Ministry of Defence

An Introduction to
**Environmental Management
in the MOD Acquisition Process**

Background

The role of the environment in defence is complex. Defence organisations are increasingly bound by national and international legislation and regulations to protect and conserve natural resources, and to act in an environmentally responsible manner.

It must be remembered that the role of defence organisations is to protect the security, independence and interests of the UK at home and abroad, and as such defence ministries and military personnel consider many aspects to ensure the capability to protect national and global security and alliance interests, environmental protection being just one.

Environmental problems are often dealt with retrospectively, after the damage has been done and at great cost. By introducing environmental considerations as part of the culture and overall management strategy it will help achieve effective environmental management without the sense that there has been an extra burden.

Environmental management does not have to unduly restrict the military by making regulatory compliance an overriding burden; it should be better viewed as an opportunity to save money, freeing it to be reallocated to operational activities. For instance, protecting the quality of land in training areas will ensure the availability of future training opportunities, and have financial benefits such as reducing energy costs and clean-up, disposal or litigation costs, and improve public relations.

Management of environmental issues applies throughout the entire life of a project, from concept to end of life disposal, and as part of this it is critical to apply formalised environmental management practices to the acquisition process to ensure adequate measures and appropriate controls are used.

The Sustainable MOD Strategy provides clear direction to address risks to our business and capabilities, which if made more sustainable, will enable us to be more efficient, resilient, and adaptable in the future.

Purpose

This booklet introduces the concepts, terms, and activities of effective environmental management within Defence Equipment & Support (DE&S) delivery teams in the role of acquisition. It is intended to enable delivery teams and other MOD employees, including those in front line commands and Operating Centres, to understand the main environmental issues and essential methodologies to control, minimise, and mitigate environmental impacts arising from the MOD's procurement decisions and products, services, and systems (PSS) through life.

Main changes for Issue 4

The aim of this issue of the Green Book is to update and invigorate current practices, to highlight future aspirations, and to make it more relevant to people in MOD with acquisition responsibilities.

It incorporates the changes to the way MOD undertakes environmental management through the Acquisition Safety and Environmental Management System (ASEMS) and its underlying Project Oriented Environmental Management System (POEMS).

Sustainable Procurement has now been included in the Green Book, to reflect how the MOD incorporates sustainable procurement into the acquisition process, including the reasons and potential benefits for doing so.

Suggestions for improvement should be sent to the DE&S Safety and Environmental Protection (S&EP) team. Contact details can be found on the ASEMS website (www.asems.mod.uk)

Issue 4.0

Environmental Management in the MOD Acquisition Process

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Key Messages

The MOD has moral, legal, and financial responsibilities for identifying and managing environmental impacts and risk.

Positive environmental outcomes are important to the MOD for its public reputation, operational flexibility, cost savings, and to ensure compliance with regulations and MOD policy.

The development of environmental management systems and processes allows the MOD to continually improve its environmental performance.

The activities and responsibilities of DE&S and front line commands are becoming ever more important in terms of delivery of environmental improvements within the MOD.

Operating Centres are responsible for providing assurance that all delivery teams within that Centre have appropriate environmental management arrangements.

Involvement of Heads of Capability is crucial to managing environmental impacts at the beginning of the CADMID/T cycle, where the greatest opportunity to mitigate environmental impacts lies.

1.1 The Environment and Environmental Change

The relative state of the environment has become an increasingly important issue over recent decades with global environmental concerns, such as the impact of greenhouse gas emissions and resource use, being the focus of political issues.

The industrial revolution, combined with population growth since 1900, has imposed unprecedented and unsustainable pressures on the natural world and the unsustainable consumption of resources. These are manifest in widespread degradation of the natural environment in ways that now affect every living creature. Degradation of the natural environment directly affects the human capacity to survive. To counter this trend, environmental legislation has been made increasingly stringent and far-reaching, a pattern set to continue as we become more knowledgeable about what causes environmental damage.

The environment can be an emotive subject. Some people regard any change to the natural world as unacceptable. To the more pragmatic, this view is impractical and an approach that is

sustainable would be considered more realistic as it balances economic growth, social pressures, and the environment into the decision-making process. All organisations impact on the environment to some extent, and the MOD is no exception. Environmental management is about taking a consistent and proportionate approach to identify significant areas of concern and to target effort where it will deliver the greatest benefit.

