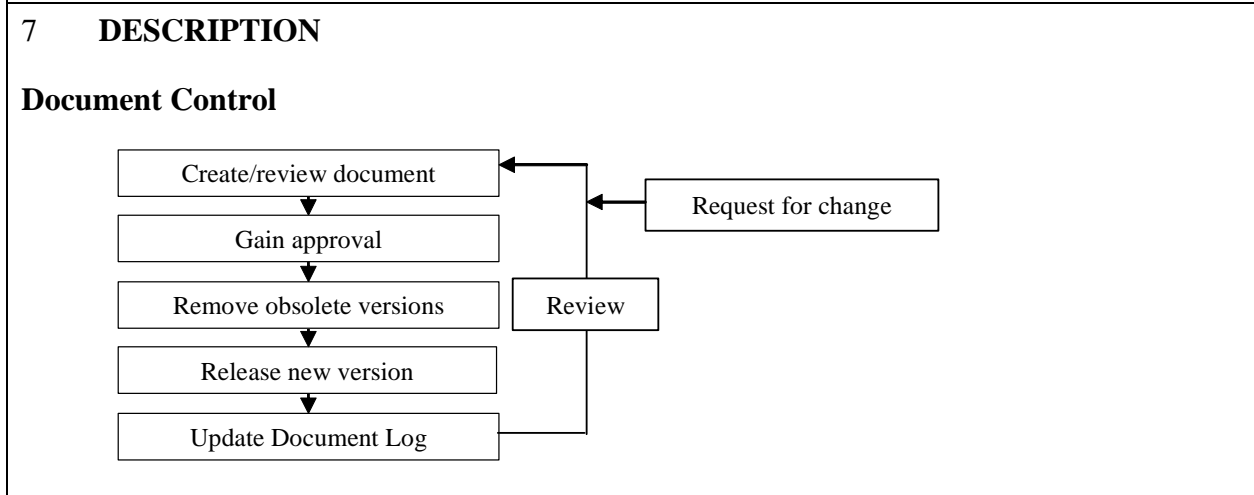
**4 WHEN**

4.1.1 Regarding document control, the applicability of this procedure is ongoing from the first publication of the POSMS and POEMS Manuals until they are withdrawn from use.

4.1.2 For records required by ASEG e.g. summary audit reports, this procedure is applicable from the first publication of the POSMS and POEMS Manuals until they are withdrawn from use, and afterwards if a need is identified for records to be retained.

- 5 REQUIRED INPUTS**
- a. Documents – All POSMS and POEMS manuals, procedures, tools and guidance.
  - b. Records – All ASEG records relating to POSMS and POEMS eg summary audit reports, ASEG staff training records.
  - c. Any requests received by ASEG for changes to POSMS or POEMS documents (**Form SSP03a/F/03 – Document Change Request Form**).
  - d. Any existing document or record control arrangements within ASEG.

- 6 REQUIRED OUTPUTS**
- a. Appropriately controlled documents (**Form SSP03b/F/01 – Document Log**);
  - b. Appropriately managed records (**Form SSP03b/F/02 – Record Log**);
- OR**
- Equivalent actions and documentation that ASEG is satisfied achieve the same objectives.

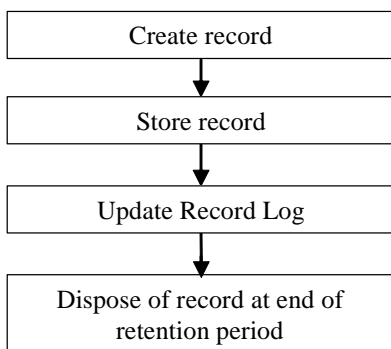


7.1.1 The master copies of the POSMS and POEMS documents will be held by ASEG and should be individually identified through the inclusion of: title, date of issue, revision

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- number, name of the issuer and approver. ASEG should ensure that any new versions of documents are approved prior to use.
- 7.1.2 Controlled copies of the POSMS and POEMS documents should be made available to all IPTs. Uncontrolled copies may be distributed to any interested personnel. All uncontrolled copies should be identified as such.
  - 7.1.3 Requests for amendments to POSMS and POEMS documents may be made by IPT staff by submitting a completed **Form SSP03a/F/01** – Document Change Request Form to ASEG for consideration.
  - 7.1.4 The recipient of the form is responsible for completing the second half of the form. On receipt of the form, ASEG should consider any suggested changes and if appropriate make those changes. ASEG may consult with other parties before deciding whether to make an amendment. If this is the case then the consultee(s) should be documented in the form. Any changes must then be communicated to the acquisition community. Implementation of suggested changes may be saved until a planned update of POSMS or POEMS to avoid frequent re-issues of the manuals. Any changes made to POSMS and POEMS documents should be authorised by ASEG.
  - 7.1.5 Obsolete versions should be destroyed if no longer deemed useful or, if retained, identified as obsolete.
  - 7.1.6 A log of all POSMS and POEMS documents that are the responsibility of ASEG (including the Manuals, procedures, tools and guidance) should be created and maintained. This log should show who is responsible for their maintenance and where the master copies of the documents are located. **Form SSP03b/F/01** – Document Log can be used for this purpose.
  - 7.1.7 Archival documents and data retained for legal and/or knowledge preservation purposes, should also be suitably identified and logged.

**Record Control**



- 7.1.8 ASEG is responsible for maintaining records associated with POEMS and POSMS.
- 7.1.9 These may include the following:

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- Summary audit reports;
  - Communications received or dispatched;
  - ASEG staff training records.
- 7.1.10 Records should be legible, identifiable and traceable. This can be accomplished through ensuring that they include a title, the date they were created and the person responsible for their storage and maintenance. They should be stored in such a way that they are readily retrievable and protected against damage, deterioration or loss.
- 7.1.11 A log of all ASEG’s records relating to POSMS and POEMS should be created and maintained. This should include information on who is responsible for maintaining/storing the record and the required retention time. **Form SSP03b/F/02 – Record Log** can be used for this purpose.

**8 RECORDS AND PROJECT DOCUMENTATION**

8.1.1 Not applicable.

**9 RECOMMENDED TOOLS AND FORMS**

- a. **SSP03b/F/01** – Document Log
- b. **SSP03b/F/02** – Record Log

**10 GUIDANCE**

**10.1 General**

10.1.1 General advice on document control and record keeping procedures can be found in the ISO 14001, ISO 14004, OHSAS 18001 and various sections of JSP418.

10.1.2 If a management system (ISO 9000 or otherwise) is already in place within ASEG which includes document control and/or record keeping, ASEG should follow these requirements or procedures as an alternative to this procedure, so long as it is satisfied they meet the same objectives.

10.1.3 Where there is no formalised project management system or no pre-existing arrangements for record keeping, then this procedure should be followed to establish appropriate record keeping arrangements.

**10.2 Warnings and Potential Risks**

10.2.1 If the POSMS and POEMS documents are not appropriately controlled there is a risk

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Support Procedures

Part 1

SSP03b

SSP03b: Document and Record Control - ASEG

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that IPTs could be following out of date procedures. This could result in problems and inconsistencies in managing safety and environmental issues throughout the acquisition community.

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Form SSP03b/F/01 – Document Log						
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Form SSP03b/F/02 – Record Log					
Title	Date created	Record owner	Security status	Retention time	Record stored at:

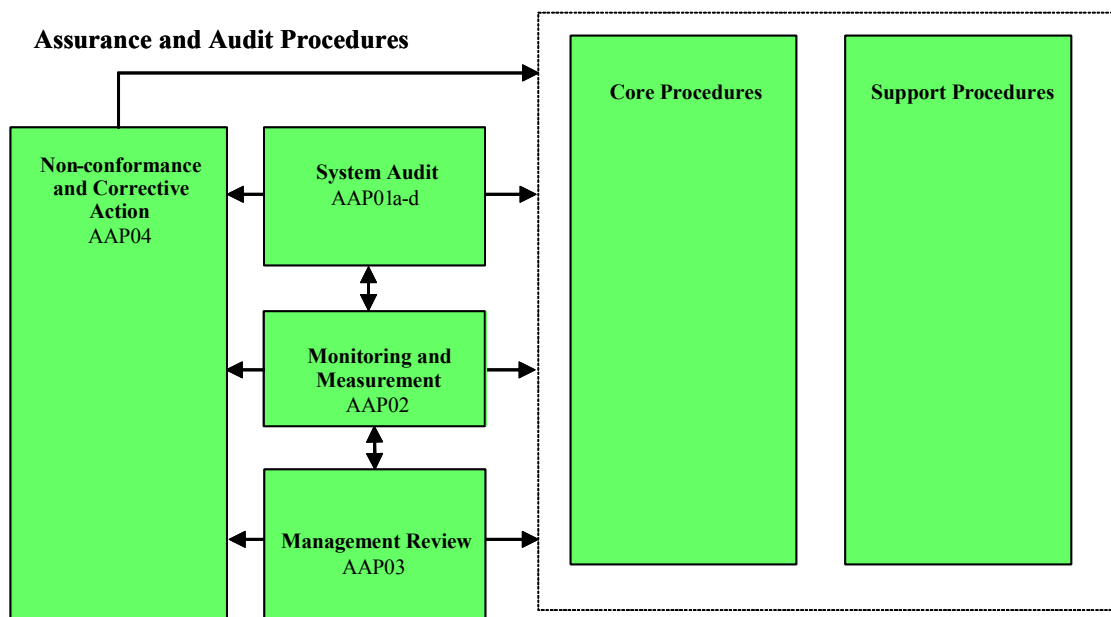
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## 8. ASSURANCE AND AUDIT PROCEDURES

Table 8.1 – POSMS and POEMS Assurance and Audit Procedures

Number	Procedure Type	Procedure Name
AAP01a	Assurance and Audit Procedures	System Audit (Audit Management and Initiation)
AAP01b	Assurance and Audit Procedures	System Audit (Audit Planning)
AAP01c	Assurance and Audit Procedures	System Audit (Audit Conduct)
AAP01d	Assurance and Audit Procedures	System Audit (Audit Reporting and Follow up)
AAP02	Assurance and Audit Procedures	Monitoring and Measurement
AAP03	Assurance and Audit Procedures	Management Review
AAP04	Assurance and Audit Procedures	Non-conformance and Corrective Action

Figure 8.1 The Assurance and Audit Procedures



### 8.1 Procedure Structure

8.1.1 For ease of use, the procedures have the same format and structure. The key sections are:

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## 8.2 Procedure Title

8.2.1 The title and reference code for the procedures are as follows:

- AAP01 - System Audit;
- AAP02 - Monitoring and Measurement;
- AAP03 - Management Review; and
- AAP04 - Non-conformance and Corrective Action.

8.2.2 The assurance and audit procedures are common to both the POEMS and POSMS.

## 8.3 Showing Conformance

8.3.1 This explains the three ways of showing conformance with the procedure.

## 8.4 Introduction

8.4.1 This is an overview of the procedure's purpose in the context of the overall management system.

## 8.5 Procedure Objectives

8.5.1 This section describes what is to be achieved by following and completing the procedures. Normally this section is in the form of a list of the objectives that need to be achieved in order to demonstrate conformance.

## 8.6 Responsibilities

8.6.1 This section states who will be accountable and responsible for proper completion of the procedure and who will actually carry out the actions within the procedure. In most cases the IPT will be responsible for procedure management while procedure completion could be carried out by a number of different parties as shown in the procedures.

## 8.7 When

8.7.1 This section indicates when the procedure is to be followed in terms of the SMS or EMS implementation.

## 8.8 Required Inputs

8.8.1 Most of the procedures require reference to be made to the outputs of previous procedures and information from other sources. This section lists the main reference material that will be needed in order to complete the procedure.

## 8.9 Required Outputs

8.9.1 This lists the outputs, for example completed forms, compiled information etc. It should be noted, however, that it is acceptable within POSMS and POEMS for an IPT to use alternative methods to those outlined in the procedures providing this is endorsed by ASEG.

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## **8.10 Records and Project Documentation**

8.10.1 This includes advice on where outputs of the procedures should be kept and recorded (usually in the Safety or Environmental Case, Case Reports, or related registers and logs) and where other project documentation may need to include some or all of the output information.

## **8.11 Description**

8.11.1 This section makes up the bulk of the procedure and describes the steps and stages involved in completing the procedure. It includes advice and guidance on how to complete the procedure and when to use each of the associated forms or tools. It should be remembered that this part of the procedure is for guidance only so it is not mandatory for an IPT to follow it to the letter where they have made suitable and equivalent alternative arrangements. The key point is to achieve the required objectives, outputs and outcomes, and to ensure that alternative approaches are clearly documented and agreed.

## **8.12 Recommended Tools and Forms**

8.12.1 Many of the procedures include tools or forms to assist IPTs to undertake the procedure or to record information produced. This section lists the forms that may be useful in completing the procedure. This can sometimes include forms associated with other procedures. Note that the use of the forms is not mandatory (see Required Outputs above) and that any alternative approaches used should be clearly documented and agreed.

## **8.13 Guidance**

8.13.1 This final section provides guidance on other sources of advice. Also included here are some general comments on potential project risk that may arise if the procedure is not completed in an appropriate way or at an appropriate time.

## **8.14 Procedure Use**

8.14.1 The IPT is responsible for managing the completion of the requirements of the Assurance and Audit procedures. The IPT is also likely to have a significant involvement in the practical application of the procedures. A number of other parties may also have significant roles in meeting the requirements of the procedures, these are detailed within the relevant procedures.

8.14.2 All procedures provide recommended guidance and/or forms to help the user to produce the desired output(s). The use of this guidance is not mandatory, as long as suitable alternative methodologies are used which achieve the desired objectives, as defined in the procedure and that are deemed by ASEG to be equivalent. Therefore three options exist when following the procedures, to demonstrate conformance:

- Follow the defined system procedure using the recommended guidance and tools, including allowed variations and options.

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<b>Assurance and Audit Procedures</b>	<a href="http://www.defencegateway.mod.uk" style="color: red;">www.defencegateway.mod.uk</a>	
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- Use an equivalent process and tool set generated elsewhere and document evidence of procedural equivalence.
- Use an equivalent bespoke process and tool set for the project and document evidence of procedural equivalence.

8.14.3 This is in contrast with the core procedures which have four options for showing conformance including one where the procedure is considered not relevant. However, the assurance and audit procedures will always be relevant and therefore need to be applied.

8.14.4 Table 8.2 overleaf shows a summary of the responsibilities, timing, inputs and outputs associated with each assurance and audit procedure.

### **8.15 Use of Assurance and Audit procedures outside POSMS and POEMS**

8.15.1 The assurance and audit procedures have primarily been developed for use within POSMS and POEMS but may be used for other system audits if desired. To this end, the following sections have been designed so they may be used together as a stand-alone Assurance and Audit Manual:

- Section 8 of POSMS and POEMS – Assurance and Audit Procedures
- AAP01a-d
- AAP02
- AAP03
- AAP04
- Section 9 – Glossary

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**Table 8.2 – Summary of POSMS and POEMS Assurance and Audit Procedures**

Procedure	When*	Input	Output **	Responsibility ***
AAP01a - System Audit (Audit Management and Initiation)	Concept	Environmental and Safety Case(s) including: <ul style="list-style-type: none"> <li>• Results of previous audits (<b>Form AAP01d/F/01</b>);</li> <li>• Record Management Reviews (<b>Form AAP03/F/01</b>);</li> <li>• Record of Monitoring and Measurement (<b>Form AAP02/F/02</b>);</li> <li>• Environmental Management Plans (<b>Form EMP06/F/03</b>);</li> <li>• Safety Plans (outputs from SMP03)</li> <li>• Non-Conformance and Corrective Actions (<b>Form AAP04/F/01</b>);</li> <li>• Register of Stakeholder Requirements (<b>Form EMP01/F/01</b> and <b>SMP01/F/02</b>)</li> <li>• Register of Standards (<b>Form EMP01/F/02</b> and <b>SMP01/F03</b>)</li> <li>• List of operational controls (<b>Form EMP07/F/01</b> and outputs from SMP08)</li> <li>• Other POSMS outputs.</li> </ul> Audit schedules produced by other parties where these cover auditing all or some of the elements of the SMS and EMS.	<ul style="list-style-type: none"> <li>• <b>AAP01a/F/01</b> - Audit Schedule</li> <li>• <b>AAP01a/F/02</b> - Audit Details, Team Composition and Competence Record</li> <li>• <b>AAP01a/F/03</b> – Notification of Audit Letter</li> </ul>	IPT, ASEG, supplier, or contractor.
AAP01b - System Audit (Audit Planning)	Concept	<ul style="list-style-type: none"> <li>• Audit Question Toolset (available from ASEG);</li> <li>• <b>Form AAP01a/F/01</b> - Audit Schedule;</li> <li>• <b>Form AAP01a/F/02</b> - Audit Details, Team Composition and Competence Record Form;</li> <li>• Other documents relevant to the scope and objective of the audit (i.e. POEMS, POSMS);</li> <li>• IPT safety and environmental management system documents; and</li> <li>• <b>Form AAP01d/F/01</b> - Previous audit reports</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Form AAP01b/F/01</b> - Audit Plan</li> <li>• <b>Form AAP01b/F/02</b> - Audit Pro-forma (partly complete)</li> </ul>	IPT, ASEG, supplier, or contractor.

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AAP01c - System Audit (Audit Conduct)	Concept	<ul style="list-style-type: none"> <li>• <b>Form AAP01b/F/01</b> - Audit Plan</li> <li>• <b>Form AAP01b/F/02</b> - Audit Pro-forma (partly complete)</li> <li>• Relevant IPT documentation;</li> <li>• <b>Form AAP04/F/01</b> – Non-conformance, Corrective and Preventive Action Form (If required).</li> <li>• <b>Form AAP01c/F/01</b> – Record of Audit Meeting.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>AAP04/F/01</b> – Non-conformance and Corrective Action Form</li> <li>• <b>AAP01b/F/02</b> - Audit Pro-forma(s) – (Fully complete)</li> <li>• <b>Form AAP01c/F/01</b> – Record of Audit Meeting (completed for Opening Meeting);</li> <li>• <b>Form AAP01c/F/01</b> – Record of Audit Meeting (completed for Audit Team Meeting(s)); and</li> <li>• <b>Form AAP01c/F/01</b> – Record of Audit Meeting (completed for Closing Meeting).</li> </ul>	IPT, ASEG, supplier, or contractor.
AAP01d - System Audit (Audit Reporting and Follow up)	Concept	<ul style="list-style-type: none"> <li>• <b>Form AAP01b/F/01</b> - Audit Plan;</li> <li>• <b>Form AAP01b/F/02</b> - Audit Pro-forma(s);</li> <li>• <b>Form AAP04/F/01</b> - Non-conformance and Corrective Action Form(s), if relevant (partly complete).</li> <li>• IPT documentation relevant to the audit;</li> <li>• <b>Form AAP01c/F/01</b> - Audit meeting records</li> </ul>	<ul style="list-style-type: none"> <li>• <b>AAP01d/F/01</b> - Audit Report Template</li> <li>• <b>AAP01d/F/02</b> – Audit Report Summary</li> <li>• <b>AAP04/F/01</b> - Non-conformance and Corrective Action Record, if relevant – (fully complete)</li> </ul>	IPT, ASEG, supplier, or contractor.
AAP02 – Monitoring and Measurement	Concept	<ul style="list-style-type: none"> <li>• <b>Form EMP06/F/02, Form EMP06/F/03</b> - Environmental Management Plans and outputs from SMP03);</li> <li>• Operational controls (<b>Form EMP07/F/01</b> and outputs from SMP07);</li> <li>• <b>Form AAP03/F/01</b> - Non-conformance and corrective action records;</li> <li>• <b>Form AAP03/F/01</b>- Management Review Records; and</li> <li>• Performance data on equipment system and supporting activities.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>AAP02/F/01</b> – Monitoring Schedule.</li> <li>• <b>AAP02/F/02</b> – Monitoring Data - Assessment Record.</li> </ul>	IPT and supplier/contractor.

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Procedure	When*	Input	Output **	Responsibility ***
AAP03 – Management Review	Concept	<ul style="list-style-type: none"> <li>EMS documents and records (Outputs of EMP01-EMP08).</li> <li>SMS documents and records (Outputs of SMP01 – SMP13).</li> <li>Results of internal and external SMS and EMS audits (AAP01).</li> <li>Internal and external communications regarding the IPTs’ SMS and EMS including suggestions for improvement (SSP01).</li> <li>Internal and external communications regarding the equipment’s safety and environmental performance including complaints (SSP01).</li> <li><b>Form AAP04/F/01</b> - Any non-conformance and corrective action reports raised</li> <li><b>Form AAP02/F/02</b> - Record of Monitoring Reviews</li> <li><b>Form AAP02/F/01</b> - Previous management review meeting minutes</li> </ul>	<ul style="list-style-type: none"> <li><b>AAP03/F/01</b> – Record of Management Review</li> </ul>	IPT and supplier/contract or
AAP04 – Non-conformance and Corrective Action	Concept	<ul style="list-style-type: none"> <li>Results of internal and external audits</li> <li>Internal and external communications regarding the IPT’s safety and environmental management(s), including suggestions for improvement. (See SSP01)</li> <li>Internal and external communications regarding the equipment’s safety and environmental performance, including complaints. (See SSP01)</li> <li><b>AAP02/F/02</b> – Record of Monitoring Review; and</li> <li><b>Form AAP03/F/01</b>- Management Review Records.</li> </ul>	<ul style="list-style-type: none"> <li><b>AAP04/F/01</b> – Non-Conformance and Corrective Action Record</li> </ul>	IPT, ASEG, supplier, or contractor.

\* The outputs from all the procedure require periodic review and update through out the lifecycle of the project.

\*\* Or equivalent actions and documentation that ASEG are satisfied achieves the same objectives.

\*\*\* The IPT or ASEG is responsible for managing the procedure completion. The column relates to who is or may be responsible for completing the procedure.