For the MOD, decisions made on environmental and sustainable procurement grounds must be balanced with other requirements such as operational capabilities and cost-effectiveness over the whole lifetime of a project. This approach is utilised by most organisations and is supported in UK and European law by concepts such as BPEO (Best Practicable Environmental Option), BAT (Best Available Techniques), and BPM (Best Practicable Means). Government and MOD Sustainable Procurement policies also aim to minimise environmental impact of government department procurement activities, setting minimum procurement standards for certain commodities.

Best Practicable Environmental Option (BPEO)

– is the outcome of a systematic and consultative decision-making procedure which emphasises the protection and conservation of the environment across land, air, and water. The BPEO procedure (as defined by the Royal Commission on Environmental Pollution (RCEP) in its Twelfth Report) establishes, for a given set of objectives, the option that provides the most benefit or least damage to the environment as a whole, at acceptable cost, in the long term as well as in the short term.

Best Available Techniques (BAT)

– are the available techniques which are the best for preventing or minimising emissions and impacts on the environment, as defined in the Environmental Permitting (England and Wales) Regulations 2016.

Best Practicable Means (BPM)

– refers to options that are both financially and technologically feasible, designed to prevent or reduce emissions and the impact on the environment as a whole. It can include such factors as the 'design, installation, maintenance, and manner or periods of operation for a plant and machinery or for the design, construction, and maintenance of buildings and structures'. BPM does not require disproportionate effort to the benefits likely to be derived, however the lack of finance is not considered a reasonable defence.

We now know that many activities that were once considered relatively benign have a significant impact on the natural world. As with numerous other issues, we have learnt that the environment is far more susceptible to damage from activities than was previously imagined. As environmental legislation has tightened and public perception has shifted, it has become unacceptable for individuals or organisations to needlessly pollute the natural environment. Organisations have also learnt that operating in an environmentally responsible manner reduces the use of resources, saves money, and often enhances their reputation and business performance.

People put great pressure on the natural environment. Activities such as changes in land use, exploitation of resources, changes in atmospheric concentrations, and pollution may cause irreversible change to both the local environment and the wider environment. The condition of the natural world, the environment in which we live, is vital to our continued existence. For example, plants supply virtually all our food directly or indirectly and are the primary source of medicine for at least three-quarters of the world's population.

1.2 Global Environmental Issues

Some of the most significant environmental issues include:

- Climate Change
- Global Warming
- Ozone Layer Depletion
- Natural Resource Depletion
- Pollution
- Waste Disposal
- Water Pollution, including Water Shortages
- Overpopulation
- Biodiversity Loss
- Deforestation, Desertification, and Soil Erosion

Climate change is caused by elevated levels of greenhouse gases in the atmosphere. Climate change is a significant global environmental issue with stringent legislative controls in place to improve the air quality through reduction and monitoring.

Due to the diverse nature of the MOD, there are a wide range of environmental issues to be considered when procuring and using a product, service, or system (PSS). Figure 1 is a visual representation of the potential environmental aspects and impacts associated with a typical piece of MOD land equipment. The identified aspects show how the vehicle interacts with its local environment, and the associated impacts show what effects the vehicle may have on the environment when in use.

Figure 1: Visual representation of potential environmental aspects and impacts associated with a typical piece of MOD land equipment

Aspects
Impacts

Non renewable resources used

Land contamination

Global warming, acid rain, risks to human health

Global warming

Acid rain

Risks to human health

Disposal to landfill

Use of metals, glass, plastics and hazardous materials

CO_2 SO_2 NO_X

Air emissions (SO_2, CO, NO_X, CO_2)

Exhaust gases

Non - renewable resources (Fuel)

Transportation of components and consumables

Fuel consumption

Using Non-renewable resources

Energy

Noise and vibration

Nuisance to people

Disruptive to nearby environment

An Environmental Aspect
– is described as 'an element of an organisation's activities or products or services that interacts or can interact with the environment' in BS EN ISO 14001:2015. A 'direct aspect' is one that we have control over such as an emission; and an 'indirect aspect' is something we have influence over but do not control such as in the supply chain.

An Environmental Impact
– is described as any change to the environment, whether adverse or beneficial, wholly or partially resulting from an organisation's environmental aspects (adapted from the definition in BS EN ISO 14001:2015).as the 'design, installation, maintenance, and manner or periods of operation for a plant and machinery or for the design, construction, and maintenance of buildings and structures'. BPM does not require disproportionate effort to the benefits likely to be derived, however the lack of finance is not considered a reasonable defence.

Global population growth and the resulting rise in demand for consumer goods in developed and developing nations is increasing demand for, and competition over, securing access to the materials which are used in manufacturing. This is often reflected in increasing commodity prices. There is a risk of materials being stockpiled or their export restricted for various reasons; in some cases, the situation is further compounded by production being concentrated in only a few countries. Some key metals and minerals used in defence equipment originate from regions where weak governance, instability, and violent conflict occur.

A material may be considered a risk to capability when it is essential and there is no alternative to it or where supply problems may be encountered. Acquisition projects should ensure that capability solutions are future-proofed against material security risks. Issues of materials security can overlap with issues concerning social and ethical considerations and hazardous substances.

1.3 Why is Environmental Management Important to the MOD?

The MOD recognises the value of protecting the environment and the need to demonstrate that it has put in place appropriate management processes to deliver continual and developing improvements, and to comply with legislation. Reasons for doing this include:

Legislation demands it – the MOD must operate within the confines of the law. Exemption from legislation may still be granted but only in circumstances where it is absolutely essential to maintain operational capability, or in the interest of National Security. The scope and demands of environmental legislation continue to increase, imposing stricter limits on negative impacts such as air emissions, effluent discharges, noise, and waste.

Some recent legislation directly affecting MOD supply chains is the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) Regulations 2010 for hazardous material and its use. The MOD is taking the stance that the REACH Regulations apply to the organisation and its suppliers' activities, unless there is a clear case for an exemption.

This is discussed in more detail in Section 2.2.

Public opinion expects it – public opinion is one of the key drivers to the establishment and implementation of laws and controls, especially in government. Today the environmental impact of all government procurement, including that of the MOD, is attracting an ever-increasing amount of public scrutiny.

The reputation of the MOD depends on it – a strong focus on environmental performance, particularly in purchasing practices, demonstrates to the public that the UK front line commands are paying attention to the consequences of its operations and activities. When public authorities fail to lead by example on this agenda their reputation tends to suffer.

Increased efficiency requires it – it is recognised that more efficient use of resources helps to reduce potential environmental impacts but also enhances business output and saves a great deal of money. Resource efficiency and greener business practices, such as using renewable energy, applying eco-design principles, recycling waste materials, or investing in a transport fleet that uses cleaner fuels, can deliver substantial cost savings to a project.

A good example of improving energy efficiency is Richard Branson's Virgin headquarters in London, which by using smart heating, lighting controls, and triple window glazing has reduced the business's electricity spend by 61 per cent per year. And the replacement of IT by 'thin client' technology consumes around 80 per cent less energy per year than existing IT equipment.

The U.S. Airforce F-16 aircraft uses several million rivets during maintenance operations that must be greased before insertion. The grease comes in tubes and must be stored in refrigerators. By purchasing pre-greased rivets, the US Air Force eliminated the environmental costs of disposing of empty tubes and the costs of cold storage, and saved an estimated $5 million and 24,000 person-hours per aircraft.

Local ecosystems and global cycles are preserved by it – the MOD acknowledges that it uses natural resources and that its activities have the potential to contaminate water, cause air pollution, disrupt and destroy natural habitats and give rise to land contamination. In addition to meeting its legal obligations, minimising impacts

benefits the MOD's business and efficiency as well as protecting local and global ecosystems.

MOD Policy insists upon it – the Secretary of State's 'Policy for Health, Safety and Environmental Protection in Defence' requires MOD to minimise adverse effects on the environment, comply with all applicable HS&EP legislation including overseas, and to protect the environment. It also states that where defence has exemptions, derogations, or dis-applications from HS&EP legislation, MOD maintain Departmental arrangements that produce outcomes that are, so far as reasonably practicable, at least as good as those required by UK legislation.

DE&S policy insists upon it – the Project Oriented Environmental Management System (POEMS) process forms part of the Acquisition Safety and Environmental Management System (ASEMS) which is mandated for all acquisition projects; POEMS requires compliance with government policy and stakeholder expectations about environmental risk. All DE&S delivery teams must adhere to the process and procedures, and comply with the principles of POEMS to ensure that they are compliant with both MOD and government policy.