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## 8.16 System Audit Procedures AAP01

### *System Audit Structure*

- 8.16.1 There are four System Audit procedures as follows:
- AAP01a - Audit Management and Initiation
  - AAP01b - Audit Planning
  - AAP01c - Audit Conduct
  - AAP01d - Audit Reporting and Follow up
- 8.16.2 The System Audit procedures can be applied to the SMS or EMS at any time during its implementation, it is not necessary for the full system to be in place before planning and carrying out audits.
- 8.16.3 An IPT would be expected to have produced an audit schedule and audited each element of the SMS and EMS before Main Gate. Auditing will then continue throughout the life of the project(s).
- 8.16.4 These procedures have been based on the requirements of ISO 19011, ISO 14001, OHSAS 18001 standards and have been developed in line with other POEMS and POSMS procedures, and the various JSPs which cover system auditing.
- 8.16.5 The System Audit procedures are not intended to replace the audit sections of JSPs but to align with their requirements.
- 8.16.6 ASEG should be contacted if further advice or assistance is required on complying with these procedures.
- 8.16.7 If an IPT already has a project management system or procedures (eg ISO 9000) that cover system auditing these may be used in place of these POSMS and POEMS procedures so long as ASEG is satisfied they meet the same objectives.
- 8.16.8 Figure 8.2 below provides further details on each procedure's structure.

### *System Audit Purpose*

- 8.16.9 The system audit procedures have been produced to ensure that the IPT's SMS and EMS are audited throughout the life of the project(s). The System Audit procedures specify how system audits should be completed, and how combined safety and environmental management system audits can be completed. The procedures should not be used in lieu of auditor training and therefore do not cover auditing techniques in detail.

### *System Audit Objectives*

- 8.16.10 The objectives of undertaking system audits are to:
- Assess whether the IPT's SMS and EMS are operating as designed;
  - Assess compliance of the SMS and EMS with the requirements of POSMS and POEMS;

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- Identify opportunities to improve the SMS and EMS;
- Identify opportunities to improve safety and environmental performance;
- Identify opportunities to raise awareness, training and competency of safety and environmental issues;
- Provide assurance of compliance with applicable safety and environmental legal and non-legal standards;
- Comply with Functional Safety Boards' Policy requirement for audits;
- Recognise good practice;
- Inform the Management Review process;
- Inform policy development; and
- Identify opportunities to improve POEMS/POSMS Manuals (applies to ASEG only).

***System Audit Scope***

- 8.16.11 At the present time POEMS and POSMS are to be used to establish project level EMSs and SMSs by acquisition IPTs within DE&S. All activities that are undertaken or managed by the IPT, and which have a bearing on safety and environmental performance of the capability being acquired, have the potential to come within the scope of the audit procedures.
- 8.16.12 Activities undertaken by parties other than the IPT, and which are not undertaken under the management responsibility of the IPT are currently outside the scope of these audit procedures, although they may come under other audit regimes.
- 8.16.13 However information from other audit regimes, focussed on issues such as equipment performance, will be of use to the IPT and should be logged through the POEMS and POSMS communications procedures; and may depending on their nature give rise to non-conformance and corrective action reports within POEMS and POSMS. In addition non-conformance and corrective action identified under the audit regime established by POEMS and POSMS may be needed to be communicated to other parties, although the IPT may have no method of formally requiring the corrective action.

***System Audit Responsibilities***

- 8.16.14 Although the procedures have been produced primarily for use by IPTs they may also be used by ASEG to carry out audits on the SMS and EMS. In addition, other parties may also use these procedures for auditing all or parts of an IPT's SMS and EMS such as:
- Functional Safety Board Secretariats;
  - DS&C;
  - Third Parties invited by CDM;

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- Independent Safety Auditors;
- MOD and TLB Internal Audit Functions;
- Equipment system contractor;
- Personnel seconded from another IPT;
- Equipment User;
- SME;
- Environmental and Safety Consultants.

8.16.15 Any third party using these procedures should note that they have primarily been written for use by IPTs and therefore may use terminology specific to IPTs. However, this should not preclude a third party from using the procedures.

8.16.16 Throughout the procedures the term ‘Audit Client’ has been used to describe the group, organisation or individual commissioning an audit as this may be distinct from the party carrying out the audit.

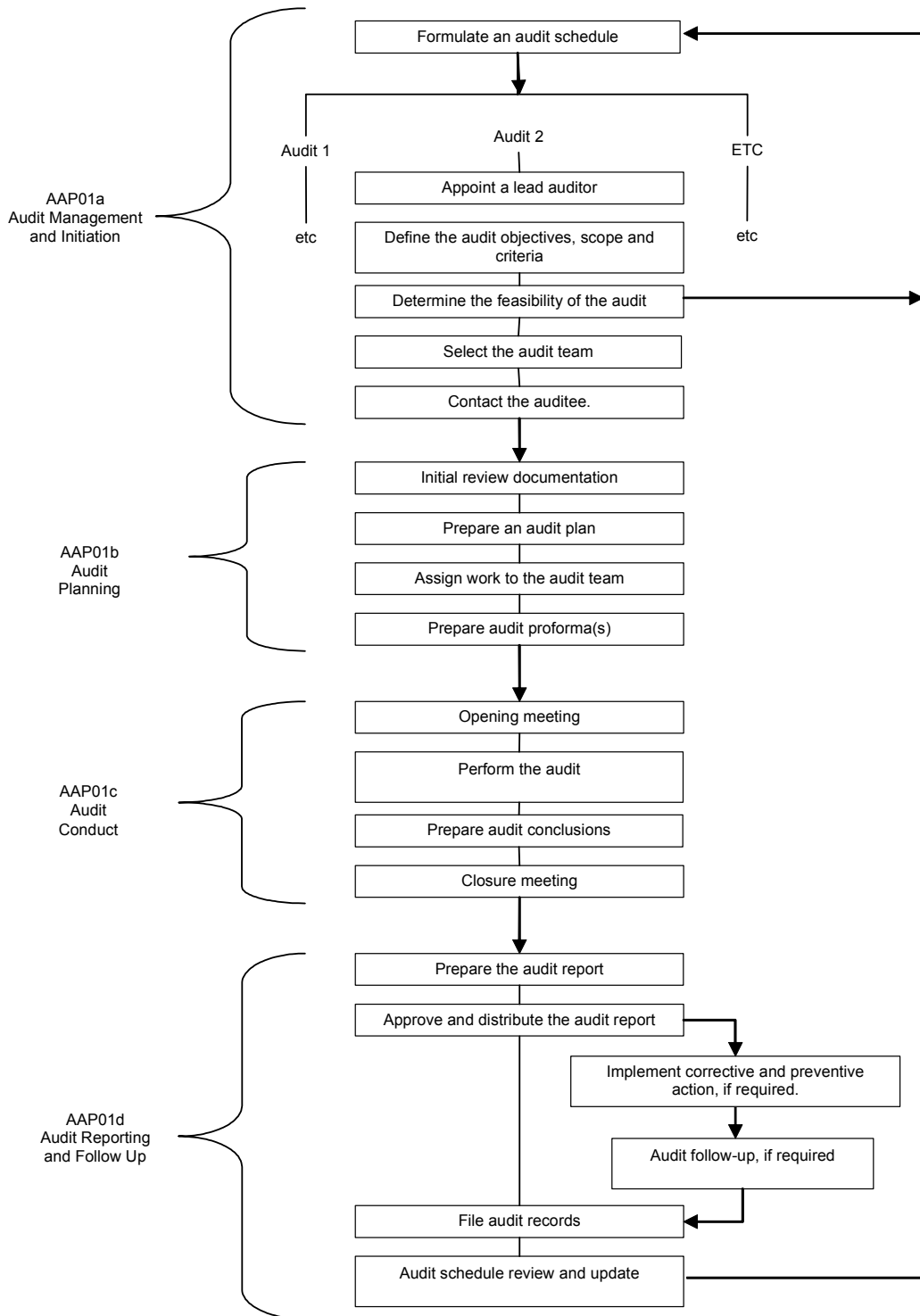
***System Audit Reporting***

8.16.17 The IPT should refer to its stakeholder forms (EMP01/F/01 and SMP01/F/02) to identify which stakeholders should receive a copy of the Audit Report. The following identifies some of the authorities or organisations that the IPT may decide to forward a copy of Audit Report:

- The delegation chain PM, IPTL, CDM, SofS (via DESB) and DG Clusters;
- Other TLBs through Annual Report to DESB;
- 2\* Directors and 1\* Deputy Directors;
- Functional Safety Boards and Secretariats;
- Directorate of Performance and Analysis and Defence Audit Committee (through Functional Safety Boards);
- DS&C;
- Stakeholders (Equipment Capability Customer and Equipment User, DE, CESOs etc.) through Safety Committees;
- Other Government Departments ( HSC, DEFRA, DTI etc.) through MOUs;
- Environment Agency for England and Wales;
- Scottish Environmental Protection Agency;
- Environment and Heritage Service for NI;
- General Public;
- ISAs and other Auditors;
- International Partners.

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Figure 8.2 The System Audit Process



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## **8.17 Monitoring and Measurement Procedure - AAP02**

8.17.1 The monitoring and measurement procedure is structured around the completion of the following steps:

- Step 1: Identify elements to be monitored and reviewed
- Step 2: Produce a Monitoring Schedule
- Step 3: Produce measurement and calibration protocols
- Step 4: Collect monitoring data
- Step 5: Assess monitoring date

8.17.2 The purpose of the monitoring and measurement is to track safety and environmental performance. During the early stages of CADMID an IPT will concentrate on tracking progress in the implementation of EMS and SMS, and then as the EMS and SMS are implemented, and objectives, targets and operational controls are developed, an IPT will turn its attention to tracking the performance of these as well as other performance measurements. Monitoring and measurement will identify areas for improvement in addition to changes to keep the management systems on track.

8.17.3 The results of monitoring and measurement would feed into the management review procedure.

## **8.18 Management Review Procedure - AAP03**

8.18.1 The management review procedure is structured around the completion of the following steps:

- Step 1: Assemble Management Review Team
- Step 2: Agree Frequency of Management Review
- Step 3: Gather Documents and Evidence for the Review
- Step 4: Perform and Record the Review

8.18.2 The purpose of the management review is to ensure that the SMS and EMS continue to be suitable, adequate and effective for the project they seek to manage. This review should be undertaken by senior managers and should not get involved in the details but rather, it should look at the 'big picture'. The review should identify areas for improvement in addition to changes to keep the systems on track.

8.18.3 The management review should cover all elements of the SMS and EMS. The IPT can choose whether to undertake the management review of the SMS and EMS separately or together. For example, if the IPT has a combined SMS and EMS it may be more efficient to combine the management review.

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## **8.19 Non-Conformance and Corrective Action Procedure - AAP04**

- 8.19.1 The management review procedure is structured around the completion of the following steps:
- Step 1: Identify non-conformance or observation
  - Step 2: Investigate non-conformance or observation
  - Step 3: Recommended corrective, preventive or improvement action
  - Step 4: Decide action to be taken
  - Step 5: Review and update or documentation
- 8.19.2 The purpose of the non-conformance and corrective action procedure is to provide a system for the identification, investigation and recording of non-conformances and observations and for the identification and implementation of appropriate corrective and preventive action. This is important as it allows the systems to be continually improved as a result of experience and past performance.
- 8.19.3 This procedure applies to all the elements of the SMS and EMS regardless of whether these are the responsibility of the IPT or a contractor.

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**0 SHOWING CONFORMANCE**

**0.1 Options**

0.1.1 There are three options to demonstrate conformance when applying this system procedure:

- a. Follow the defined system procedure using the recommended guidance and tools, including allowed variations and options.
- b. Use an equivalent process and tool set generated elsewhere and document evidence of procedural equivalence.
- c. Use an equivalent bespoke process and tool set for the project and document evidence of procedural equivalence.

**1 INTRODUCTION**

1.1.1 This procedure is the first in a set of four System Audit procedures and deals with initial audit planning activities. This procedure describes how an audit schedule can be developed in order to organise self audits of the IPT's SMS and EMS. The activities covered in this procedure will form the basis of the system audit process so it is important that issues are considered carefully to avoid duplication of effort or gaps in the audit process later on.

1.1.2 The audit schedule should describe the scope and frequency of self audits and set out a timeframe for their completion.

1.1.3 Although this and the companion procedures have been produced primarily for use by and on behalf of IPTs, they may also be used by ASEG to carry out audits on the SMS and EMS. In addition, these procedures may also be used for auditing all or parts of an IPT's SMS and EMS by other parties such as:

- Functional Safety Board Secretariats;
- DS&C;
- Third Parties invited by CDM;
- Independent Safety Auditors;
- MOD and TLB Internal Audit Functions;
- Equipment system contractor;
- Personnel seconded from another IPT;
- Customer 2;
- SME;
- Environmental and Safety Consultants.

1.1.4 Any third party using these procedures should note that they have primarily been written for use by IPTs and therefore may use terminology specific to IPTs. However,

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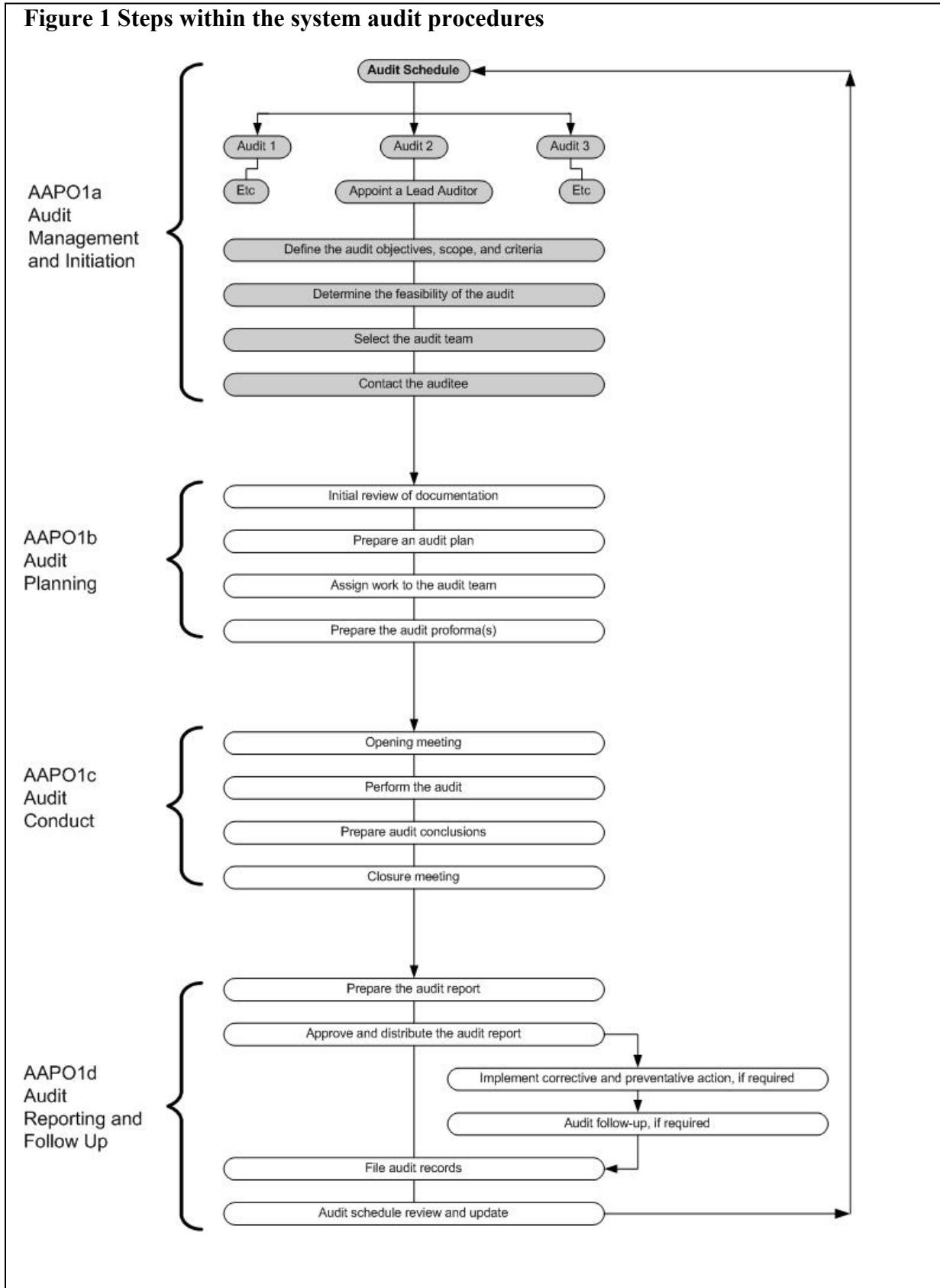
this should not preclude a third party from using the procedures.

1.1.5 Throughout the procedures the term ‘Audit Client’ has been used to describe the group, organisation or individual commissioning an audit, as this may be distinct from the party carrying out the audit.

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Figure 1 Steps within the system audit procedures



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**2 PROCEDURE OBJECTIVES**

2.1.1 The objectives of this procedure are to:

- Produce a schedule, for auditing all elements of the IPT’s SMS and EMS, that includes details on how and when these audits will take place;
- Ensure that audits are undertaken by appropriately competent auditors; and
- Contact the Auditee and confirm arrangements for undertaking the audit.

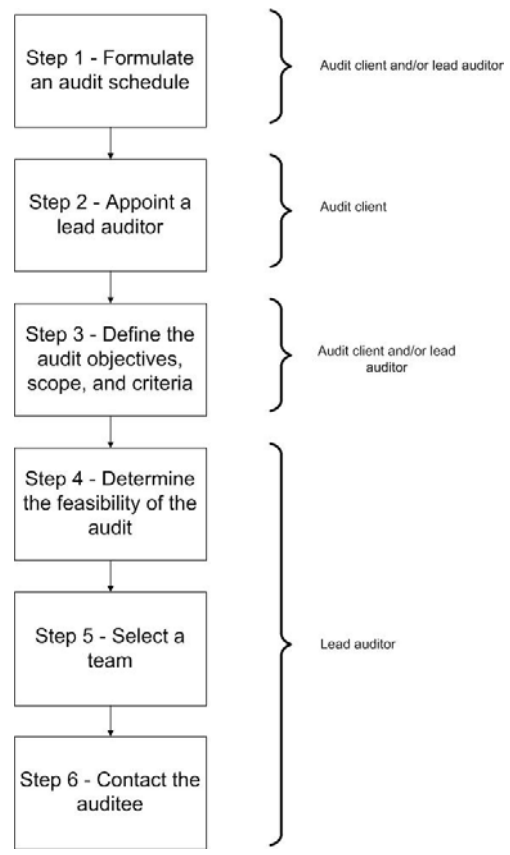
**3 RESPONSIBILITIES**

**3.1 Accountability**

3.1.1 The Audit Client is accountable for the completion of this procedure.

**3.2 Procedure Management and Procedure Completion**

3.2.1 The diagram below shows the steps described in the Description section of this procedure against those parties or individuals that may be responsible for their completion.



3.2.2 Note that where the Lead Auditor has responsibility, this may on particular occasions be delegated to members of the Audit Team.

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<b>4</b>	<b>WHEN</b>	<p>4.1.1 This procedure can be applied to the SMS or EMS at any time during its implementation, it is not necessary for the full system to be in place before planning and carrying out audits.</p> <p>4.1.2 An IPT will be expected to have produced an audit schedule and audited each element of its SMS and EMS before Main Gate. Auditing will continue throughout the life of the project(s).</p>
<b>5</b>	<b>REQUIRED INPUTS</b>	<p>5.1.1 Safety and Environmental Case(s), for example:</p> <ul style="list-style-type: none"> <li>• Results of previous audits (<b>Form AAP01d/F/01</b>);</li> <li>• Record of Management Reviews (<b>Form AAP03/F/01</b>);</li> <li>• Record of Monitoring and Measurement (<b>Form AAP02/F/02</b>);</li> <li>• Environmental Management Plans (<b>Form EMP06/F/03</b>);</li> <li>• Safety Management Plans (outputs from SMP03)</li> <li>• Non-Conformance and Corrective Actions (<b>Form AAP04/F/01</b>);</li> <li>• Register of Stakeholder Requirements (<b>Form EMP01/F/01</b> and <b>SMP01/F/02</b>)</li> <li>• Register of Standards (<b>Form EMP01/F/02</b> and <b>SMP01/F/03</b>)</li> <li>• List of operational controls (<b>Form EMP07/F/01</b> and outputs from SMP08)</li> <li>• Other POSMS and POEMS outputs.</li> </ul> <p>5.1.2 Audit schedules produced by other parties where these cover auditing all or some of the elements of the SMS and EMS.</p>
<b>6</b>	<b>REQUIRED OUTPUTS</b>	<p><b>Form AAP01a/F/01</b> - Audit Schedule</p> <p><b>Form AAP01a/F/02</b> - Audit Details, Team Composition and Competence Record Form</p> <p><b>Form AAP01a/F/03</b> – Notification of Audit Letter.</p> <p><b>OR</b></p> <p>Equivalent actions and documentation that ASEG is satisfied achieve the same objectives.</p>
<b>7</b>	<b>DESCRIPTION</b>	<p><b>7.1 Step 1 – Formulate an audit schedule</b></p> <p><i>Introduction</i></p>

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- 7.1.1 Note: Where the Audit Client wishes to involve the Lead Auditor in the production of the audit schedule then Step 2 – Appoint Lead Auditor should be completed before this step.
- 7.1.2 In order to produce an audit schedule the following must be decided:
- What elements of the SMS and EMS must the audits cover (i.e. scope);
  - How many audits are necessary;
  - How often will these audits be undertaken; and
  - When audits are to be undertaken.
- 7.1.3 In terms of scope the schedule can apply to:
- Individual project level SMS and EMSs; or
  - Several project level SMS and EMSs; or
  - An IPT level SMS and/or EMS.
- 7.1.4 The organisation and scope of the audit schedule will depend largely on how much of the SMS and EMS is in place and how these systems are organised within the IPT or project. For example, an IPT may decide to develop separate schedules for the SMS and EMS if the systems are distinct from each other, or combine schedules where elements are shared, similar or connected.
- 7.1.5 The overall audit schedule should cover all the existing elements of the SMS and EMS regardless of whether these are the responsibility of the IPT or a contractor.
- 7.1.6 When developing the schedule, consideration should be given to any other planned audits that may cover aspects of safety or environmental management. These other audits may fulfil some or all of the objectives of the audit schedule and may therefore be used as alternatives to avoid duplication of effort.
- Audit Scope***
- 7.1.7 Although it is possible to audit the whole SMS or EMS at once, this is generally considered poor practice (unless the systems are very simple), as this may require significant Auditee and auditor resources.
- 7.1.8 It is therefore accepted practice to divide the audit schedule into a number of audits each of which is a manageable task. This can be done in a number of ways:
- By POSMS / POEMS and IPT SMS/EMS requirement - This involves the auditing of the whole project(s) against each POSMS / POEMS and IPT SMS/EMS requirement in turn. This approach may cross several activities and/or projects/organisations.
  - By POSMS / POEMS procedure – This approach allows a full audit trail to be gathered.
  - By activity, project, organisation or geographical basis – This approach provides a full audit trail only when all departments have been assessed.

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- By safety risk or environmental impact - Full audit trails are obtained by crossing projects, organisations or activities, although the audit can be difficult to structure.
- 7.1.9 When deciding on how to partition the audit schedule, the following issues should be considered:
- Purpose of the audit;
  - Any external requests for an audit to take place. For example, from:
    - The delegation chain PM, IPTL, Cluster DG, CDM, SofS (via DESB);
    - Other TLBs;
    - 2\* Directors and 1\* Deputy Directors;
    - Functional Safety Boards;
    - ASEG;
    - DS&C; and
    - Stakeholders (Customer 1 and 2, DE, CESOs etc) through Safety Committees.
  - Scope of the EMS and SMS;
  - Relevant domain JSP auditing requirements;
  - Stakeholders’ expectations;
  - Existing IPT audit regimes including any audits planned or recently completed by other parties.
  - Logistics;
  - Where different parts of the same management system are best audited together;
  - Where elements of the safety and environmental management systems are best audited together;
  - The auditees and auditors likely to be involved;
  - Timeframe for implementing the management system(s); and
  - The frequency that the system element needs to be audited (i.e. try not to group elements of the management system which are best audited at a different frequency).
- 7.1.10 SMS and EMS elements would be expected to be audited more frequently in the following situations:
- They have not been covered or only partially covered by previous audits;
  - A high number of non-conformances have been identified;
  - There is a high safety risk or priority environmental impact;
  - Accidents, incidents or occurrences with safety or environmental implications have been reported;

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- A prescriptive legal or other standard applies;
  - There is a demonstrable level of stakeholder interest or concern;
- 7.1.11 There may also be a need for more frequent audits in cases where:
- The project is approaching a critical milestone;
  - There has been a major change in procedures, equipment system specification or use, or environmental and safety standards;
  - There have been major staff changes.
- 7.1.12 When you have partitioned up the audit schedule into manageable pieces, double check that all elements to be audited are being covered.
- Audit Frequency***
- 7.1.13 The next task in formulating the audit schedule is to set a frequency for how often each audit should be completed. Audit frequency should be kept to a minimum to reduce the likelihood of ‘audit fatigue’ in the Auditee, but frequent enough to provide assurance that the management system(s) is operating effectively.
- 7.1.14 The frequency of audits will vary from project to project but should aim to cover each element of the management system(s) at least once every 3 years. To avoid ‘over-auditing’ it is recommended that each element of the management system should be audited no more frequently than every 6 months (this excludes follow-up checks).
- 7.1.15 The IPT should refer to the relevant domain JSP to establish whether it requires a shorter minimum auditing interval (higher frequency). Audit frequency may also be influenced by stakeholders’ expectations, existing IPT’s regimes and Project Review and Assurance (PR&A) schedules.
- Documentation and Communication***
- 7.1.16 Form AAP01a/F/01 - Audit Schedule can be used to record the scope, frequency and timing of audit(s).
- 7.1.17 For audits where the audit client is not the IPTL, it is recommended that the Auditee should be contacted at this early stage to give them advance notice of the impending audit. **Form AAP01a/F/03** may be used for this purpose.
- 7.2 Step 2 – Appoint the Lead Auditor**
- 7.2.1 For each audit defined in the audit schedule, a Lead Auditor should be appointed. The Lead Auditor may be selected from any of the following groups:
- The Audit Client;
  - The equipment system contractor, (eg where they have a significant role in implementing the SMS and/or EMS)\*;
  - From another IPT than is to be audited\*\*;
  - SMEs (eg Safety and/or Environmental Consultants)\*\*;
  - Another part of the MOD.

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\* Where an IPT uses equipment system contractors to audit the SMS or EMS, then the IPT is to undertake sample checks on the audit schedule to ensure the procedure has been followed correctly.

\*\* The use of these parties may be helpful in cases where it is important to demonstrate the independence of the auditors from the IPT.

7.2.2 The following aspects should be considered when appointing the Lead Auditor:

- Auditing competency;
- Knowledge of POSMS and POEMS;
- Equipment system and domain knowledge;
- Personal attributes; and
- Security clearance.

7.2.3 Further information on establishing and evaluating auditor competency can be found in guidance sheet **AAP01a/G/01 – Auditor Competency Interim Guidance**.

**7.3 Step 3 – Define the audit objectives, scope and criteria**

7.3.1 Although the audit schedule defines the general scope of the audit, more detail on its scope, objectives and criteria should be defined by the Audit Client and Lead Auditor (see Section 8 of POSMS and POEMS).

7.3.2 Audit criteria should be used to determine the tests for conformity with the objectives of the audit and be defined through discussions between the Audit Client and the Lead Auditor. **Form AAP01a/F/02 - Audit Details, Team Composition and Competence Record Form** can be used to record these decisions.

7.3.3 As part of the audit, the Audit Client may also request that the Lead Auditor:

- Provides recommendations to address any non-conformance identified;
- Reviews corrective and preventive actions proposed by Auditee; and
- Completes follow-up checks to confirm non-conformances have been closed out.

**7.4 Step 4 – Check the feasibility of the audit**

7.4.1 The Auditee should be given sufficient notice that an audit will be taking place and be made aware of the objectives, scope and criteria of the audit. This will not only remind the Auditee of the planned audit, but also allow the feasibility of undertaking the audit as timetabled to be confirmed. **Form AAP01a/F/03 – Notification of Audit Letter** may be used for this purpose.

7.4.2 Factors that will affect the feasibility of undertaking the audit at a particular time will include the availability of:

- Sufficient and appropriate information to plan the audit; and
- Adequate time and resources of the Auditee and auditors.

7.4.3 If it has been determined that it is not feasible to undertake the audit, an alternative solution should be agreed between the Audit Client, Lead Auditor and Auditee.

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<b>7.5</b>	<b>Step 5 – Select the audit team</b>
7.5.1	Depending on the scope, size, and timescale of the audit, an Audit Team may consist of only the Lead Auditor, or it may consist of a number of auditors. When selecting members of the Audit Team, the following issues should also be considered: <ul style="list-style-type: none"> <li>• Audit objectives, scope and criteria (See <b>Form AAP01a/F/02</b>);</li> <li>• Independence of the Audit Team and the entity being audited;</li> <li>• Audit timescales (See <b>Form AAP01a/F/02</b>);</li> <li>• Auditor availability; and</li> <li>• Competence of Audit Team to achieve audit objectives.</li> </ul>
7.5.2	It is reasonable to include Aspirant Auditors within the Audit Team as a means to improve their competence level for future audits, as long as the aspirant auditor is not permitted to audit without appropriate direction and guidance from a competent auditor(s). On particularly large or complex audits it may be advisable to have administrative support within the Audit Team. Note it is also possible to meet skills or knowledge requirements through the inclusion of an auditing expert or Subject Matter Expert to support the Audit Team.
7.5.3	Further information on establishing and evaluating auditor competency can be found in guidance sheet <b>AAP01a/G/01 - Auditor Competency Interim Guidance</b> .
<b>7.6</b>	<b>Step 6 – Contacting the Auditee</b>
7.6.1	The Lead Auditor should contact the Auditee to arrange an initial visit prior to the onsite audit phase. This should take place no less than 1 month before the site audit to allow the Auditee sufficient time to prepare for the audit.
7.6.2	The objectives of this initial visit include: <ul style="list-style-type: none"> <li>• For the Auditee to understand the purpose of the audit;</li> <li>• To enable audit methodology, limitations and timetable to be discussed;</li> <li>• For the Auditee to meet the Lead Auditor (or team member) and for them to explain who has been appointed on the Audit Team;</li> <li>• To establish Auditee role/contribution to the audit (e.g. to provide a guide to escort the team during the audit and provide access to areas, documentation and staff)</li> <li>• To identify staff to be interviewed and their availability;</li> <li>• To agree office and support arrangements for the Audit Team;</li> <li>• For the Lead Auditor to gain an understanding of the area(s) to be audited;</li> <li>• To identify documentation which will be required to be examined before and during the audit;</li> <li>• To confirm confidentiality of documentation; and</li> <li>• To facilitate the production of the audit plan.</li> </ul>

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- 7.6.3 Where the Lead Auditor considers that an initial site visit is not appropriate or required, then planning for the audit can be made by letter/e-mail etc. Issues to consider in deciding whether a site visit is required are as follows:
- Existing familiarity with the area being audited;
  - Travel time/costs; and
  - Type, scope and depth of audit.
- 7.6.4 The Lead Auditor may also utilise a Pre-Audit Questionnaire where they consider that this would be of benefit to the audit process. The time the Auditee will need to complete the questionnaire should be minimal and the questionnaire should only be used to gather information to assist in the audit planning and document review stage, not as a replacement of work which should be completed during the on-site audit.
- 7.6.5 Where the Auditee objects to any members of the Audit Team completing the audit, then they should have a strong justified reason for doing so before another team member is appointed. Where the Audit Client and Auditee are unable to agree on a particular Audit Team member (including the Lead Auditor) then this should be referred to ASEG.

**8 RECORDS AND PROJECT DOCUMENTATION**

8.1.1 Where relevant, the outputs from this procedure should feed into the following:

- Assurance and Audit Procedure AAP01b – Audit Planning

8.1.2 A copy of the information produced by following this procedure should be stored in the Project Safety and Environmental Cases as appropriate.

**9 RECOMMENDED TOOLS AND FORMS**

- a. **Form AAP01a/F/01** - Audit Schedule
- b. **Form AAP01a/F/02** - Audit Details, Team Composition and Competence Record Form
- c. **AAP01a/G/01** – Auditor Competency Interim Guidance
- d. **Form AAP01a/F/03** – Notification of Audit Form

**10 GUIDANCE**

**10.1 General**

10.1.1 JSP 375, 430, 454, 518, 520, 538, 553 and the SHEF audit manual all include information on auditing. The ISO14000 series is useful, particularly ISO14001 and ISO14004, and also OHSAS 18001, ISO 19011 and ISO9001.

10.1.2 Although auditing Customer 2 is out of the scope of the audit procedure, information provided by Customer 2 in showing compliance with SMS and EMS requirements, and required equipment system safety and environmental performance (e.g. objectives and targets and operational controls) should be included in the audit.

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- 10.1.3 If an IPT already has a project management system or procedures (eg ISO 9000) that cover system auditing, then these may be used in place of these POSMS and POEMS procedures so long as ASEG is satisfied that they meet the same objectives.
- 10.1.4 Further guidance on the application of this procedure can be obtained from ASEG. The Institute of Environmental Management and Assessment (IEMA) and Institute of Safety and Health (IOSH) are professional bodies in environmental and safety auditing respectively and may hold useful information on auditing (Further information can be found at <http://www.iema.net> & <http://www.iosh.co.uk> ).
- 10.2 Aligning Safety and Environment**
- 10.2.1 The key alignment opportunity in this procedure is to ensure that both safety and environmental issues are audited together, where this is practical and beneficial.
- 10.3 Guidance for ASEG**
- 10.3.1 In addition to completing sample audits of IPT’s safety and environmental managements systems, ASEG should ensure that it also audits its compliance against the procedures which solely apply to ASEG, eg SSP01b, SSP02b, SSP03b.
- 10.4 Warnings and Potential Project Risks**
- 10.4.1 If audits are not completed correctly or not completed at all, there is an increased risk that IPTs fail to operate effective SMS and EMS, which in turn increases the risk of poor or ineffective management of safety and/or environmental risks within the project(s). It may also lead to delays and cost impacts if shortcomings in the SMS and/or EMS are identified late, because rework may be required or approvals may be delayed.

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Form AAP01a/F/01 – Audit Schedule						
Project(s) Title						
IPT:						
Completed by:					Date:	
Reviewed by:					Date:	
Audit title or ref	Audit scope	Audit date	Audit Frequency	Date completed	Auditee's details	Additional information

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Form AAP01a/F/02 – Audit Details, Team Composition and Competence Record			
<b>Project(s) Title</b>			
<b>IPT:</b>			
<b>Completed by:</b>		<b>Date:</b>	
<b>Reviewed by:</b>		<b>Date:</b>	
<b>Audit title or ref:</b>			
<b>Lead Auditor (name and organisation):</b>			
<b>Audit team (names &amp; organisations):</b>			
<b>Competency details of each member of team (See Form AAP01a/G/01)</b>			
<b>Audit scope:</b>			
<b>Audit objectives:</b>			
<b>Audit criteria:</b>			
<b>Auditee:</b>			
<b>Planned date for audit:</b>			
<b>Security classification:</b>	Unrestricted / Restricted / Secret / Top-Secret		
<b>Additional information:</b>			

<b>AAP01a/G/01 – Audit Competency Interim Guidance</b>	
<p>There are 3 main parties involved in auditing the safety and environmental management systems in POEMS and POSMS, these being:</p> <ul style="list-style-type: none"> <li>• <b>Lead Auditor</b> – The person responsible for leading and managing an audit and audit team.</li> <li>• <b>Auditor</b> – A person who forms part of an audit team</li> <li>• <b>Aspirant Auditor</b> – A person who forms part of the audit team who is undergoing training, or other development process, in order to attain auditor status.</li> </ul>	
<b>General attributes of all auditors:</b>	
<b>Personal:</b>	<p><b>Auditors at all levels should be -</b></p> <ul style="list-style-type: none"> <li>• Ethical.</li> <li>• Open-minded.</li> <li>• Diplomatic.</li> <li>• Observant.</li> <li>• Perceptive.</li> <li>• Versatile.</li> <li>• Decisive.</li> <li>• Self-reliant.</li> </ul>
<b>Knowledge and skills:</b>	<p><b>All staff involved in auditing POSMS and POEMS procedures should be able to:</b></p> <ul style="list-style-type: none"> <li>• Apply audit principles, procedures and techniques.</li> <li>• Conduct an audit (or designated task) within agreed time schedule.</li> <li>• Collect information through effective interviewing, listening, observing and reviewing relevant information.</li> <li>• Verify the accuracy of collected information.</li> <li>• Use correct documentation to record audit activities.</li> <li>• Prepare audit reports.</li> <li>• Maintain confidentiality.</li> <li>• Understand system standards.</li> <li>• Have an awareness of relevant laws, regulations and requirements.</li> <li>• Understand relevant environmental and safety terminology.</li> <li>• Understand environmental/safety management principles.</li> <li>• Understand relevant environmental and safety management tools.</li> </ul>

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<b>Aspirant auditor</b>	
<b>Competency and experience:</b>	<p>Initially the most important areas of experience and competence are the attributes outlined in the General Attributes section above. However, in addition aspirant auditors should:</p> <ul style="list-style-type: none"> <li>• Have some knowledge of, and the ability to apply (under supervision) audit processes.</li> <li>• Be proficient at effectively utilising their time during audits.</li> <li>• Provide assistance to the Lead Auditor and audit team members where required.</li> <li>• Help with the preparation and production of the audit report.</li> <li>• Understand MoD Safety and Environmental management requirements.</li> <li>• Have knowledge of ASEMS, POEMS and POSMS.</li> </ul>
<b>Auditor</b>	
<b>Competency and experience:</b>	<p>An Auditor is expected to:</p> <ul style="list-style-type: none"> <li>• Have successfully completed an accredited auditing course (eg ISO 14001, 9001, OHSAS 18001) or have equivalent practical training and experience.</li> <li>• Have gained experience in the entire audit process by participating in a minimum of two audits, including undertaking document review and audit reporting.</li> <li>• Be proficient at effectively utilising their time during audits.</li> <li>• Provide assistance to aspirant auditors.</li> <li>• Help with the preparation and production of the audit report.</li> <li>• Understand MoD safety and environmental management requirements.</li> <li>• Have knowledge of ASEMS, POEMS and POSMS.</li> </ul>
<b>Lead Auditor:</b>	
<b>Competency and experience:</b>	<p>A Lead Auditor is expected to:</p> <ul style="list-style-type: none"> <li>• Have successfully completed an accredited auditing course (eg ISO 14001, 9001, OHSAS 18001) or have equivalent practical training and experience.</li> <li>• Have acted as an auditor in at least two complete audits.</li> <li>• Advise on and interpret requirements of audit processes with sufficient breadth of experience, knowledge and depth of understanding, to be able to apply audit management requirements.</li> <li>• Generate an effective auditing strategy and plan, based on the identified audit requirements.</li> <li>• Be proficient at planning and effectively utilising resources during audits.</li> <li>• Organise and direct audit team members.</li> <li>• Provide guidance and assistance to aspirant auditors.</li> </ul>

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|  | <ul style="list-style-type: none"> <li>Lead the audit team to reach the audit conclusions.</li> <li>Prepare, complete and review the audit report.</li> <li>Understand MoD safety and environmental management requirements.</li> <li>Have knowledge of ASEMS, POEMS and POSMS and domain functional policy requirements. Do not forget that any audit must be able to inform the functional Boards that policy is being implemented effectively.</li> </ul> <p>Note that whilst Lead Auditors are required to have competencies in auditing and ASEMS, it is not necessary for them to be competent with the domain of the equipment and services being audited. The Lead Auditor can call on auditors with domain competence, or SMEs to support, or be part of, the audit team.</p> |
|--|--|

**AAP01a/F/03 – Notification of Audit Letter**

**Example letter to notify Auditee of an impending audit**

To: *(Auditee)*

**RE: PROJECT ORIENTED ENVIRONMENTAL AND SAFETY MANAGEMENT SYSTEM (POEMS/POSMS) AUDIT**

As part of the continual improvement in the operation of *(insert IPT/project(s))* safety and environmental management systems, I have been requested by *(insert Audit Client name)* to act as Lead Auditor for a system audit covering *(insert detail of scope of audit)* to be undertaken on *(Date)*.

The objectives of the audit will be *(Insert objectives of audit)*.

Please can you and/or your Safety Manager/Project Manager attend a pre-audit meeting with me and my colleague(s) *(insert name of Audit Team Member(s))* so we can discuss the audit process and scope and prepare for undertaking the audit.

Please do not hesitate to contact me *(insert contact details)* if you have any queries. Otherwise I will contact you in one week to confirm a mutually acceptable date and time for the pre-audit meeting.

From: *(Insert name Lead Auditor)*

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<b>AAP01a/G/01 – Audit Competency Interim Guidance</b>	
<p>There are 3 main parties involved in auditing the safety and environmental management system in POEMS and POSMS, these being:</p> <ul style="list-style-type: none"> <li>• <b>Lead Auditor</b> – The person responsible for leading and managing an audit and audit team.</li> <li>• <b>Auditor</b> – A person who forms part of an audit team</li> <li>• <b>Aspirant Auditor</b> – A person who forms part of the audit team who is undergoing training, or other development process, in order to attain auditor status.</li> </ul>	
<b>General attributes of all auditors:</b>	
<b>Personal:</b>	<p><b>Auditors at all levels should be -</b></p> <ul style="list-style-type: none"> <li>• Ethical.</li> <li>• Open-minded.</li> <li>• Diplomatic.</li> <li>• Observant.</li> <li>• Perceptive.</li> <li>• Versatile.</li> <li>• Decisive.</li> <li>• Self-reliant.</li> </ul>
<b>Knowledge and skills:</b>	<p><b>All staff involved in auditing POSMS and POEMS should be able to:</b></p> <ul style="list-style-type: none"> <li>• Apply audit principles, procedures and techniques.</li> <li>• Conduct audit (or designated task) within agreed time schedule.</li> <li>• Collect information through effective interviewing, listening observing and reviewing relevant information.</li> <li>• Verify the accuracy of collected information.</li> <li>• Use correct documentation to record audit activities.</li> <li>• Prepare audit reports.</li> <li>• Maintain confidentiality.</li> <li>• Understand system standards.</li> <li>• Have an awareness of relevant laws, regulations and requirements.</li> <li>• Understand relevant environmental and safety terminology.</li> <li>• Understand environmental/safety management principles.</li> <li>• Understand relevant environmental and safety management tools.</li> </ul>

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<b>Aspirant auditor</b>	
<b>Competency and experience:</b>	<p>Initially the most important areas of experience and competence are the attributes outlined in the General Attributes section above. However, in addition aspirant auditors should:</p> <ul style="list-style-type: none"> <li>• Have some knowledge of, and the ability to apply (under supervision) audit processes.</li> <li>• Be proficient at effectively utilising their time during audits.</li> <li>• Provide assistance to the Lead Auditor and audit team members where required.</li> <li>• Help with the preparation and production of the audit report.</li> <li>• Understand MoD Safety and Environmental management requirements.</li> <li>• Have knowledge of ASEMS, POEMS and POSMS.</li> </ul>
<b>Auditor</b>	
<b>Competency and experience:</b>	<p>An Auditor is expected to:</p> <ul style="list-style-type: none"> <li>• Have successfully completed an accredited auditing course (eg ISO 14001, 9001, OHSAS 18001) or have equivalent practical training and experience.</li> <li>• Have gained experience in the entire audit process by participating in a minimum of two audits, including undertaking document review and audit reporting.</li> <li>• Be proficient at effectively utilising their time during audits.</li> <li>• Provide assistance to aspirant auditors.</li> <li>• Help with the preparation and production of the audit report.</li> <li>• Understand MoD safety and environmental management requirements.</li> <li>• Have knowledge of ASEMS, POEMS and POSMS.</li> </ul>
<b>Lead Auditor:</b>	
<b>Competency and experience:</b>	<p>A Lead Auditor is expected to:</p> <ul style="list-style-type: none"> <li>• Have successfully completed an accredited auditing course (eg ISO 14001, 9001, OHSAS 18001) or have equivalent practical training and experience.</li> <li>• Have acted as an auditor in at least two complete audits.</li> <li>• Advise on and interpret requirements of audit processes with sufficient breadth of experience, knowledge and depth of understanding, to be able to apply audit management requirements.</li> <li>• Generate an effective auditing strategy and plan, based on the identified audit requirements.</li> <li>• Be proficient at planning and effectively utilising resources during audits.</li> </ul>

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	<ul style="list-style-type: none"> <li>• Organise and direct audit team members.</li> <li>• Provide guidance and assistance to aspirant auditors.</li> <li>• Lead the audit team to reach the audit conclusions.</li> <li>• Prepare, complete and review the audit report.</li> <li>• Understand MoD safety and environmental management requirements.</li> <li>• Have knowledge of ASEMS, POEMS and POSMS and domain functional policy requirements. Do not forget that any audit must be able to inform the functional Boards that policy is being implemented effectively.</li> </ul> <p>Note that whilst Lead Auditors are required to have competencies in auditing and ASEMS, it is not necessary for them to be competent with the domain of the equipment and services being audited. The Lead Auditor can call on auditors with domain competence, or SMEs to support, or be part of, the audit team.</p>
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**0 SHOWING CONFORMANCE**

**0.1 Options**

0.1.1 There are three options to demonstrate conformance when applying this system procedure:

- a. Follow the defined system procedure using the recommended guidance and tools, including allowed variations and options.
- b. Use an equivalent process and tool set generated elsewhere and document evidence of procedural equivalence.
- c. Use an equivalent bespoke process and tool set for the project and document evidence of procedural equivalence.

**1 INTRODUCTION**

1.1.1 This procedure is the second in a set of four System Audit procedures and deals with the details of planning the on-site audit.

1.1.2 Although this and the companion procedures have been produced primarily for use by and on behalf of IPTs, they may also be used by ASEG to carry out audits on the SMS and EMS. In addition, these procedures may also be used for auditing all, or parts of, an IPT's SMS and EMS by other parties such as:

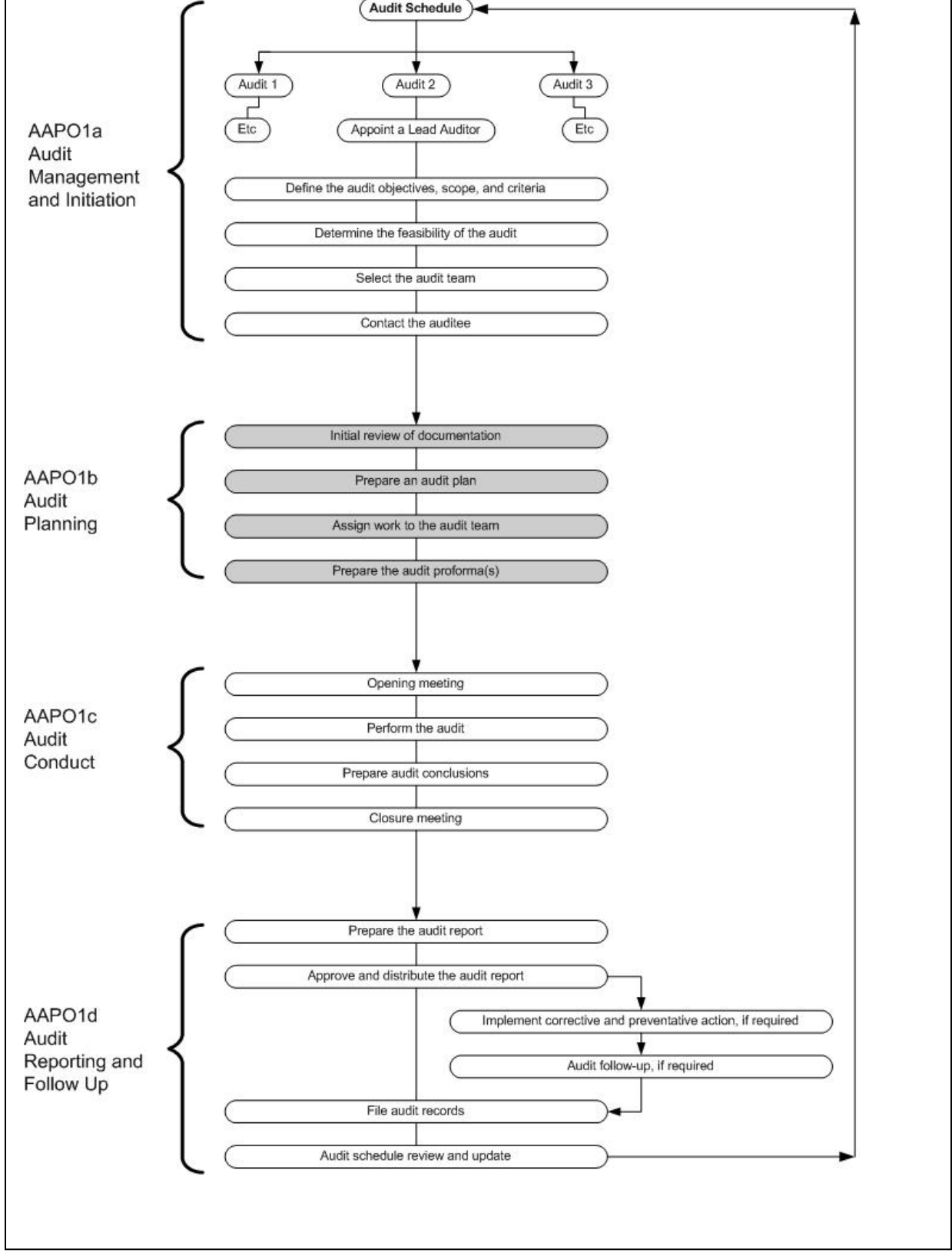
- Functional Safety Board Secretariats;
- DS&C;
- Third Parties invited by CDM;
- Independent Safety Auditors;
- MOD and TLB Internal Audit Functions;
- Equipment system contractor;
- Personnel seconded from another IPT;
- Customer 2;
- SME;
- Environmental and Safety Consultants.

1.1.3 Any third party using these procedures should note that they have primarily been written for use by IPTs and therefore may use terminology specific to IPTs. However, this should not preclude a third party from using the procedures.

Throughout the procedures the term 'Audit Client' has been used to describe the group, organisation or individual commissioning an audit, as this may be distinct from the party carrying out the audit.

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**Figure 1 Steps Within The System Audit Procedures**



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<b>2</b>	<b>PROCEDURE OBJECTIVES</b>	2.1.1 The objectives of this procedure are to: <ul style="list-style-type: none"> <li>• Produce a plan, for auditing any or all elements of the IPT’s SMS and EMS;</li> <li>• Assign work to the audit team; and</li> <li>• Prepare an Audit Pro-forma.</li> </ul>
<b>3</b>	<b>RESPONSIBILITIES</b>	3.1 <b>Accountability</b> 3.1.1 The Audit Client is accountable for the completion of this procedure. 3.2 <b>Procedure Management and Procedure Completion</b> 3.2.1 The Lead Auditor is responsible for ensuring that this procedure is managed and completed. The Lead Auditor may delegate tasks to members of the Audit Team in regards to the management and completion of this procedure.
<b>4</b>	<b>WHEN</b>	4.1.1 Immediately after the completion of Procedure AAP01a.
<b>5</b>	<b>REQUIRED INPUTS</b>	<ul style="list-style-type: none"> <li>• Audit Question Toolset (available from ASEG);</li> <li>• <b>Form AAP01a/F/01</b> - Audit Schedule;</li> <li>• <b>Form AAP01a/F/02</b> - Audit Details, Team Composition and Competence Record Form;</li> <li>• Other documents relevant to the scope and objective of the audit (e.g. POSMS / POEMS);</li> <li>• IPT SMS and EMS documents and records; and</li> <li>• <b>Form AAP01d/F/01</b> - Previous audit reports</li> </ul>
<b>6</b>	<b>REQUIRED OUTPUTS</b>	<p><b>Form AAP01b/F/01</b> - Audit Plan</p> <p><b>Form AAP01b/F/02</b> - Audit Pro-forma (partly complete)</p> <p><b>OR</b></p> <p>Equivalent actions and documentation that ASEG is satisfied achieve the same objectives.</p>

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<b>7</b>	<b>DESCRIPTION</b>
<b>7.1</b>	<b>Step 1 – Initial document review</b>
7.1.1	By following AAP01a the Lead Auditor should have identified and obtained any documents that have to be reviewed as part of the preparation for the audit. This documentation should include all the management system documents, records and any previous audit reports relevant to the scope of the audit. Previous audit reports should be examined to establish follow-up work which may be required and to ensure that the audit does not duplicate work completed in a recent audit.
7.1.2	If this document review reveals major non-conformances with the management system then the Lead Auditor may decide that it would be better to postpone the audit until the documentation discrepancies have been resolved. This should be discussed with the Audit Client before a decision is made and communicated to the Auditee.
<b>7.2</b>	<b>Step 2 – Prepare the Audit Plan</b>
7.2.1	The Lead Auditor must prepare an Audit Plan to ensure that the audit meets all the identified criteria and is carried out in a professional manner with efficient use of time and resources.
7.2.2	The Audit Plan should be written so it is flexible enough to permit any minor changes which may be needed during the course of the audit, for example additional staff may have to be interviewed.
7.2.3	The Audit Plan(s) should cover the following elements: <ul style="list-style-type: none"> <li>• Location of audit;</li> <li>• Audit scope and objectives (from Form AAP01a/F/01) and criteria (from AAP01a/F/02);</li> <li>• Reference documents;</li> <li>• Auditors’ details;</li> <li>• Auditee’s names and contact details; and</li> <li>• Audit date and timetable/on-site work agenda;</li> </ul>
7.2.4	The Audit Plan may also include: <ul style="list-style-type: none"> <li>• Areas and documents to inspect;</li> <li>• Any language requirements e.g. for production of audit report;</li> <li>• Logistic arrangements (travel, on-site facilities, etc);</li> <li>• On site administrative arrangement (site access, security clearance);</li> <li>• Health and safety issues associated with carrying out the audit; and</li> <li>• Any security requirements including document confidentiality.</li> </ul> <p><b>Form AAP01b/F/01</b> can be used to document the Audit Plan.</p>
7.2.5	Once the Audit Plan(s) has been drawn up, it should be approved by the Audit Client and Auditee before use. Any objections by the Auditee should be resolved between

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the Lead Auditor, the Auditee and the Audit Client. Any revised Audit Plan should then be agreed among the parties concerned before continuing.

**7.3 Step 3 - Assign work to the audit team**

7.3.1 The Lead Auditor, in consultation with the Audit Team, should assign each team member with specific tasks. The competency and independence of the Auditor Team members should be taken into consideration (see **Form AAP01/F/02**).

7.3.2 During the completion of this Step, the Lead Auditor may identify the need to make changes to the members of the Audit Team (e.g. all competences required are not covered in the Audit Team). If changes are required to be made to the Audit Team composition, then the Lead Auditor should amend **Form AAP01a/F/02** and inform the Auditee and Audit Client of this change.

**7.4 Step 4 - Prepare Audit Pro-forma(s)**

7.4.1 A key part of the planning stage will be to produce the Audit Pro-formas that will be used by the Audit Team members in the completion of the assigned audit tasks. These pro-formas will be generated by the Audit Team with reference to the Audit Plan and should include the audit questions. These should be identified by:

- Identifying which Question Toolset(s)(Available electronically at <http://www.ASEG.dii.r.mil.uk>) is relevant to the audit;
- Where necessary, tailoring the model questions from the relevant question sets to suit the audit criteria; and
- Adding further questions, based on audit-specific issues and knowledge of the project being audited.

7.4.2 The use of an Audit Pro-forma has many benefits including:

- It provides a structured set of questions, ensuring that no subject areas are inadvertently overlooked;
- It facilitates the smooth running of the audit, thereby causing minimal disruption to project work; and
- It provides a traceable and documented process of the generation of audit findings.

7.4.3 All Audit Pro-forma(s) should be reviewed by the Lead Auditor prior to use.

7.4.4 The Pro-forma(s) should be used in the audit to record:

- Audit Findings:
  - **Questioning:** How is the requirement satisfied?
  - **Evidence:** What evidence is provided in support?
  - **Auditor’s Opinion:** Draw conclusions from responses.
- Assessed level of compliance; and
- Notes (e.g. any recommendations that have been made as part of the audit).

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7.4.5 The ‘Assessed level of compliance’ field will record the Audit Team’s judgement on whether the Auditee has satisfied the specific area under review. The response to be recorded will be one of the following:

- **Assessed compliant:** No weaknesses observed: the required system procedure or process has been adhered to;
- **Non-conformance:** Example identified by the Audit Team where a required system procedure or process has not been adhered to (refer to AAP04 – Non-Conformance and Corrective Action); or
- **Observation:** Written report by the Audit Team which does not relate to a conformance issue but may otherwise be of benefit to the Auditee or the Audit Client, eg possible improvements (refer to AAP04 – Non-Conformance and Corrective Action).

7.4.6 **Form AAP01b/F/02** provides a blank Audit Pro-forma which should be used to record the questions to be asked by the auditors. Separate pro-formas may be completed per auditor/audit/system element.

**8 RECORDS AND PROJECT DOCUMENTATION**

8.1.1 Where relevant, the outputs from this procedure should feed into the following:

- Assurance and Audit Procedure - AAP01c

8.1.2 A copy of the information produced by following this procedure should be stored in the Project Safety and Environmental Cases as appropriate.

**9 RECOMMENDED TOOLS AND FORMS**

**Form AAP01b/F/01** - Audit Plan

**Form AAP01b/F/02** - Audit Pro-forma

Audit Question Toolsets (available from ASEG)

**10 GUIDANCE**

**10.1 General**

10.1.1 JSP 375, 430, 454, 518, 520, 538, 553 and the SHEF audit manual all include information on auditing. The ISO14000 series is useful, particularly ISO14001 and ISO14004, and also OHSAS 18001, ISO 19011 and ISO9001.

10.1.2 Although audits of Customer 2 are outside the scope of the system audits, information provided by Customer 2 which relates to SMS and EMS requirements or the safety and environmental performance of the equipment (e.g. objectives and targets and operational controls) should be included in the audit.

10.1.3 If an IPT already has a project management system or procedures (e.g. ISO 9000) that

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cover system auditing, then these may be used in place of these POSMS and POEMS procedures so long as ASEG is satisfied that they meet the same objectives.

10.1.4 Further guidance on the application of this procedure can be obtained from ASEG. The Institute of Environmental Management and Assessment (IEMA) and Institution of Occupational Safety and Health (IOSH) are professional bodies in environmental and safety auditing respectively and may produce useful information on auditing. (Further information can be found at <http://www.iema.net> & <http://www.iosh.co.uk> ).

**10.2 Aligning Safety and Environment**

10.2.1 The key alignment opportunity in this procedure is to plan safety and environmental audits together, where this is practical and beneficial.

**10.3 Guidance for ASEG**

10.3.1 In addition to completing sample audits of IPTs’ SMS and EMSs, ASEG should ensure that audits are performed that check ASEG’s compliance with those procedures that apply directly to it eg SSP01b, SSP02b, SSP03b.

**10.4 Warnings and Potential Project Risks**

10.4.1 If audits are not completed or are incomplete, there is an increased risk that an IPT’s SMS or EMS does not achieve its objectives. This may lead to increased safety and environmental risks associated with the project. It may also lead to delays and cost impacts if shortcomings in the SMS and/or EMS are identified late, because rework may be required or approvals may be delayed.

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Form AAP01b/F/01 – Audit Plan			
<b>Project classification:</b>	<b>Security</b>		
<b>Project(s) Title</b>			
<b>IPT:</b>			
<b>Completed by:</b>		<b>Date:</b>	
<b>Reviewed by:</b>		<b>Date:</b>	
<b>Audit title/ref:</b>			
<b>Audit team details:</b>			
<b>Auditee's names and contact details</b>			
<b>Location of audit:</b>			
<b>Audit scope, objectives and criteria</b>			
<b>Reference documents:</b>			
<b>Audit date(s)</b>			
<b>Audit timetable/on-site work agenda</b>			
Where appropriate please document the following -			
<b>Areas and documents to inspect</b>			
<b>Language of audit process (if different to language of the auditor)</b>			
<b>Logistical arrangements (travel, on-site facilities, etc.)</b>			
<b>On-site administrative arrangements (site access, security clearance)</b>			
<b>Safety Issues</b>			
<b>Additional information:</b>			

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 A current version can be found within the Acquisition Safety and Environmental  
 Management System (ASEMS) held on the Acquisition System Guidance (ASG,  
 formerly the AOF). For Access to ASEMS via the ASG please register at  
[www.defencegateway.mod.uk](http://www.defencegateway.mod.uk)**

<b>MOD</b>	<b>ASEMS Procedures</b>	Procedure AAP01b
<b>AAP01b – Audit Planning</b>		Page 9

<b>Form AAP01b/F/02 – Audit Pro-forma</b>								
<b>Project(s) Title</b>								
<b>IPT:</b>								
<b>Completed by:</b>			<b>Date:</b>					
<b>Reviewed by:</b>			<b>Date:</b>					
<b>Audit title/ref.</b>			<b>Pro-forma ref.</b>					
<b>Auditor(s)</b>			<b>Pro-forma objective</b>					
<b>Interviewee(s)</b>			<b>Pro-forma scope</b>					
Question Reference	Source Document	Audit Question	Guidance for Auditor	Questioning	Evidence	Auditor's Opinion	Assessed Level of Compliance	Actions

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<b>MOD</b>	<b>www.defencegateway.mod.uk</b> ASEMS Procedures	Procedure AAP01b
<b>AAP01b – Audit Planning</b>		Page 2

<b>On-site administrative arrangements (site access, security clearance)</b>	
<b>Safety Issues</b>	
<b>Additional information:</b>	

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**0 SHOWING CONFORMANCE**

**0.1 Options**

0.1.1 There are three options to demonstrate conformance when applying this system procedure:

- a. Follow the defined system procedure using the recommended guidance and tools, including allowed variations and options.
- b. Use an equivalent process and tool set generated elsewhere and document evidence of procedural equivalence.
- c. Use an equivalent bespoke process and tool set for the project and document evidence of procedural equivalence.

**1 INTRODUCTION**

1.1.1 This is the third of four System Audit procedures and describes how system audits should be performed. Once the audit plan has been agreed and the audit pro-formas compiled, the audit can take place. Details of how the audit will be undertaken will have been defined in the Audit Plan and should include opening and closing meetings in addition to the collection, verification and documentation of audit findings and conclusions.

1.1.2 Although this and the companion procedures have been produced primarily for use by and on behalf of IPTs, they may also be used by ASEG to carry out audits on the SMS and EMS. In addition, these procedures may also be used for auditing all or parts of an IPT's SMS and EMS by other parties such as:

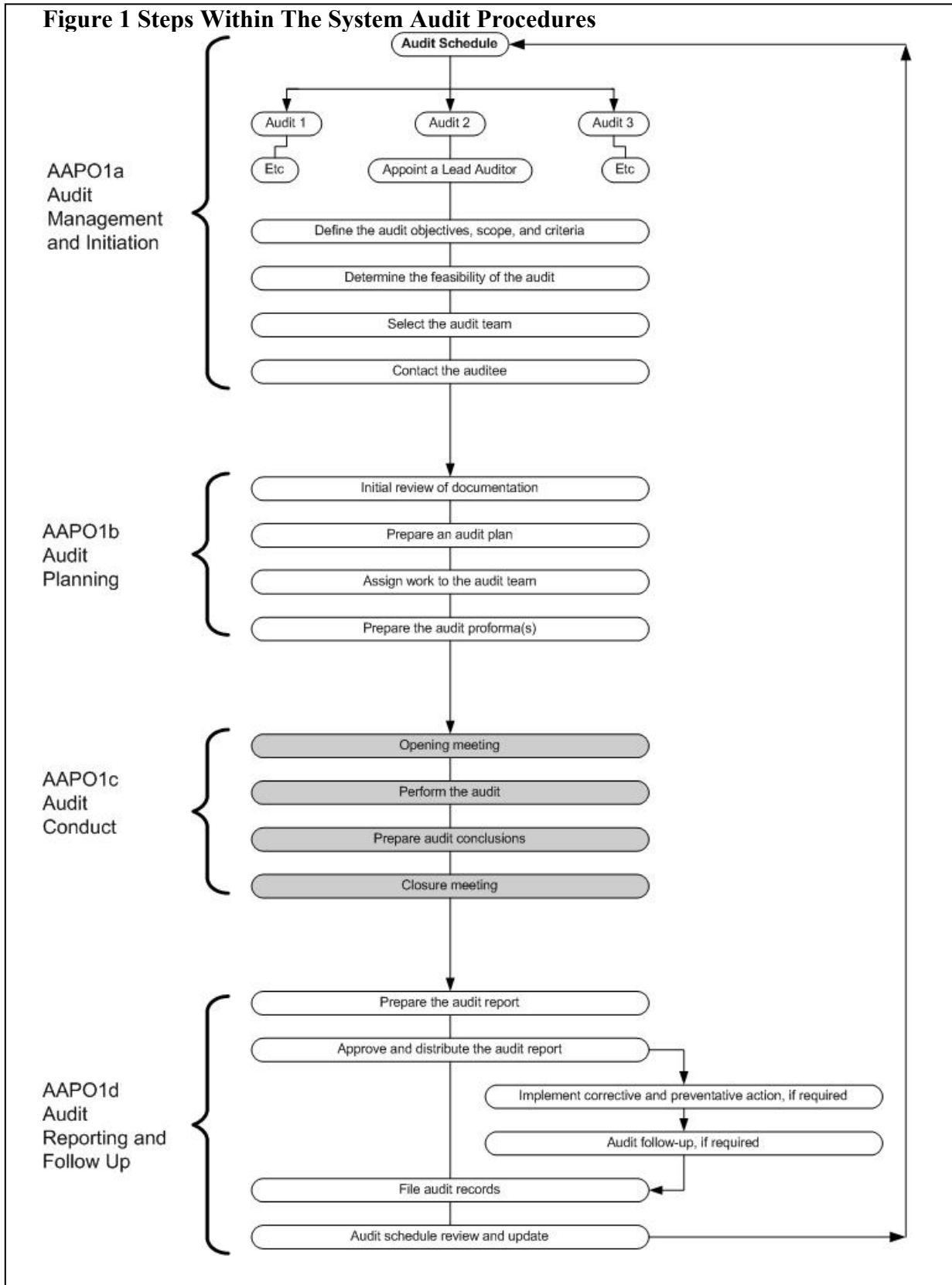
- Functional Safety Board Secretariats;
- DS&C;
- Third Parties invited by CDM;
- Independent Safety Auditors;
- MOD and TLB Internal Audit Functions;
- Equipment system contractor;
- Personnel seconded from another IPT;
- Customer 2;
- SME;
- Environmental and Safety Consultants.

1.1.3 Any third party using these procedures should note that they have primarily been written for use by IPTs and therefore may use terminology specific to IPTs. However, this should not preclude a third party from using the procedures.

Throughout the procedures the term 'Audit Client' has been used to describe the group, organisation or individual commissioning an audit, as this may be distinct from the party carrying out the audit.

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**Figure 1 Steps Within The System Audit Procedures**



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<b>2</b>	<p><b>PROCEDURE OBJECTIVES</b></p> <p>2.1.1 The objectives of this procedure are to:</p> <ul style="list-style-type: none"> <li>• Ensure that audits are performed efficiently and effectively in accordance with the Audit Plan;</li> <li>• Identify non-conformances and observations when performing audits.</li> </ul>
<b>3</b>	<p><b>RESPONSIBILITIES</b></p> <p><b>3.1 Accountability</b></p> <p>3.1.1 The Audit Client is accountable for the completion of this procedure.</p> <p><b>3.2 Procedure Management and Procedure Completion</b></p> <p>3.2.1 The Lead Auditor is responsible for ensuring that this procedure is managed and completed. The Lead Auditor may delegate tasks to members of the Audit Team in regards to the management and completion of this procedure.</p>
<b>4</b>	<p><b>WHEN</b></p> <p>4.1.1 As per the Audit Plan.</p>
<b>5</b>	<p><b>REQUIRED INPUTS</b></p> <ul style="list-style-type: none"> <li>• <b>Form AAP01b/F/01</b> - Audit Plan;</li> <li>• <b>Form AAP01b/F/02</b> - Audit Pro-forma (partially completed in AAP01b);</li> <li>• Relevant IPT documentation;</li> <li>• <b>Form AAP04/F/01</b> – Non-conformance and Corrective Action Form (if needed); and</li> <li>• <b>Form AAP01c/F/01</b> – Record of Audit Meeting.</li> </ul>
<b>6</b>	<p><b>REQUIRED OUTPUTS</b></p> <p><b>Form AAP04/F/01</b> – Non-conformance and Corrective Action Form;</p> <p><b>Form AAP01b/F/02 - Audit Pro-forma(s) – Fully completed;</b></p> <p><b>Form AAP01c/F/01</b> – Record of Audit Meeting (completed for Opening Meeting);</p> <p><b>Form AAP01c/F/01</b> – Record of Audit Meeting (completed for Audit Team Meeting(s)); and</p> <p><b>Form AAP01c/F/01</b> – Record of Audit Meeting (completed for Closing Meeting).</p> <p><b>OR</b></p> <p>Equivalent actions and documentation that ASEG is satisfied achieve the same objectives.</p>

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<b>7</b>	<b>DESCRIPTION</b>
<b>7.1</b>	<b>Step 1 - Opening meeting</b>
7.1.1	On the day of the audit it is good practice to hold an opening meeting on-site before the audit commences. This should be attended by the Auditee and Audit Team and can include the following issues: <ul style="list-style-type: none"> <li>• Introduce Audit Team members to the Auditee(s);</li> <li>• Confirm that the resources and facilities needed by the Audit Team are available;</li> <li>• Briefly discuss the audit scope, objectives and methodology;</li> <li>• Briefly discuss the Audit Plan, (e.g. personnel and areas to be interviewed);</li> <li>• Confirm communication arrangements between the Audit Team and the Auditee;</li> <li>• Confirm the roles and responsibilities of any guides and observers that may be used;</li> <li>• Confirm any security or confidentiality arrangements;</li> <li>• Confirm the circumstances under which the audit may be terminated;</li> <li>• Safety and housekeeping arrangements; and</li> <li>• Confirm the time and date for the closing meeting and any interim meetings of the Audit Team and the Auditees.</li> </ul>
7.1.2	The above could be used as a basis for the agenda for the opening meeting. Minutes from the opening meeting should be recorded on <b>Form AAP01c/F/01 – Record of Audit Meeting</b> .
7.1.3	It is important in the meeting to allay any concerns the Auditee may have, for example by explaining that the audit is to assist them rather than to judge. The Auditee should be allowed the opportunity to clarify any concerns they may have regarding the audit. Minutes of this meeting, including a record of attendees should be taken and kept. The meeting will be chaired by the Lead Auditor.
<b>7.2</b>	<b>Step 2 – Perform the audit</b>
7.2.1	The aim of the on-site audit is to obtain objective evidence on actual practices (current and past) and to identify the degree of compliance and any areas for potential improvement. The Audit Pro-formas should be used to record the audit findings.
7.2.2	Non-conformances and any subsequent recommendations should be recorded by the Audit Team following procedure AAP04 – Non-conformance and Corrective Action.
7.2.3	Interviews, observations, document review and reviews of previous audits are all acceptable methods for collecting evidence to support the audit findings. Auditors should aim to follow an audit trail and may ask additional questions to those in the Audit Pro-formas, where they consider that this will assist the audit process.
7.2.4	Auditors should attempt to compile and document evidence that can be evaluated

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against the audit criteria to form the audit findings. Where possible this should be verifiable, although anecdotal evidence can be used as a basis for audit findings. In many cases, audit findings may be based on opinions formed by examining samples of data or information, rather than whole datasets, and this element of uncertainty should be acknowledged when presenting the audit findings.

7.2.5 Any potential non-conformance should be discussed immediately with the interviewee so they understand the basis of the non-conformance and agree that the audit finding is accurate.

7.2.6 Evidence collected during the audit which suggests that there is a safety or environmental risk which requires immediate attention (even if this is not within the scope of the audit) should be reported without delay to the Lead Auditor, who should report it immediately to the Auditee. Any concerns relating to non-urgent issues identified that are outside the scope of the audit should be noted and reported to the Lead Auditor who should then report it to the Audit Client and Auditee.

7.2.7 If during the course of the audit it becomes apparent that the objectives of the audit are not going to be achieved, this should be reported and appropriate action determined between the Lead Auditor, the Audit Client and the Auditee. Such actions may include the modification to the Audit Plan, changes to the audit objectives or scope or, if necessary, the termination of the audit.

7.2.8 Guides from the Auditee organisation used to accompany the Audit Team must not be permitted to have any influence over, or cause interference with, the conduct of the audit. Their purpose is only to assist the Audit Team and act on the request of the Lead Auditor. They may be required to undertake any or all of the following:

- Establish contacts and times for interviews;
- Arrange visits;
- Ensure that safety and security arrangements are communicated and followed;
- Act as witness for the Auditee; and
- Provide clarification or assist in the collection of information.

7.2.9 The Lead Auditor should supervise the Audit Team throughout the audit and review any audit findings at the close of each day. **Form AAP01c/F/01** – Record of Audit Meeting may be used to record these meetings. He/she should also ensure that the Audit Team can contact him/her to discuss any issues that may arise through the course of the audit.

**7.3 Step 3 - Prepare audit conclusions**

7.3.1 After completing the audit the Audit Team should meet to:

- Review the audit findings, and any other appropriate information collected during the audit, against the audit objectives;
- Agree on the audit conclusions, taking into account the uncertainty inherent in the audit process;

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- Prepare recommendations, if this is one of the audit’s objectives; and
  - Discuss audit follow-up, if the Audit Client has specified that this will be part of the auditor role.
- 7.3.2 **Form AAP01c/F/01** – Record of Audit Meeting can be used to record this meeting.
- 7.4 Step 4 – Closure meeting**
- 7.4.1 The closing meeting should be chaired by the Lead Auditor and be attended by the Auditee, and possibly the Audit Client. Minutes of the meeting, including a list of attendees, should be made by a member of the Audit Team and included in the Audit Report. The closing meeting may include:
- An informal debrief for the Auditee;
  - A summary of the audit activities and findings;
  - Overview of system strengths and weaknesses;
  - Discussion of preliminary findings, including non-conformances (highlighting any findings requiring immediate attention);
  - Discussion of any findings that can be closed out immediately by the Auditee.
  - Audit limitations (e.g. situations encountered during the audit that may decrease the reliance that can be placed on the audit conclusions);
  - Address Auditee questions or concerns;
  - Where included within the objectives of the audit, recommended corrective/preventive actions. (The Auditee should be made aware that these are recommendations, and they will have the opportunity to later propose actions they consider more appropriate);
  - Discuss timeframe for issuing draft Audit Report;
  - Discuss scope and contents and recipients of the Audit Report; and
  - Where required, agree timeframe for the Auditee to present a corrective/preventive action plan.
- 7.4.2 The above could be used as a basis for the agenda for the closing meeting. Minutes from the closing meeting should be recorded on **Form AAP01c/F/01** – Record of Audit Meeting.
- 7.4.3 Diverging opinions regarding the audit findings and/or conclusions between the Audit Team and the Auditee should be discussed and resolved where possible. Any unresolved issues will be noted and reported to the Audit Client.

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<b>8</b>	<b>RECORDS AND PROJECT DOCUMENTATION</b>
8.1.1	<p>Where relevant, the outputs from this procedure should feed into the following:</p> <ul style="list-style-type: none"> <li>• Assurance and Audit Procedure AAP01d</li> </ul> <p>A copy of the information produced by following this procedure should be stored in the Project Safety and Environmental Cases as appropriate.</p>
<b>9</b>	<b>RECOMMENDED TOOLS AND FORMS</b>
	a. <b>Form AAP01c/F/01 – Record of Audit Meeting.</b>
<b>10</b>	<b>GUIDANCE</b>
<b>10.1</b>	<b>General</b>
10.1.1	JSP 375, 430, 454, 518, 520, 538, 553 and the SHEF audit manual all include information on auditing. The ISO14000 series is useful, particularly ISO14001 and ISO14004, and also OHSAS 18001, ISO 19011 and ISO9001.
10.1.2	Although audits of Customer 2 are out with the scope of the system audits, information provided by Customer 2 which relates to SMS and EMS requirements or the safety and environmental performance of the equipment (e.g. objectives and targets and operational controls) should be included in the audit.
10.1.3	If an IPT already has a project management system or procedures (eg ISO 9000) that cover system auditing, then these may be used in place of these POSMS and POEMS procedures so long as ASEG is satisfied that they meet the same objectives.
10.1.4	Further guidance on the application of this procedure can be obtained from ASEG. The Institute of Environmental Management and Assessment (IEMA) and Institution of Occupational Safety and Health (IOSH) are professional bodies in environmental and safety auditing respectively and may produce useful information on auditing. (Further information can be found at <a href="http://www.iema.net">http://www.iema.net</a> & <a href="http://www.iosh.co.uk">http://www.iosh.co.uk</a> ).
<b>10.2</b>	<b>Aligning Safety and Environment</b>
10.2.1	The key alignment opportunity in this procedure is to plan safety and environmental audits together, where this is practical and beneficial.
<b>10.3</b>	<b>Guidance for ASEG</b>
10.3.1	In addition to completing sample audits of IPTs’ SMS and EMSs, ASEG should ensure that audits are performed that check ASEG’s compliance with those procedures that apply directly to it eg SSP01b, SSP02b, SSP03b.
<b>10.4</b>	<b>Warnings and Potential Project Risks</b>
10.4.1	If audits are not completed or are incomplete there is an increased risk that an IPT’s SMS or EMS does not achieve its objectives. This may lead to increased safety and environmental risks associated with the project. It may also lead to delays and cost impacts if shortcomings in the SMS and/or EMS are identified late, because rework may be required or approvals may be delayed.

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<b>Form AAP01c/F/01 – Record of Audit Meeting</b>			
<b>Project(s) Title</b>			
<b>IPT:</b>			
<b>Audit title or ref:</b>			
<b>Completed by:</b>		<b>Date:</b>	
<b>Reviewed by:</b>		<b>Date:</b>	
<b>Date of meeting:</b>			
<b>Location of meeting:</b>			
<b>Attendees:</b>			
<b>Minutes:</b>			

**0 SHOWING CONFORMANCE**

**0.1 Options**

0.1.1 There are three options to demonstrate conformance when applying this system procedure:

- a. Follow the defined system procedure using the recommended guidance and tools, including allowed variations and options.
- b. Use an equivalent process and tool set generated elsewhere and document evidence of procedural equivalence.
- c. Use an equivalent bespoke process and tool set for the project and document evidence of procedural equivalence.

**1 INTRODUCTION**

1.1.1 This fourth and final System Audit procedure deals with the activities to be conducted after the on-site audit has been completed.

1.1.2 Although this and the companion procedures have been produced primarily for use by and on behalf of IPTs, they may also be used by ASEG to carry out audits on the SMS and EMS. In addition, these procedures may also be used for auditing all or parts of an IPT's SMS and EMS by other parties such as:

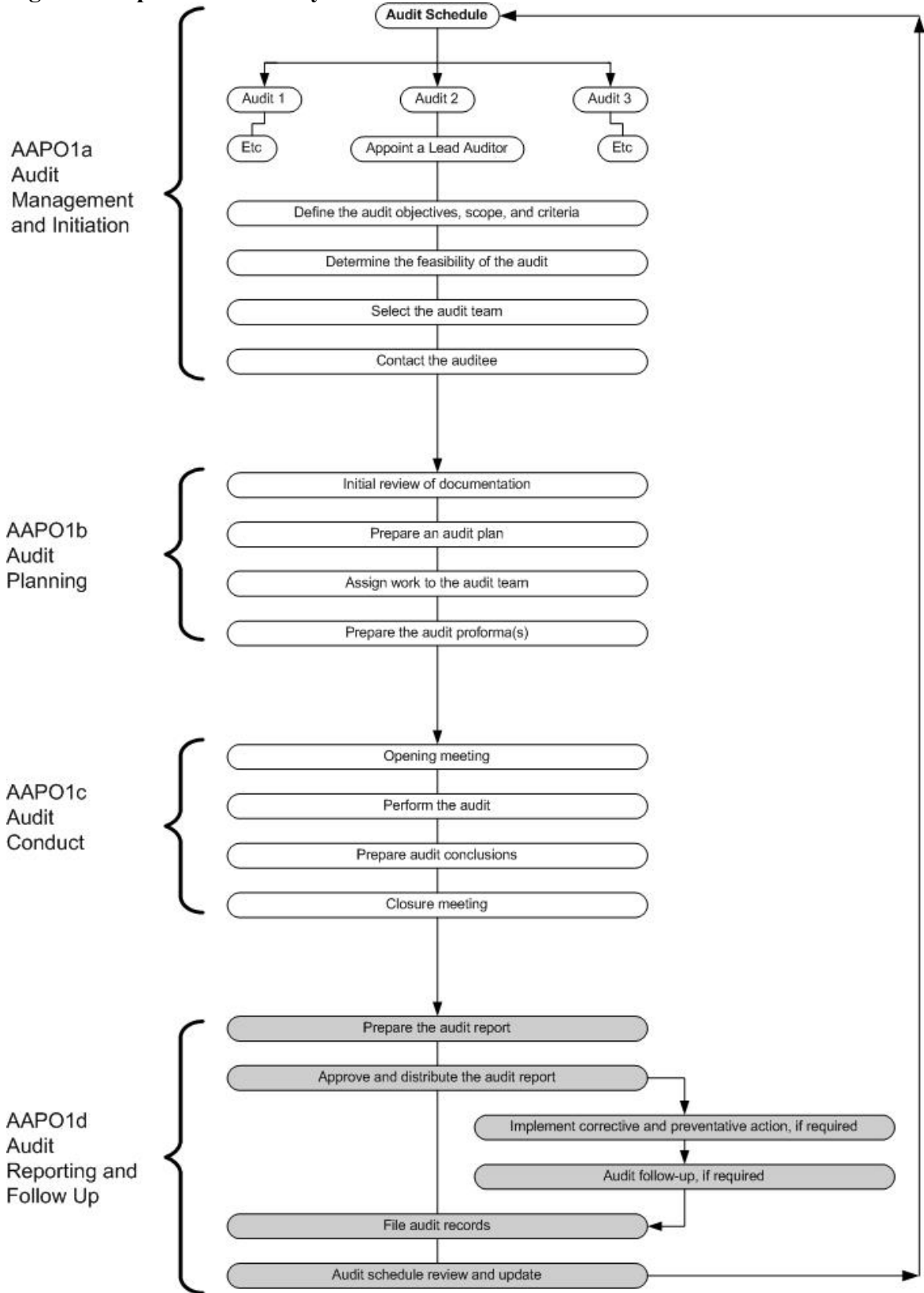
- Functional Safety Board Secretariats;
- DS&C;
- Third Parties invited by CDM;
- Independent Safety Auditors;
- MOD and TLB Internal Audit Functions;
- Equipment system contractor;
- Personnel seconded from another IPT;
- Customer 2;
- SME;
- Environmental and Safety Consultants.

1.1.3 Any third party using these procedures should note that they have primarily been written for use by IPTs and therefore may use terminology specific to IPTs. However, this should not preclude a third party from using the procedures.

1.1.4 Throughout the procedures the term 'Audit Client' has been used to describe the group, organisation or individual commissioning an audit, as this may be distinct from the party carrying out the audit.

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**Figure 1 Steps Within The System Audit Procedures**



**2 PROCEDURE OBJECTIVES**

2.1.1 The objectives of this procedure are to:

- Produce and circulate an Audit Report, once authorised;
- Ensure that audit records are stored and communicated appropriately;
- Ensure that audit follow-up is planned and that the audit schedule is updated;
- Ensure that any audit reports are provided to ASEG.

**3 RESPONSIBILITIES**

**3.1 Accountability**

3.1.1 The Audit Client is accountable for the completion of this procedure.

**3.2 Procedure Management and Procedure Completion**

3.2.1 The Lead Auditor is responsible for ensuring that this procedure is managed and completed. The Lead Auditor may delegate tasks to members of the Audit Team in regards to the management and completion of this procedure.

**4 WHEN**

4.1.1 This procedure should be conducted once the on-site audit has been completed, as defined in Procedure AAP01c.

**5 REQUIRED INPUTS**

- **Form AAP01b/F/01** Audit Plan;
- **Form AAP01b/F/02** Audit Pro-forma(s);
- **Form AAP04/F/01** Non-conformance and Corrective Action Form(s), if relevant (partly complete).
- IPT documentation relevant to the audit;
- **Form AAP01c/F/01** - Audit meeting records

**6 REQUIRED OUTPUTS**

Audit Report (based on **Form AAP01d/F/01** - Audit Report Template)

**Form AAP04/F/01** - Non-conformance and Corrective Action Form(s), if relevant – (fully completed)

**OR**

Equivalent actions and documentation that ASEG is satisfied achieve the same objectives.

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<b>7</b>	<b>DESCRIPTION</b>
<b>7.1</b>	<b>Step 1 - Prepare the Audit Report</b>
7.1.1	On completion of the audit an Audit Report should be drafted as agreed between the Lead Auditor and Audit Client. The Lead Auditor will be responsible for the preparation and content of this report. Where the audit covered safety and environmental issues, the Audit Client can request that these are reported separately.
7.1.2	An Audit Report will contain the following: <ul style="list-style-type: none"> <li>• Introduction and background to the audit;</li> <li>• Audit dates and locations; (Available from <b>AAP01b/F/01</b> – Audit Plan)</li> <li>• Audit scope, criteria and objectives; (Available from <b>AAP01b/F/01</b> – Audit Plan)</li> <li>• Description of audit approach and methodology;</li> <li>• Audit Client;</li> <li>• Audit Team; (Available from <b>AAP01b/F/01</b> – Audit Plan)</li> <li>• Areas of strength and areas for improvement;</li> <li>• Audit findings;</li> <li>• Conclusions; and</li> <li>• The confidential nature of the contents.</li> </ul>
7.1.3	The Audit Report may also include the following, as appropriate and agreed with the Audit Client: <ul style="list-style-type: none"> <li>• Audit limitations (e.g. situations encountered during the audit that may decrease the reliance that can be placed on the audit conclusions; areas not covered, although within the audit scope)</li> <li>• Any unresolved diverging opinions between the Audit Team and the Auditee;</li> <li>• Recommendations for improvement, where the Audit Client has specified in the audit objectives that this is required as part of the audit;</li> <li>• Agreed follow-up action plans, (e.g. follow-up meeting), where specified in the audit objectives; and</li> <li>• Annexes;             <ul style="list-style-type: none"> <li>○ Audit Team Composition and Competence Record Form (Form <b>AAP01a/F/02</b>);</li> <li>○ Audit Plan (Form <b>AAP01b/F/01</b>);</li> <li>○ Audit Pro-formas (Form <b>AAP01b/F/02</b>);</li> <li>○ Non-conformance and Corrective Action Forms (Form <b>AAP04/F/01</b>)</li> <li>○ Opening and closing meeting minutes</li> </ul> </li> </ul>

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**Form AAP01d/F/01** can be used to document the Audit Report.

7.1.4 The contents of the report should be easy to understand, concise and unambiguous. It should contain only that information which is supported by relevant audit evidence, and be independent, objective, fair and constructive. The Lead Auditor should consider the report's target audience and that it may be made publicly available under the Environmental Information Regulations or the Freedom of Information Act at some point in the future. The IPT should refer to its Register of Stakeholders (EMP01/F/01 and SMP01/F/02) to identify which stakeholders should receive a copy of the Audit Report.

**7.2 Step 2 - Approve and distribute the audit report**

7.2.1 Upon completion of the draft Audit Report, the Lead Auditor should forward the report to the Auditee for review and approval. The purpose of this review is to check for factual errors and not to negotiate the report's content. The Lead Auditor should propose a reasonable time by which the comments should be provided. The audit report should be finalised within 2 weeks to 1 month of receiving the comments.

7.2.2 The Lead Auditor should forward a copy of the dated final audit report to the Auditee, Audit Client, ASEG and other agreed recipients.

**7.3 Step 3 – Implement corrective/preventive actions**

7.3.1 After the final Audit Report has been issued, the Auditee should record non-conformance, observations, and (where specified in the audit objectives) recommended corrective and preventive action using Form AAP04/F/01.

7.3.2 Procedure AAP04 should be used to manage non-conformances and observations, noting the following:

- The Audit Client and/or Lead Auditor should review the corrective and preventive actions planned by the Auditee to ensure that they appropriately address the non-conformances raised. In the event that these are not considered to be acceptable, the Audit Client will contact the Auditee to agree an acceptable course of action. **Should this not be agreed, then the matter may be referred to ASEG for resolution.**
- The Auditee should keep the Audit Client informed of the status of the progress of corrective and preventive actions.

**7.4 Step 4 – Audit follow-up**

7.4.1 The completion and effectiveness of corrective and preventive actions for identified non-conformances should be verified. The verification can be completed in a number of ways, for example the follow up could be:

- part of the current audit;
- a separate task; or
- integrated within the next appropriate audit.

7.4.2 The results of the verification should be filed with the Audit Report. On completion

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of the follow-up tasks, the Audit Client will arrange for a copy of the non-conformance close out report to be sent to the Auditee and any other persons to whom the original audit report was sent.

**7.5 Step 5 – File audit records**

7.5.1 Documents pertaining to the audit should be retained or destroyed by agreement between the participating parties and in accordance with the management system(s) record procedure(s) and applicable statutory, regulatory and contractual requirements. The IPT should keep audit records within the Safety/Environment Case.

**7.6 Step 6 – Audit schedule review and update**

7.6.1 On completion of Step 5 above, the Audit Schedule should be reviewed and where necessary modified.

**8 RECORDS AND PROJECT DOCUMENTATION**

8.1.1 Where relevant, the outputs from this procedure should feed into the following:  
**Form AAP01a/F/01** - Audit Schedule;  
 AAP02 – Monitoring and Measurement;  
 AAP03 – Management Review; and  
 AAP04 – Non-conformance and Corrective Action.

8.1.2 A copy of the information produced by following this procedure should be stored in the Project Safety and Environmental Case(s).

**9 RECOMMENDED TOOLS AND FORMS**

**Form AAP01d/F/01** - Audit Report Template

**Form AAP04/F/01** – Non-Conformance and Corrective Action Report Form – fully completed.

**10 GUIDANCE**

**10.1 General**

10.1.1 JSP 375, 430, 454, 518, 520, 538, 553 and the SHEF audit manual all include information on auditing. The ISO14000 series is useful, particularly ISO14001 and ISO14004, and also OHSAS 18001, ISO 19011 and ISO9001.

10.1.2 Although audits of Customer 2 are outwith the scope of the system audits, information provided by Customer 2 which relates to SMS and EMS requirements or the safety and environmental performance of the equipment (e.g. objectives and targets and operational controls) should be included in the audit.

10.1.3 If an IPT already has a project management system or procedures (eg ISO 9000) that cover system auditing, then these may be used in place of these POSMS and POEMS

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procedures so long as ASEG is satisfied that they meet the same objectives.

10.1.4 Further guidance on the application of this procedure can be obtained from ASEG. The Institute of Environmental Management and Assessment (IEMA) and Institution of Occupational Safety and Health (IOSH) are professional bodies in environmental and safety auditing respectively and may produce useful information on auditing. (Further information can be found at <http://www.iema.net> & <http://www.iosh.co.uk> ).

**10.2 Aligning Safety and Environment**

10.2.1 The key alignment opportunity in this procedure is to plan safety and environmental audits together, where this is practical and beneficial.

**10.3 Guidance for ASEG**

10.3.1 In addition to completing sample audits of IPTs’ SMS and EMSs, ASEG should ensure that audits are performed that check ASEG’s compliance with those procedures that apply directly to it eg SSP01b, SSP02b, SSP03b.

**10.4 Warnings and Potential Project Risks**

10.4.1 If audits are not completed or are incomplete there is an increased risk that an IPT’s SMS or EMS does not achieve its objectives. This may lead to increased safety and environmental risks associated with the project. It may also lead to delays and cost impacts if shortcomings in the SMS and/or EMS are identified late, because rework may be required or approvals may be delayed.

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Form AAP01d/F/01 - Audit Report Template			
<b>IPT:</b>			
<b>Project(s) sampled during audit – title(s)/description</b>			
<b>Audit title and ref</b>			
<b>Audit dates:</b>			
<b>Audit client:</b>			
<b>Audit locations:</b>			
<b>Audit team:</b>			
<b>Completed by:</b>		<b>Date:</b>	
<b>Reviewed by:</b>		<b>Date:</b>	
<b>Audit scope, criteria and objectives:</b>			
<b>Description of approach and methodology:</b>			
<b>Audit findings:</b>			
<b>Areas of strength:</b>			
<b>Areas for improvement:</b>			
<b>Conclusions:</b>			
<b>Additional information:</b>			

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If appropriate and agreed with the Auditee, the following may also be provided	
<b>Audit limitations:</b>	
<b>Any unresolved issues between auditor/auditee</b>	
<b>Recommendations for improvement (if required by Audit client)</b>	
<b>Agreed follow up plans (if specified in the audit objectives)</b>	
<b>Annexes:</b>	Please indicate whether the audit report contains the following annexes – (If not included please indicate why)
<b>Audit team composition form:</b>	
<b>Audit team competency record form:</b>	
<b>Audit plan:</b>	
<b>Audit Pro-formas</b>	
<b>Non-conformance, Observation, Corrective and Preventive action forms</b>	
<b>Opening and closing meeting minutes</b>	

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<b>Additional information:</b>	
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<b>If appropriate and agreed with the Auditee, the following may also be provided</b>
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<b>Audit limitations:</b>	
<b>Any unresolved issues between auditor/auditee</b>	
<b>Recommendations for improvement (if required by Audit client)</b>	
<b>Agreed follow up plans (if specified in the audit objectives)</b>	
<b>Annexes:</b>	Please indicate whether the audit report contains the following annexes – (If not included please indicate why)
<b>Audit team composition form:</b>	
<b>Audit team competency record form:</b>	
<b>Audit plan:</b>	
<b>Audit Pro-formas</b>	
<b>Non-conformance, Observation, Corrective and Preventive action forms</b>	
<b>Opening and closing meeting minutes</b>	

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**0 SHOWING CONFORMANCE**

**0.1 Options**

0.1.1 There are three options to demonstrate conformance when applying this system procedure:

- a. Follow the defined system procedure using the recommended guidance and tools, including allowed variations and options.
- b. Use an equivalent process and tool set generated elsewhere and document evidence of procedural equivalence.
- c. Use an equivalent bespoke process and tool set for the project and document evidence of procedural equivalence.

**1 INTRODUCTION**

1.1.1 This procedure describes how IPTs should monitor and assess the performance of the safety and environmental management system(s), equipment and supporting activities (e.g. maintenance). The procedure thus covers both direct measures of safety and environmental performance (e.g. incident rates in service) and indirect measures (e.g. non-conformances in the Safety and Environmental Management Systems, late production of documentation).

1.1.2 Protocols for collecting safety and environmental performance data, (e.g. noise monitoring) and calibrating monitoring equipment may also be required.

**2 PROCEDURE OBJECTIVES**

2.1.1 To ensure that there are arrangements in place to monitor, measure, assess and document progress of the following:

- SMS and EMS implementation;
- Completion of objectives and targets and Safety and Environmental Management Plans;
- Completion of actions arising from non-conformance and observations;
- Completion of actions arising from Management Reviews; and
- Safety and environmental performance of equipment and supporting activities, (for example, priority environmental impacts and safety risks, compliance with legal and non-legal standards and adherence to operational controls).

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<b>3</b>	<p><b>RESPONSIBILITIES</b></p> <p><b>3.1 Accountability</b></p> <p>3.1.1 The IPTL is accountable for the completion of this procedure.</p> <p><b>3.2 Procedure Management</b></p> <p>3.2.1 IPTLs may delegate the management of this procedure to the IPT Safety and Environmental Focal Point(s).</p> <p><b>3.3 Procedure Completion</b></p> <p>3.3.1 IPT Safety and Environmental Focal Point(s), and/or contractor could be responsible for the completion of this procedure.</p>
<b>4</b>	<p><b>WHEN</b></p> <p>4.1.1 The applicability of this procedure is ongoing from the initial implementation of POSMS and POEMS to the end of the project</p>
<b>5</b>	<p><b>REQUIRED INPUTS</b></p> <ul style="list-style-type: none"> <li>a. Environmental Management Plan (<b>Form EMP06/F/02, Form EMP06/F/03</b>) and Safety Management Plan (outputs from SMP03);</li> <li>b. Operational controls (<b>Form EMP07/F/01</b> and outputs from SMP07);</li> <li>c. Non-conformance and corrective action records (<b>Form AAP04/F/01</b>);</li> <li>d. Safety and environmental communications (SSP01);</li> <li>e. Management Review Records (<b>Form AAP03/F/01</b>); and</li> <li>f. Performance data on equipment and supporting activities.</li> </ul>
<b>6</b>	<p><b>REQUIRED OUTPUTS</b></p> <ul style="list-style-type: none"> <li>a. Completed <b>Form AAP02/F/01</b> – Monitoring Schedule.</li> <li>b. Completed <b>Form AAP02/F/02</b> – Monitoring Data - Assessment Record.</li> </ul> <p><b>OR</b></p> <p>Equivalent actions and documentation that ASEG is satisfied achieve the same objectives.</p>

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<b>7</b>	<b>DESCRIPTION</b>
<b>7.1</b>	<b>Step 1: Identify elements to be monitored and assessed</b>
7.1.1	An IPT will identify the elements that will be monitored and assessed. This will include as a minimum the following: <ul style="list-style-type: none"> <li>• SMS and EMS implementation;</li> <li>• Progress against objectives and targets and Safety and Environmental Management Plans;</li> <li>• Progress of corrective or preventive actions produced from Non-conformances and Observations;</li> <li>• Progress of actions produced in Management Reviews; and</li> <li>• Safety and environmental performance of equipment and supporting activities (for example, priority environmental impacts and safety risks, compliance with legal and non-legal standards and adherence to operational controls).</li> </ul>
7.1.2	If an IPT believes there are other elements in addition to the above that should be monitored (e.g. roll out of training) then these should also be defined and documented.
<b>7.2</b>	<b>Step 2: Produce a Monitoring Schedule</b>
7.2.1	The elements of the SMS and EMS that the IPT has to monitor and assess should be documented. Information to be documented is as follows: <ul style="list-style-type: none"> <li>• Element to be monitored;</li> <li>• Frequency of monitoring data collection;</li> <li>• Frequency of monitoring data assessment;</li> <li>• Who is responsible for collecting the monitoring data</li> <li>• Who is responsible for assessing the monitoring data;</li> <li>• Data source (where the information is to be obtained from); and</li> <li>• Comparison requirements (e.g. comparison against legal compliance requirements, operational control requirements, objectives and targets).</li> </ul>
7.2.2	<b>Form AAP02/F/01</b> – Monitoring Schedule can be used to document the above information.
7.2.3	Various parties may be responsible for collecting safety and environmental monitoring data, depending on what data is required to be collected. For example as well as the IPT, this may also include Customer 2 and contractors. Monitoring data collected by Regulators and local authorities may also be utilised.
7.2.4	Where the monitoring schedule includes monitoring data which will be collected by parties outside of the scope of the SMS and EMS, for example Customer 2, the IPT can only request that the third party provides the information rather than demand it. It should be noted that equipment contractors would be classed as being within the

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scope of the SMS and EMS, if they were undertaking activities on an IPT behalf.

**7.3 Step 3: Produce measurement and calibration protocols**

7.3.1 In addition to the production of the monitoring schedule, it may be necessary to produce detailed monitoring procedures which set out how the monitoring data should be collected, eg noise monitoring.

7.3.2 Where monitoring equipment is used, it should be calibrated or verified at specified intervals, or prior to use, against measurement standards traceable to international or national measurements standards. If no such standards exist, the basis used for calibration should be recorded.

7.3.3 Where the activities described in this step may be performed by parties outside the scope of the SMS and EMS, for example Customer 2, the IPT can only request that they are carried out rather than demand it. Where the activities are being performed by contractors on behalf on an IPT, they will be classed as being within the scope of the SMS and EMS.

**7.4 Step 4: Collect monitoring data**

7.4.1 Monitoring data will be collected as defined in the Monitoring Schedule (**Form AAP02/F/01**).

**7.5 Step 5: Assess monitoring data**

7.5.1 At set intervals defined in the Monitoring Schedule (**Form AAP02/F/01**), the Safety and Environmental Focal Point(s) and other designated parties will assess monitoring data to establish actual performance against designed or required performance. Where non-conformances or observations are identified, these should be dealt with in accordance with AAP04 – Non-conformance and corrective action.

7.5.2 Other parties which may be involved in the assessment include the:

- Safety and Environmental Committee(s) (for example for large or complex projects);
- Equipment contractors or consultants where they have a notable role in the operation of the SMS or EMS, and/or
- IPTL.

7.5.3 An IPT may wish to combine this assessment with the Management Reviews (AAP03). This may not be suitable for large and/or complex projects.

7.5.4 **Form AAP02/F/02** - Monitoring Data – Assessment Record, can be used to document the result of the monitoring review.

**8 RECORDS AND PROJECT DOCUMENTATION**

8.1.1 Where relevant, the outputs from this procedure should feed into the following:

- a. Audit Schedules (**Form AAP01a/F/01**).
- b. Management Review (AAP03).

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8.1.2	c. Non-Conformance and corrective action (AAP04).  A copy of the information produced from following this procedure should be stored in the Project Safety and Environmental Cases as appropriate.
<b>9</b>	<b>RECOMMENDED TOOLS AND FORMS</b>  a. <b>Form AAP02/F/01</b> – Monitoring Schedule. b. <b>Form AAP02/F/02</b> – Monitoring Data – Assessment Record
<b>10</b>	<b>GUIDANCE</b>  <b>10.1 General</b>  10.1.1 JSP 375, 430, 438, 418, 454, 553 include some guidance on monitoring and measurement. The ISO14000 series is also useful, particularly ISO14001 and ISO 14004, and OHSAS 18001 and ISO 9001.  10.1.2 It may be beneficial in the assessment process to utilise formal techniques (e.g. trend analysis) in the process of reviewing performance and identifying areas for improvement.  <b>10.2 Aligning safety and environment</b>  10.2.1 The key alignment opportunity in this procedure is to monitor and review safety and environmental performance at the same time.  <b>10.3 Warnings and Potential Project Risks</b>  10.3.1 If monitoring and measurement is not carried out, it will not be possible to demonstrate that the SMS and EMS are achieving their aims of continual improvement. Not carrying out monitoring and measurement could also result in an increase in safety and environmental risks and impacts, and non-compliance with applicable standards and operational controls.

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Form AAP02/F/01 – Monitoring Schedule				
Project(s) Title				
IPT:				
Completed by:			Date:	
Reviewed by:			Date:	
Element to be monitored/assessed	Frequency of monitoring/assessment	Data source	Responsibility for monitoring/assessment	Comparison requirements

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Form AAP02/F/02 – Monitoring Data - Assessment Record			
<b>Project(s) Title</b>			
<b>IPT:</b>			
<b>Audit name and or reference no:</b>			
<b>Completed by:</b>		<b>Date:</b>	
<b>Reviewed by:</b>		<b>Date:</b>	
<b>Date of meeting:</b>			
<b>Location of meeting:</b>			
<b>Attendees:</b>			
<b>Minutes:</b>			

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0	<b>SHOWING CONFORMANCE</b>
0.1	<b>Options</b>
0.1.1	<p>There are three options to demonstrate conformance when applying this system procedure:</p> <ol style="list-style-type: none"> <li>a. Follow the defined system procedure using the recommended guidance and tools, including allowed variations and options.</li> <li>b. Use an equivalent process and tool set generated elsewhere and document evidence of procedural equivalence.</li> <li>c. Use an equivalent bespoke process and tool set for the project and document evidence of procedural equivalence.</li> </ol>

1	<b>INTRODUCTION</b>
1.1.1	It is important that the SMS and EMS are periodically reviewed by senior management within the IPT, to ensure their continuing suitability, adequacy and effectiveness.
1.1.2	The principle of continuous improvement is equally applicable to the performance of the IPT's SMS and EMS as it is to the safety or environmental performance of equipment projects.
1.1.3	<p>Although other reviews take place in the management systems (as shown below) these are detailed reviews, whilst management reviews examine the "bigger picture".</p> <ul style="list-style-type: none"> <li>• Monitoring and Measurement (AAP02)</li> <li>• Continuous Review (EMP08)</li> </ul>

2	<b>PROCEDURE OBJECTIVES</b>
2.1.1	To ensure the continuing suitability, adequacy and effectiveness of the SMS and EMS, through periodic reviews by senior management within the IPT.
2.1.2	To identify the need to make modifications or improvements to the management system.
2.1.3	To record the findings of management reviews.

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3	<b>RESPONSIBILITIES</b>	<p>3.1 <b>Accountability</b></p> <p>3.1.1 The IPTL is accountable for the completion of this procedure.</p> <p>3.2 <b>Procedure Management</b></p> <p>3.2.1 IPTLs may delegate the management of this procedure to the IPT Safety and Environmental Focal Point(s).</p> <p>3.3 <b>Procedure Completion</b></p> <p>3.3.1 The procedure will be completed by the IPTL, and other selected senior management within the IPT and the Safety and Environmental Focal Point(s).</p> <p>3.3.2 Where a contractor has a significant role in operating the SMS or EMS, relevant senior management from the contractor would also be involved in the completion of this procedure.</p>
4	<b>WHEN</b>	<p>4.1.1 This procedure applies as soon as the EMS and SMS is first implemented. The procedure will continue to apply until the end of the project(s) to which the SMS and EMS apply. As a minimum, an IPT will be expected to complete a management review before Initial Gate, Main Gate, the In-service Date and any Out of Service Date.</p>
5	<b>REQUIRED INPUTS</b>	<p>a. EMS documents and records (Outputs of EMP01-EMP08).</p> <p>b. SMS documents and records (Outputs of SMP01 – SMP13).</p> <p>c. Results of internal and external SMS and EMS audits (AAP01).</p> <p>d. Internal and external communications regarding the IPT’s SMS and EMS including suggestions for improvement (SSP01).</p> <p>e. Internal and external communications regarding the equipment’s safety and environmental performance, including complaints (SSP01).</p> <p>f. Any non-conformance and corrective action reports raised (<b>Form AAP04/F/01</b>).</p> <p>g. Record of Monitoring Reviews (<b>Form AAP02/F/02</b>)</p> <p>h. Previous management review meeting minutes (<b>Form AAP03/F/01</b>)</p>

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6	<p><b>REQUIRED OUTPUTS</b></p> <p>a. Completed <b>Form AAP03/F/01</b> – Record of Management Review.</p> <p><b>OR</b></p> <p>Equivalent actions and documentation that ASEG is satisfied achieve the same objectives.</p>
7	<p><b>DESCRIPTION</b></p> <p><b>7.1 Introduction</b></p> <p>7.1.1 It is not uncommon for Management Reviews to become lengthy and laboured, often due to the large amount of information being reviewed. It is very important therefore, that it is kept in mind that this is a <b>top-level</b> review, which should avoid going into fine detail, as detailed reviews take place in AAP02 – Monitoring and Measurement and EMP08 – Continuous Review.</p> <p><b>7.2 Step 1: Assemble Management Review Team</b></p> <p>7.2.1 The members of the Management Review Team should include, as a minimum, the IPTL and the Safety and Environmental Focal Point(s). Other senior management within the IPT can also be appointed to sit on the management review team and where considered appropriate, selected members of the Safety and/or Environmental Committee. Where appropriate parties sit on the Safety and/or Environment Committee, the Management Review may be completed by the Committee.</p> <p>7.2.2 Where a contractor has a significant role in operating the SMS or EMS relevant senior management from the contractor would also sit on the Management Review Team.</p> <p><b>7.3 Step 2: Agree Frequency of Management Review</b></p> <p>7.3.1 The frequency of management reviews will depend on the IPT or project concerned. For most IPTs an annual review period should be appropriate, and as a minimum reviews should take place every three years. The IPT will also be required to undertake a management review before Initial Gate, Main Gate, In-service Date and Out of Service Date, as a minimum.</p> <p>7.3.2 The frequency of reviews should reflect the complexity of the project, the project timescales and the degree of progress made with the SMS and EMS.</p> <p>7.3.3 For very large SMSs and EMSs it may be beneficial for the IPT to review different elements of the management system throughout the year, rather than cover all elements in one meeting.</p> <p><b>7.4 Step 3: Gather Documents and Evidence for the Review</b></p> <p>7.4.1 Once the scope and frequency of the review has been established, the documents and evidence to be considered by the Management Review Team should be compiled. This may include:</p>

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- a. EMS documents and records (Outputs of EMP01-EMP08).
  - b. SMS documents and records (Outputs of SMP01 – SMP13).
  - c. Results of internal and external SMS and EMS audits.
  - d. Internal and external communications regarding the IPT’s SMS and EMS, including suggestions for improvement.
  - e. Internal and external communications regarding the equipment’s safety and environmental performance including complaints.
  - f. Any non-conformance and corrective action reports raised **(Form AAP04/F/01)**.
  - g. Monitoring and measurement results/meeting minutes (AAP02)
  - h. Previous management review meeting minutes **(Form AAP03/F/01)**
- 7.4.2 It is likely that the Safety and Environmental Focal Point, with assistance from other parties as required, will be the most appropriate person to review the above and prepare the material to be presented and discussed in the management review.
- 7.4.3 The Safety and Environmental Focal Point should ensure that the Management Review Team is provided with the necessary information to allow it to assess the continuing suitability, adequacy and effectiveness of the SMS and EMS.
- 7.5 Step 4: Perform and Record the Review**
- 7.5.1 During the meeting the Management Review Team should consider and verify that:
- Actions identified in the last management review have been completed;
  - Comprehensive and effective audits are being carried out;
  - Actions to address non-conformances and observations are adequate and are being implemented on schedule;
  - The IPT/Project Safety and Environmental policy is still appropriate, (where one exists),
  - The SMS and EMS comply with POSMS and POEMS;
  - The IPT complies with MOD Safety and Environmental Policy;
  - The IPT complies with functional Safety and Environmental Policy defined in relevant JSPs.
  - Objectives and targets are still effective and on schedule;
  - SMS and EMS documents and records are adequate and complete;
  - The project is complying with relevant safety and environmental legal and non-legal standards;
  - Overall safety and environmental performance is acceptable;
  - Stakeholder expectations are being met; and

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- Sufficient resources are available for the effective operation of the SMS and EMS.
- 7.5.2 Other issues to discuss include pending changes to the IPT or project, and pending changes to safety and environmental legal and non-legal standards.
- 7.5.3 Where the need for modifying or improving the SMS or EMS has been identified, responsibilities and deadlines should be assigned against these.
- 7.5.4 The Safety and Environmental Focal Point should ensure that records of the management reviews are taken. **Form AAP03/F/01 - Management Review Form.**

**8 RECORDS AND PROJECT DOCUMENTATION**

8.1.1 Where relevant, the outputs from this procedure can feed into any element of the SMS and EMS, depending on where modifications, or improvements where identified as being required.

8.1.2 A copy of the information produced from following this procedure should be stored in the Project Safety and Environmental Cases as appropriate.

**9 RECOMMENDED TOOLS AND FORMS**

a. **Form AAP03/F/01 – Record of Management Review.**

**10 GUIDANCE**

**10.1 General**

10.1.1 It is possible to combine the management review and monitoring and measurement meetings, for example, when the project is particularly small, as long as all the elements required in both procedures are covered and the IPTL is present at the meetings.

10.1.2 It is also possible for the management review to cover more than one EMS or SMS. For example, if an IPT has implemented management systems within each project it supports, there may be a central review regime. This will be particularly useful where the projects are very small or similar.

10.1.3 Where the EMS and SMS are separate systems, the IPT may examine both within the same management review, if this will be of benefit to the IPT and would not reduce the quality of the review.

10.1.4 JSP418 Chapter 11 includes some guidance on Management Review. The ISO14000 series is also useful, particularly ISO14001 and ISO 14004, and OHSAS 18001.

**10.2 Aligning safety and environment**

10.2.1 The key alignment opportunity in this procedure is to undertake a review of both the

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SMS and EMS at the same time.

**10.3 Warnings and Potential Project Risks**

10.3.1 If the SMS or EMS ceases to be adequate and effective, the IPT risks increased safety and environmental liabilities arising from its project(s). This is clearly unacceptable under MOD policy and may lead to reputation damage, project delays or legal penalties.

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<b>Form AAP03/F/01 – Management Review Form</b>			
<b>Project(s) Title</b>			
<b>IPT:</b>			
<b>Completed by:</b>		<b>Date:</b>	
<b>Reviewed by:</b>		<b>Date:</b>	
<b>Date of meeting:</b>			
<b>Location of meeting:</b>			
<b>Attendees:</b>			
<b>Minutes:</b>			
<b>Actions to be taken</b>			
<b>What</b>	<b>Who</b>	<b>To be completed by</b>	
<b>Closure</b>			
<b>Completed by:</b>			
<b>Date:</b>			

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**0 SHOWING CONFORMANCE**

**0.1 Options**

0.1.1 There are three options to demonstrate conformance when applying this system procedure:

- a. Follow the defined system procedure using the recommended guidance and tools, including allowed variations and options.
- b. Use an equivalent process and tool set generated elsewhere and document evidence of procedural equivalence.
- c. Use an equivalent bespoke process and tool set for the project and document evidence of procedural equivalence.

**1 INTRODUCTION**

1.1.1 It is important that measures are put in place to ensure that gaps and deviances (known as non-conformances), in the operation of the SMS and EMS are identified and where necessary corrected, and prevented from recurring. It is also beneficial for measures to be put in place to capture and address areas of potential improvement which have been identified (Observations). Non-conformances and observations are equally important to the SMS and EMS documentation and records, as they are to the equipment's safety and environmental performance.

1.1.2 Non-conformances and observations are most likely to be identified by IPT staff, auditors and the equipment users, but may also be highlighted by external parties or become apparent through an accident or incident. It is essential that the IPT has a process for capturing details of the non-conformances and observations and using this to continually improve both the Management Systems' and the equipment's performance.

1.1.3 Further information on how this procedure interacts with other non-conformance system is provided in the Guidance section at the end of this procedure.

**2 PROCEDURE OBJECTIVES**

2.1.1 To ensure that gaps, inaccuracies and improvements in the IPTs' SMS and EMS, and equipment's safety and environmental performance are identified, reported and then investigated and recorded.

2.1.2 To ensure that corrective, preventive and improvement actions are planned, implemented and recorded.

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**3 RESPONSIBILITIES**

**3.1 Accountability**

3.1.1 The IPTL is accountable for the completion of this procedure.

**3.2 Procedure Management**

3.2.1 IPTLs may delegate the management of this procedure to the IPT Safety and Environmental Focal Point(s).

**3.3 Procedure Completion**

3.3.1 The diagram below shows the steps described in the Description section of this procedure against those parties or individuals that may be responsible for their completion.

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                graph TD
                    S1[Step 1 - Identify non-conformance or observation] --> S2[Step 2 - Investigate non-conformance or observation]
                    S2 --> S3[Step 3 - Recommended corrective, preventive or improvement action]
                    S3 --> S4[Step 4 - Decide action to be taken]
                    S4 --> S5[Step 5 - Review and update audit schedule]
            
```

Step 1 - Identify non-conformance or observation	}	Any party
Step 2 - Investigate non-conformance or observation	}	Safety and Environmental Focal Point(s) or other designated person
Step 3 - Recommended corrective, preventive or improvement action	}	Auditor, Safety and Environmental Focal Point(s), or other designated person
Step 4 - Decide action to be taken	}	Safety and Environmental Focal Point(s), manager of the area to which the action applies and Safety and Environmental Committee or other designated person
Step 5 - Review and update audit schedule	}	Safety and Environmental Focal Point(s) or other designated person

3.3.2 Where a contractor is responsible for operating part of the SMS or EMS, they will also have a role in the completion of this procedure. Where tasked by the IPT, the contractor can take on the role of the Safety and Environmental Focal Point(s) and subsequently operate the management system on behalf of the IPT.

**4 WHEN**

4.1.1 This procedure applies as soon as the IPT starts to implement its SMS or EMS, as non-conformances can surface as soon as the first elements of the management systems have been implemented. The procedure will continue to apply until the end of the project(s) to which the SMS and EMS apply.

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<b>5</b>	<p><b>REQUIRED INPUTS</b></p> <ul style="list-style-type: none"> <li>a. Results of internal and external audits (see AAP01);</li> <li>b. Internal and external communications regarding the IPT's safety and environmental management system(s), including suggestions for improvement. (See SSP01)</li> <li>c. Internal and external communications regarding the equipment's safety and environmental performance, including complaints. (See SSP01)</li> <li>d. Results of Monitoring and Measurement (See AAP02)</li> <li>e. Results of Management Reviews (See AAP03)</li> </ul>
<b>6</b>	<p><b>REQUIRED OUTPUTS</b></p> <ul style="list-style-type: none"> <li>a. Completed <b>Form AAP04/F/01</b> – Non-Conformance and corrective action record.</li> </ul> <p><b>OR</b></p> <p>Equivalent actions and documentation that ASEG is satisfied achieve the same objectives.</p>
<b>7</b>	<p><b>DESCRIPTION</b></p> <p><b>7.1 Introduction</b></p> <p>7.1.1 A non-conformance is a situation that does not comply with the requirements of one or more of the following:</p> <ul style="list-style-type: none"> <li>• POSMS, POEMS or functional safety management policy;</li> <li>• IPT's SMS and EMS;</li> <li>• Applicable safety or environmental legal and non-legal standards; or</li> <li>• Equipment safety or environmental performance.</li> </ul> <p>7.1.2 An observation can also be identified in the above areas. An observation is an identified improvement or need for improvement which does not relate to a conformance issues but may otherwise be of benefit. It can also be used to note good practice which may be of benefit to other parties conducting similar activities.</p> <p>7.1.3 The following steps define a system for identifying, reporting, investigating, actioning and recording non-conformances and observations.</p> <p><b>7.2 Step 1: Identify non-conformance or observation</b></p> <p>7.2.1 Non-conformances can be identified in a number of ways:</p> <ul style="list-style-type: none"> <li>• As a result of system audits (see AAP01) or equipment audits;</li> </ul>

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- As a result of accidents, incidents and near-misses;
  - From internal and external communications, including suggestions and complaints (see SSP01);
  - As a result of monitoring and measurement (See AAP02);
  - As a result of management reviews (See AAP03).
- 7.2.2 A non-conformance or observation can be identified and reported by a member of the IPT, internal or external auditors, Customer 2, contractors, regulatory authorities or members of the public. In fact, non-conformances or observations can be identified and reported by anyone who has a role or interest in the safety and environmental issues of the equipment.
- 7.2.3 When a potential or actual non-conformance is identified it must be recorded. **Form AAP04/F/01** – Non-conformance and corrective action record form can be used to do this. This records details of the non-conformance, including its severity and how it was identified, by whom and when. Non-conformances will be classified as either major or minor, as shown below:
- 7.2.4 Major non-conformance:
- An absence of control/system where they are required;
  - Where the control/system is in place but there are significant failings/inadequacies; \* or
  - Issue otherwise requiring urgent attention.
- 7.2.5 Minor non-conformance:
- Where the control/system are in place but there are non-significant failings/inadequacies; \* or
  - Where there is a minor breach of controls/procedures which could cause a problem if no corrective action to be taken
- \* where more than one failings/inadequacies are identified but are significantly related, these can be managed as one non-conformance
- 7.3 Step 2: Investigate non-conformance or observation**
- 7.3.1 Non-conformances will be investigated to establish whether there is potential for recurrence. This investigation will try to answer the following questions:
- What happened?
  - Why did it happen?
  - Who or what was responsible?
  - How serious was the actual and potential consequence(s)?
  - Could this happen again? If yes, how likely is this?

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- How could this situation be avoided in future?
- 7.3.2 The results of the investigation will be recorded on the **Form AAP04/F/01** – Non-conformance and corrective action record form.
- 7.3.3 Observations will be investigated to establish whether the identified area for improvement is justified and feasible.
- 7.3.4 The Safety and Environmental Focal Point(s) will normally undertake the investigations, or they may assign an alternative person to complete the task, for example, a person who works in the area where the non-conformance or observation has been identified.
- 7.3.5 Alternatively, an IPT may decide to ask ASEG, an independent safety consultant, or SME to undertake the work where assistance is required in the task, or where proving objectivity is important.
- 7.4 Step 3: Recommended Corrective, Preventive or Improvement Action**
- 7.4.1 The person who undertakes the investigation will identify one or more recommended course of action.
- 7.4.2 It should be noted that where a non-conformance or observation has been identified in a system audit, a recommended action may also be identified by an auditor. They may provide recommended actions without undertaking the investigation stage detailed in Step 2 above. In this case the Safety and Environmental Focal Point(s) may decide to undertake Step 2 above, before confirming the course of action to be taken.
- 7.4.3 It is possible to decide that no action will be taken in relation to observations, for example if it is considered not practical or cost effective to implement an improvement. Justification for all decisions taken is to be recorded.
- 7.5 Step 4: Decide Action to be taken**
- 7.5.1 The investigation will have identified one or more ways of mitigating and/or avoiding a recurrence of the non-conformance, or possible improvements to address an observation. This may include changes to SMS or EMS documentation, or operational control, or it may identify a training need.
- 7.5.2 It is not mandatory to undertake the recommended action when an alternative action can be identified. This particularly applies where actions have been recommended by auditors who have not completed the investigation stage prior to providing a recommended action. When deciding what corrective and preventive action will be taken, it is important to ensure that the action is proportional to the seriousness of the non-conformance.
- 7.5.3 Where the non-conformance applies to an area outside the IPT’s control, it is appropriate for an action to be raised regarding communicating the presence of the non-conformance to the party concerned. For example, where Customer 2 has not complied with a documented safety or environmental objective or operational control, it would be necessary to inform them of this. In this situation Customer 2 would be

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required to keep the IPT informed of progress in addressing the non-conformance (which would feed into AAP03 – Monitoring and Measurement), although auditing the effectiveness of the action would be outside the remit of the IPT.

7.5.4 The Safety and Environmental Focal Point(s) and the manager of the areas in which the non-conformance or observation was identified, will decide the action to be taken. For particularly sensitive or major non-conformances/observations it is recommended that the Safety and/or Environmental Committee(s) is involved in deciding, or endorsing the action to be taken.

7.5.5 Once appropriate actions have been identified and agreed, responsibility for ensuring that they are carried out must be assigned, along with a timetable for implementation. This can be documented in **Form AAP04/F/01 – Non-conformance and corrective action record form**.

7.5.6 For observations it is possible that no action will be taken, for example if it is considered not practical or cost effective to implement an improvement.

7.5.7 AAP02 – Monitoring and Measurement procedure will track progress of the decided action to be taken.

**7.6 Step 5 Review and update of documentation**

7.6.1 On completion of Step 4 above, the audit schedule (**Form AAP01/F/01 – Audit Schedule**) should be reviewed and modified to ensure that, checking the effectiveness of actions, is included in future audits.

7.6.2 Where the non-conformance was associated with an incident, accident or near-miss, then the Safety Hazard Log (SMP11) and/or Environmental Features Matrix (**Form EMP02/F/01**) should be reviewed and possibly revised, as it may be necessary to increase the probability rating, or to even insert the hazard if it was not identified already.

**8 RECORDS AND PROJECT DOCUMENTATION**

8.1.1 Where relevant, the outputs from this procedure should feed into the following:

- a. **Form AAP01/F/01 – Audit Schedule**;
- b. Management Reviews (See AAP03); and
- c. Monitoring and Measurement (See AAP02).

8.1.2 A copy of the information produced from following this procedure should be stored in the Project Safety and Environmental Case.

**9 RECOMMENDED TOOLS AND FORMS**

- a. **Form AAP04/F/01 – Non-conformance and corrective action record**.

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**10 GUIDANCE**

**10.1 General**

10.1.1 JSP 454, 430, 538 and 553 include guidance on non-conformance, corrective and preventive action. The ISO14000 series is useful, particularly ISO14001 and ISO14004, and also OHSAS 18001, ISO 19011 and ISO 9001.

10.1.2 It should be noted that JSP 442 – Accident Reporting System, covers the procedure which should be followed when reporting serious safety and environmental incidents, accidents or near misses. Where this procedure applies, the Accident Reporting Form shown in JSP 442 must be completed in addition to **Form AAP04/F/01** as the latter Form documents the completion of corrective and preventive action.

10.1.3 There may be other systems which must be followed in the event of an incident, accident or near miss, for example, D LOG (Strike) BP 1301 – reporting and Monitoring of Airworthiness matters and services occurrences. Where these systems cover all the issues documented in **Form AAP04/F/01**, there is no need to complete **Form AAP04/F/01**.

10.1.4 Where a safety and environmental non-conformance has been identified by Customer 2, details of the non-conformance, investigations completed and corrective and preventive action undertaken should be communicated to the IPT in order for it to review whether and how this affects the SMS and EMS.

10.1.5 Where the IPT has identified non-conformance associated with Customer 2, corrective, preventative action will generally involve the communication of the issue to Customer 2 for action, as they are outside the scope of the SMS and EMS and outside the direct control of the IPT.

**10.2 Aligning safety and environment**

10.2.1 The key alignment opportunity in this procedure is to ensure that both safety and environmental issues are considered when deciding upon corrective or preventive action. It is important to ensure that any safety implications of environmental changes are considered and vice versa.

**10.3 Warnings and Potential Project Risks**

10.3.1 If non-conformances are not recorded and responded to, there is a risk that they may reoccur. The outcome could be more serious next time, so near misses must be recorded, assessed and addressed.

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<b>Form AAP04/F/01 – Non-Conformance and Corrective Action Form</b>	
<b>Project(s) Title</b>	
<b>IPT:</b>	
<b>Non-Conformance or Observation</b>	
<b>Non-conformance/ Observation</b>	Major non-conformance / Minor non-conformance / Observation
<b>Details of the non-conformance/observation (including how identified):</b>	
<b>Identified by:</b>	
<b>Date Identified:</b>	
<b>Investigation (If appropriate)</b>	
<b>Completed by:</b>	
<b>Date:</b>	
<b>Details of investigation:</b> (e.g. Why did it happen? Who or what was responsible? How serious were the actual and potential consequence(s)? Any immediate corrective action already taken?)	
<b>What is the likelihood of this happening again?</b>	Not Possible / Unlikely / Likely / Very Likely / Almost Certain

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Recommended Corrective, Preventive or Improvement Action		
<b>Completed by:</b>		
<b>Date:</b>		
<b>Recommended corrective, and or, preventative action:</b>		
Action to be taken		
Action	Person responsible	Deadline
Closure		
<b>Completed by:</b>		
<b>Date:</b>		



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## 9. GLOSSARY AND ABBREVIATIONS

9.0.1 Note that for reasons of consistency and ease of reference, this section is common to both the POEMS and POSMS and therefore covers terminology and abbreviations used in both environmental and safety management.

### 9.1 Glossary

Accident	An unintended event, or sequence of events, that causes harm. [Def Stan 00-56 Issue 4].
Accident Sequence	The progression of events that results in an accident. [Def Stan 00-56 Issue 4].
Acquired Item	In the context of this manual, ‘acquired item’ refers to a capability being procured through the acquisition process. It is intended to differentiate between the system being procured and the safety management system.
Activity	The operations of an organization that are ‘large enough for meaningful examination and small enough to be sufficiently understood’. For example, vehicle maintenance.
ALARP	As Low As Reasonably Practicable. Used in reference to safety management. 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 Issue 4].
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 Issue 4].
Assurance	A statement, or process, intended to provide confidence on the condition or status of a system, process, activity, or materiel. Types of assurance include: <ul style="list-style-type: none"> <li>• <b>Regulatory Assurance</b> - A statement, or process, intended to provide confidence to a regulatory body on the condition or status of a system, process, activity, or materiel through a regulation or approval regime.</li> <li>• <b>Safety Assurance</b> - Part of Safety Management focused on providing confidence that adequate safety will be achieved and sustained.</li> </ul>

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Audit	<p>A systematic independent and documented process for obtaining audit evidence and evaluating it objectively to determine the extent to which the audit criteria are fulfilled. (ISO 19011) Types of audit include:</p> <ul style="list-style-type: none"> <li>• <b>First Party Audit</b> – An audit conducted by an organisation on the activities it has direct responsibilities for. (19011)</li> <li>• <b>Second Party Audit</b> – An external audit by a body or organisation having an interest in the activity or process examined, e.g. a customer or client. (19011)</li> <li>• <b>Third Party Audit</b> – An external audit by a recognised independent auditing organisation with no interest in the activity or process examined. (19011)</li> <li>• <b>Capability Performance Audit</b> – An audit of a capability or equipment system to provide assurance that the performance objectives or targets of the capability are being achieved.</li> <li>• <b>Combined Audit</b> – An audit the scope of which covers more than one management system operated by the organisation, or related to an activity, being examined. (19011)</li> <li>• <b>Compliance Audit</b> – An audit to provide assurance that a process, activity, or materiel is carried out or achieved in such a manner as to achieve compliance with legal, policy or other requirements; i.e. the audit criteria are restricted to compliance issues within the scope of the audit.</li> <li>• <b>Joint Audit</b> – An audit conducted by two or more auditing organisations. (19011)</li> <li>• <b>Management System Audit</b> – An audit the scope of which includes the process and procedures making up the whole or part of a formalised management system.</li> <li>• <b>Supplier Audit (pre contract)</b> – An audit conducted pre-award of a contract to provide assurance evidence that a supplier has management systems in place which can or do comply with MOD requirements.</li> <li>• <b>Supplier Audit (post contract)</b> – An audit of a supplier post award of contract to provide assurance that the goods or services being provided, or that a supplier’s management systems, are in conformance with MOD requirements.</li> </ul>
Audit Client	The person/project/IPT/organisation requesting the audit.
Audit Conclusion	Outcome of an audit, provided by the audit team after consideration of audit objectives and all audit findings (ISO 19011)
Audit Criteria	Set of policies, procedures or requirements (ISO 19011) against which a system process or material is audited
Audit Objectives	Statement(s) setting out the purpose and aims of the audit. These should be set by, or agreed with, the audit client and should form the basis for the audit scope and criteria.

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Audit Plan	Description of the activities and arrangements for an audit. (ISO19011)
Audit Programme	In relation to DE&S Acquisition Safety Environmental Management System (ASEMS) this audit manual together with the Audit Schedule forms an Audit Programme.
Audit Report	The written report supplied by the Lead Auditor to the Audit Client describing the audit, findings and conclusions.
Audit Schedule	Specifies the scope, frequency and timeframe for completing audits
Audit Scope	Extent and boundaries of an audit. (ISO19011)
Audit Team	Team of auditors, including a lead auditor, conducting an audit. May also include specialist matter experts (see SMEs) and trainee auditors.
Audit Trail	Series of linked and related questions asked, and the evidence produced, in order to ascertain compliance against a specific objective or to support the accuracy of data or claims. The questions and evidence making up an audit trail should be documented and the trail should be repeatable.
Auditor	Person with the competence to conduct an audit. (ISO19011) (see also Lead Auditor)
Availability	The ability of an item to be in a state to perform a required function under given conditions at a given instant of time or over a given time interval assuming that the required external resources are provided. [Def Stan 00-56 Issue 4].
Best Available Technique	A term used with reference to environmental management. The most effective and advanced stage in the development of activities and their methods of operation which indicates the practical suitability of particular techniques for providing in principle the basis for emission limit values designed to prevent and, where that is not practicable, generally to reduce emissions and the impact on the environment as a whole. [The Pollution Prevention and Control (England and Wales) Regulations 2000 SI No 1973].
Best Practicable Environmental Option	A term used with reference to environmental management. The outcome of a systematic consultative decision making procedure that emphasises the protection of the environment across land, air and water. [The Royal Commission on Environmental Pollution, 12th report, 1988].
Best Practicable Means	In this term, ‘practicable’ means reasonably practicable having regard among other things to local conditions and circumstances, to the current state of technical knowledge and to the financial implications. [Environmental Protection Act 1990].
‘Black Box’	Having visibility of only the externally visible performance and interfaces. [Def Stan 00-56 Issue 4].

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Broadly Acceptable	A level of risk that is sufficiently low that it may be tolerated without the need to demonstrate that the risk is ALARP. [Def Stan 00-56 Issue 4].
Cause	The origin, sequence or combination of circumstances leading to an event. [Def Stan 00-56 Issue 4].
Competence	Demonstrated personal attributes and demonstrated ability to apply knowledge and skills. (ISO19011)
Complex Electronic Equipment	An element of a system that is implemented in software or custom hardware. [Def Stan 00-56 Issue 4].
Consequence	The outcome, or outcomes, resulting from an event. [Def Stan 00-56 Issue 4].
Continual Improvement	In terms of safety:  Process of enhancing OH&S management system, to achieve improvements in overall occupational health and safety performances, in line with the organization's OH&S policy. [OHSAS 18001:1999].  In terms of environment:  Process of enhancing the environmental management system to achieve improvements in overall environmental performance in line with the organization's environmental policy. [EN ISO14001:1996]
Controlled Documents	Any documents forming part of the Safety or Environmental Management Systems that are subject to document control procedures eg Safety or Environmental Manual, System Procedures.
Counter Evidence	Evidence that has the potential to refute specific safety claims. [Def Stan 00-56 Issue 4].
Custom Hardware	Electronic components for which the design can be controlled or influenced by the Duty Holder or the Contractor. [Def Stan 00-56 Issue 4].
Demonstration Evidence	Evidence of the properties of a system, or an element of a system, achieved by testing, trials or operational execution. [Def Stan 00-56 Issue 4].
Direct Evidence	Evidence of the properties of a system, or an element of a system, that is obtained directly from testing analysis, experience of use or inspection of the system. [Def Stan 00-56 Issue 4].
Diverse Evidence	Evidence of the properties of a system, or an element of a system, that is based on mutually independent, but reinforcing, pieces of evidence. [Def Stan 00-56 Issue 4].
Duty Holder	A person with specific responsibilities for the safety management of the system. [Def Stan 00-56 Issue 4].

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Empirical Evidence	Evidence of the properties of a system, or an element of a system, that is based on experience or observation rather than theory. [Def Stan 00-56 Issue 4].
Enforcing Authority	The authority responsible for enforcing environmental legislation eg Environment Agency, local authorities.
Environment	Surroundings in which an organization operates, including air, water, land, natural resources, flora, fauna, humans and their interrelation.  NOTE: Surroundings in this context extend from within an organization to the global system. [EN ISO 14001:1996]
Environmental Aspect	Element of an organization's activities, products or services that can interact with the environment'.  NOTE: A significant environmental aspect is an environmental aspect that has or can have a significant environmental impact [EN ISO 14001:1996]  (For example, vehicle exhaust emissions.)
Environmental Case	A body of evidence that is compiled and maintained throughout the lifetime of a project on the environmental aspects and impacts
Environmental Case Report	A report that summarises the arguments and evidence of the Environmental Case, and documents progress against the environment programme. Note that in many cases this report may be the Environmental Impact Statement.
Environmental Feature Matrix	The matrix produced through following EMP02 and EMP04 which records material and energy inputs and outputs, the associated environmental impacts and the priority accorded to the impact.
Environmental Hazard	A threat to the environment posed by an environmental aspect.
Environmental Impact	Any change to the environment, whether adverse or beneficial, wholly or partially resulting from an organization's activities, products or services. [EN ISO 14001:1996]  For example, an increase or reduction in emissions to air of polluting gases as a result of transport operations is an environmental impact. Other examples include climate change, ozone depletion and river pollution.
Environmental Impact Assessment	Environmental Impact Assessment (EIA) is a process and management technique that can be applied to a project in order to identify all the environmental impacts produced by the project, their relative importance, and measures to eliminate or reduce any negative impacts identified.
Environmental Impact Assessment Plan	A document that details how and where the EIA process will be applied to a project.

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Environmental Impact Assessment Policy	The document that details the implementation of MOD-wide policy on Environmental Impact Assessment within DE&S.
Environmental Impact Assessment Report	The document which outlines the methodology, results and conclusions of an Environmental Impact Assessment.
Environmental Impact Screening and Scoping Report	A report produced after the initial identification of the environmental impacts associated with a project which includes reference to the information sources used to identify those impacts, an overview of the impacts, comment on which of the project stages will have the greatest impact, and which, if any, of these stages will be excluded from further assessment.
Environmental Impact Statement	The document which summarises the main points, results and conclusions of either an EISS Report or an EIA Report.
Environmental Issue	Issue for which validated information on environmental aspects deviates from selected criteria and may result in liabilities or benefits, effects on the assessee's or the client's public image or other costs." [ISO 14015:2001(E)]  For example, global warming, habitat loss, depletion of ozone layer.
Environmental Log	A file containing all information on the potential or actual environmental impacts of a project.
Environmental Management Plan	A document that outlines the actions identified by an organization in order to eliminate or reduce its environmental impacts.
Environmental Management System (EMS)	The part of the overall management system that includes organizational structure, planning activities, responsibilities, practices, procedures, processes and resources for developing, implementing, achieving, reviewing and maintaining the environmental policy. [EN ISO 14001:1996]
Environmental Panel	A group of individuals that have particular expertise relevant to the equipment system or project in question who can provide independent advice to the IPT on environmental issues related to the project.
Environmental Policy	Statement by the organization of its intentions and principles in relation to its overall environmental performance which provides a framework for action and for the setting of its environmental objectives and targets. [EN ISO 14001:1996]
Environmental Risk	A rating of the severity of an environmental hazard against the likelihood of its occurrence.
Environmental Standards	Any national or international environmental legislation, policy, agreement or initiative or any environmental policy commitment, strategy commitment or internal regulation that applies to an organization or to which an organization subscribes.

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Equipment System	In the context of this manual, ‘equipment system’ refers to a capability being procured through the acquisition process. It is intended to differentiate between the system being procured and the environmental management system.
Error	Discrepancy between a computed, observed or measured value or condition and the true, specified or theoretically correct value or condition. [Def Stan 00-56 Issue 4].
Evidence	Records, statements or facts or other information, which are relevant to the audit criteria and verifiable (ISO 19011)
Finding	Results of the evaluation of the collected audit evidence, against audit criteria
Harm	Death, physical injury or damage to the health of people, or damage to property or the environment. [Def Stan 00-56 Issue 4].
Hazard	A physical situation or state of a system, often following from some initiating event, that may lead to an accident. [Def Stan 00-56 Issue 4].
Hazard Analysis	The process of describing in detail the hazards and accidents associated with a system, and defining accident sequences. [Def Stan 00-56 Issue 4].
Hazard Identification	The process of identifying and listing the hazards and accidents associated with a system. [Def Stan 00-56 Issue 4].
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 Issue 4].
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 Issue 4].
Impact Priority Evaluation	The process of assessing identified environmental impacts in order to prioritise them for further action.
Incident	The occurrence of a hazard that might have progressed to an accident, but did not. [Def Stan 00-56 Issue 4].
Independent Safety Auditor	An individual or team, from an independent organization, that undertakes audits and other assessment activities to provide assurance that safety activities comply with planned arrangements, are implemented effectively and are suitable to achieve objectives; and whether related outputs are correct, valid and fit for purpose. [Def Stan 00-56 Issue 4].
ISO14001	The international standard for Environmental Management Systems.

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ISO14040	The international standard for Life Cycle Assessment.
Knowledge Base	A store of useful information on various topics, kept by ASEG for future reference.
Lead Auditor	Person recognised within the organization as having the required level of competence to manage and perform audits (See also Auditor)
Life Cycle Assessment	Compilation and evaluation of the inputs, outputs and the potential environmental impacts of a product system throughout its life cycle. [EN ISO 1440:1997].
Life Cycle Stages	The stages of acquisition through which a system passes ie CADMID.
Major non-conformance	An absence of control/system where they are required; where the control/system are in place but there is are significant failing/inadequacies; or issue requires urgent attention.
Material Risk	In terms of the EMS a material risk is something that has the capacity to effect any of the following issues:  Cost, including inflated cost of achieving efficient disposal – any risk that a financial budget may be exceeded is a material risk  Delays – any risk that project milestones such as the Initial Gate may be missed should be considered to be material  Legal penalties – any risk of incurring legal penalties is material  Reputation damage – any risk that may damage the MOD’s reputation is material  Environmental impairment – any risk that irreversible damage to the environment may be caused is a material risk.
Minor non-conformance	Where the control/system are in place but there are non-significant failing/inadequacies or where there is a minor breach of controls/procedures which could cause a problem if no corrective action to be taken
Mitigation Statement	A statement outlining the actions identified by an organization in order to prevent or control its environmental impact(s).
Mitigation Strategy	A measure that, when implemented, reduces risk. [Def Stan 00-56 Issue 4].
Nonconformance	Is a situation that does not comply with the requirements of one or more of the following: <ul style="list-style-type: none"> <li>• POSMS or POEMS;</li> <li>• IPTs’ SMS and EMS;</li> <li>• Applicable safety or environmental legal and non-legal standards; or</li> <li>• Equipment system safety or environmental performance.</li> </ul>

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Non-conformance and corrective action form	A document that records an observation or non-conformance, in addition to corrective, preventive and improvement action to be undertaken in relation to the observation and non-conformance.
Objectives	In terms of health and safety:  Goals, in terms of OH&S performance, that an organization sets itself to achieve. [OHSAS 18001:1999]. In terms of environmental performance, objectives are an overall environmental goal, arising from the environmental policy and the evaluation of environmental aspects, that an organization sets itself to achieve, and which is quantified where practicable.  In terms of environment:  Overall environmental goal, arising from the environmental policy, that an organization sets itself to achieve, and which is quantified where practicable. [BS ISO 14004:1996]
Observation	Where a possible improvement or need for improvement has been identified which does not relate to a conformance issue but may otherwise be of benefit
Occupational Health and Safety	(OH&S) – conditions and factors that affect the well being of employees, temporary workers, contractor personnel, visitors and any other person in the workplace. [OHSAS 18001:1999].
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 Issue 4].
Operational Controls	Any document, measure or system which contains elements that control an organization’s operations with the aim of avoiding or reducing one or more environmental impacts.
Performance	In terms of Health and Safety:  Measurable results of the OH&S management system, related to the organization’s control of health and safety risks, based on its OH&S policy and objectives. [OHSAS 18001:1999].  In terms of Environment:  Measurable results of the environmental management system, related to an organization’s control of its environmental aspects, based on its environmental policy, objectives and targets. [EN ISO 14001:1996]
Pre-Audit Questionnaire	Questionnaire supplied by the audit leader to the organisation to be examined. Usually requires basic information regarding the organisation, personnel, and the processes or activities it manages or has responsibility for. Will also identify documents or other records that the audit team will expect to consult during the audit.

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Procedure	A documented instruction which aims to ensure that the organization's environmental policy and its objectives and targets are met. These procedures will include: Environmental Management System core procedures, support procedures, assurance and audit procedures, operational control procedures and any overarching policy commitment procedures.
Process Evidence	Evidence of the properties of a system, or an element of a system, that is based on its development process. [Def Stan 00-56 Issue 4].
Project	In the context of this manual, 'project' refers to a single process that results in the acquisition of one or more equipment systems.
Qualitative Evidence	Evidence of the properties of a system, or an element of a system, that is not numerically based. [Def Stan 00-56 Issue 4].
Quantitative Evidence	Evidence of the properties of a system, or an element of a system, that is based on countable or measurable properties on a numerical scale. [Def Stan 00-56 Issue 4].
Receptor	Any organism or object that can be affected by a change in the environment eg humans, flora, fauna, buildings.
Regulatory Authority	The authority responsible for enforcing environmental legislation eg Environment Agency, local authorities.
Reliability	The probability of failure-free operation for a specified time for in a specified environment. [Def Stan 00-56 Issue 4].
Residual Risk	The risk remaining after risk reduction. [Def Stan 00-56 Issue 4].
Restricted Substance	Any substance that is controlled by law eg mercury, cadmium, PCBs.
Rigorous	Extremely thorough and accurate as well as strictly applied and followed. [Def Stan 00-56 Issue 4].
Risk	Combination of the likelihood of harm and the severity of that harm. [Def Stan 00-56 Issue 4].
Risk Acceptance	The systematic process by which relevant stakeholders agree that risks may be accepted. [Def Stan 00-56 Issue 4].
Risk Analysis	The systematic use of available information to estimate risk.
Risk and ALARP Evaluation	The systematic determination, on the basis of tolerability criteria, of whether a risk is broadly acceptable, or tolerable and ALARP, and whether any further Risk Reduction is necessary. [Def Stan 00-56 Issue 4].
Risk Estimation	The systematic use of available information to estimate risk. [Def Stan 00-56 Issue 4].

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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 Issue 4].
Risk Reduction	The systematic process of reducing risk. [Def Stan 00-56 Issue 4].
Safe	Risk has been demonstrated to have been reduced to a level that is broadly acceptable, or tolerable and ALARP, and relevant prescriptive safety requirements have been met, for a system in a given application in a given operating environment. [Def Stan 00-56 Issue 4].
Safety and Environmental Focal Point(s)	Is the person(s) who has been assigned with responsibility for overseeing the implementation and maintenance of the SMS and EMS within an IPT.
Safety Argument	A logically stated and convincingly demonstrated reason why safety requirements are met. [Def Stan 00-56 Issue 4].
Safety Audit	A systematic and independent examination to determine whether safety activities comply with planned arrangements, are implemented effectively and are suitable to achieve objectives; and whether related outputs are correct, valid and fit for purpose. [Def Stan 00-56 Issue 4].
Safety Case	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. [Def Stan 00-56 Issue 4].
Safety Case Report	A report that summarises the arguments and evidence of the Safety Case, and documents progress against the safety programme. [Def Stan 00-56 Issue 4].
Safety Claim	An assertion that contributes to the safety argument. [Def Stan 00-56 Issue 4].
Safety Committee (Safety Panel)	A group of stakeholders that exercises, oversees, reviews and endorses safety management and safety engineering activities. [Def Stan 00-56 Issue 4].
Safety Integrity Requirements	Safety requirements relating to properties of the system that contribute to resistance to dangerous failure, including (but not limited to) reliability, availability, robustness, timeliness and use of resources, as well as the degree of confidence in these properties. [Def Stan 00-56 Issue 4].
Safety Management	The application of organizational and management principles in order to achieve safety with high confidence. [Def Stan 00-56 Issue 4].

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Safety Management Plan	A document that defines the strategy for addressing safety and documents the Safety Management System for a specific project. [Def Stan 00-56 Issue 4].
Safety Management System	The organizational structure, processes, procedures and methodologies that enable the direction and control of the activities necessary to meet safety requirements and safety policy objectives. [Def Stan 00-56 Issue 4]
Safety Programme	The part of the Safety Management Plan that documents safety timescales, milestones and other date-related information. [Def Stan 00-56 Issue 4].
Safety Property	An invariant that is a necessary condition for a safety requirement to be met. [Def Stan 00-56 Issue 4].
Safety Requirement	A requirement that, once met, contributes to the safety of the system or the evidence of the safety of the system. [Def Stan 00-56 Issue 4].
Software	Intellectual creation comprising the programs, procedures, data, rules and any associated documentation pertaining to the operation of a data processing system. [Def Stan 00-56 Issue 4].
Stakeholder	Any individual or group concerned with or affected by the safety or environmental performance of an organisation.
Standards	Written specifications of the requirements of a process, system or material. Issued by standards Bodies eg ISO, BSI etc
Statutory Threshold	A maximum limit prescribed by law or legal permit for releases or emissions of particular substances to an environmental medium.
Sub- System	A system that is an element of another system. [Def Stan 00-56 Issue 4].
Subject Matter Expert (SME)	Person who has specific knowledge or expertise in a defined area. May be called upon to support the audit team.
Super-System	A system that includes at least one element that is itself a system. [Def Stan 00-56 Issue 4].
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 Issue 4].
System Platform	A piece of equipment that acts as the fixing point for another equipment system.

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Target	<p>Detailed performance requirement, quantified where practicable, applicable to the organization or parts thereof, that arises from the safety objectives and that needs to be set and met in order to achieve those objectives.</p> <p>In terms of environment:</p> <p>Detailed performance requirement, quantified where practicable, applicable to the organization or parts thereof, that arises from the environmental objectives and that needs to be set and met in order to achieve those objectives. [BS ISO 14004:1996]</p>
Tolerability Criteria	Quantitative or qualitative measures for determining whether a risk is unacceptable, tolerable or broadly acceptable. [Def Stan 00-56 Issue 4].
Tolerable	A level of risk that may be tolerated when it has been demonstrated that the risk is ALARP and is not unacceptable. [Def Stan 00-56 Issue 4].
Unacceptable	A level of risk that is tolerated only under exceptional circumstances. [Def Stan 00-56 Issue 4].
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 Issue 4].
‘White Box’	Having visibility of the internal architecture, structures, features and implementation as well as the externally visible performance and interfaces. [Def Stan 00-56 Issue 4].

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## 9.2 Abbreviations

AAP	Assurance and Audit Procedure
ALARP	As Low As Reasonably Practicable
AMP	Assisted Maintenance Period
ASEMS	Acquisition Safety and Environment Management System
ASEG	Acquisition Safety and Environmental Group
ATE	Army Training Estate
CADMID	An acronym describing the different phases of acquisition ie Concept, Assessment, Demonstration, Manufacture, In-service, Disposal.
CBA	Cost Benefit Analysis
CDM	Chief of Defence Materiel
CESO	Chief Environment and Safety Officer
CHASP	Central Health And Safety Project
COTS	Commercial Off The Shelf
CSA	Customer Supplier Agreement
DE	Defence Estates
DEFRA	Department of Environment Food and Rural Affairs
DESB	Defence Environment Safety Board
DESO	Defence Exports and Sales Organisation
DE&S	Defence Equipment and Support
DSA	Defence Sales Agency
DS&C	Directorate Safety and Claims
D SMT	Department of Specialist Management Training
DTI	Department of Trade and Industry
ECC	Equipment Capability Customer
EI	Environmental Impact

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EIA PM	Environmental Impact Assessment Policy Memorandum
EIR	Environmental Information Regulations 1992
EIS	Environmental Impact Statement
EISS	Environmental Impact Screening and Scoping
EMP	Environmental Management Plan
EMS	Environmental Management System
ESMB	Environment Safety Management Board
FSB	Functional Safety Board
FSMO	Functional Safety Management Office
HI&A	Hazard Identification and Analysis
HSC	Health and Safety Commission
IEA	Independent Environmental Auditor
IEMA	Institute of Environmental Management and Assessment
IG	Initial Gate in the CADMID cycle
IOSH	Institute of Safety and Health
IPT	Integrated Project Team (also used to cover Integrated Business Team)
IPTL	Integrated Project Team Leader
IS	In-Service
ISA	Independent Safety Auditor / Assessor / Advisor (according to context)
ISO14001	International Standard for Environmental Management Systems
ISO14004	Guidance on the International Standard for Environmental Management Systems
ISO14040	International Standard for Life Cycle Assessment
JSP	Joint Service Publication
LOD	Letter of Delegation
LoD	Lines of Development

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MG	Main Gate
MOTS	Military Off The Shelf
MOU	Memorandum of Understanding
NGO	Non Government Organisation
OCP	Operational Control Procedure
OH&S	Occupational Health and Safety
OHSAS 18001:1999	Occupational Health and Safety Management Systems - Specification
PFI	Private Finance Initiative
PHI&A	Preliminary Hazard Identification and Analysis
POEMS	Project-Oriented Environmental Management System
POSMS	Project-Oriented Safety Management System
PPP	Public Private Partnership
PR&A	Project Review and Assurance
RACI	Responsible / Accountable / Consulted / Informed (a technique to record, usually in a Table, the level of involvement of different authorities in a range of activities)
SEMI	(DE&S's) Safety and Environmental Management Instructions
SEMS	Safety Environmental Management System
SHEF	Safety Health Environment and Fire
SME	Subject Matter Expert
SMO	Safety Management Office or Officer
SMP	Safety Management Plan OR Safety Management Procedure
SMS	Safety Management System
SOP	Standard Operational Procedures (including Operational Procedure)
SofS	Secretary of State
SQEP	Suitably Qualified and Experienced Person(s)

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SRD	System Requirement Document
SSP	System Support Procedure
TLB	Top Level Budget
TLMP	Through Life Management Plan
UOR	Urgent Operational Requirement
URD	User Requirement Document
VPF	Value of Preventing a Fatality

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