> **An Environmental Risk** is defined in Def Stan 00-051 as an uncertain future event, either arising from an environmental aspect of defence activity or a change to the environment that could affect the Department's ability to achieve its objectives.

The Secretary of State (SofS) for Defence has overall responsibility for health, safety, environment and sustainable development policy throughout the MOD, which is detailed in DSA01.1 'Defence Policy for Health, Safety, and Environmental Protection'.

1.4 Why Manage Environmental Performance?

The MOD is a large organisation whose activities inevitably impact significantly on the environment. An adequate response to these issues requires a robust and methodical approach to identify potentially significant environmental impacts at the earliest possible stage in the acquisition cycle. Such a process helps procurement teams to design out environmentally damaging and unsustainable features (using processes such as design for the environment and BPEO) and to procure PSS with fewer impacts through life (sustainable procurement).

The failure to identify and assess environmental issues associated with PSS could involve:

- Delays to projects and PSS delivery – this could be due to changes in environmental legislation posing stricter emission controls resulting in PSS needing modification; this will ultimately result in the reduction of operational effectiveness in the MOD.

- Increase in costs – due to replacement of items or materials used in their construction.

- Delays in disposal – this could be due to contamination of waste routes, which will result in an increase in disposal costs.

Environmental performance can have a direct impact on the defence capability; an example would be if a warship was not able to operate or conduct exercises in waters because it did not meet the host nation's environmental legislation, as this will have a direct impact on its capability.

1.5 The Environmental Impact of MOD Procurement

DE&S is responsible for the procurement and support of PSS, therefore has a key role in ensuring that the PSS provided to MOD personnel is, and continues to be, environmentally fit for purpose. This is achieved by following a systematic process through the project life cycle of all PSS to ensure that the management of environmental issues is "built in" at the earliest opportunity.
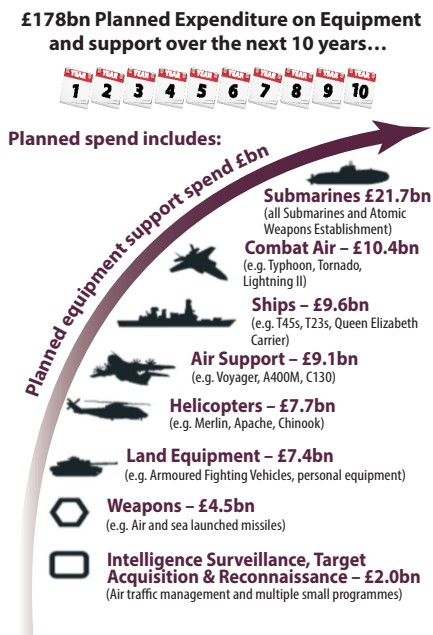
The MOD has a vital role to play in achieving both internal and UK government sustainable procurement targets which aim to minimise environmental impact of government department procurement activities and enhance environmental management within the acquisition cycle.

Sustainable procurement will enable the MOD to be more efficient, resilient, and adaptable to the future and is also critical to maintaining a defence capability. Climate change, resource depletion, and competition for energy have been identified as significant challenges to global stability and therefore national security. Understanding and adapting to these challenges is critical to delivering the defence capability and ensuring operational sustainability in the long-term.

To give an idea of the scale of MOD expenditure in the UK, the MOD has launched a 10 Year Equipment Plan every year since 2012. The 2015 edition set out the MOD's forecast expenditure plans to deliver and support the equipment required to meet the Armed Forces objectives, which amounts to £178Bn in the 10-year period 2015-2025. This is illustrated in Figure 2.

Figure 2: Planned Expenditure in MOD Equipment and Support

£178bn Planned Expenditure on Equipment and support over the next 10 years…

Planned spend includes:

Planned equipment support spend £bn

Submarines £21.7bn
(all Submarines and Atomic Weapons Establishment)

Combat Air – £10.4bn
(e.g. Typhoon, Tornado, Lightning II)

Ships – £9.6bn
(e.g. T45s, T23s, Queen Elizabeth Carrier)

Air Support – £9.1bn
(e.g. Voyager, A400M, C130)

Helicopters – £7.7bn
(e.g. Merlin, Apache, Chinook)

Land Equipment – £7.4bn
(e.g. Armoured Fighting Vehicles, personal equipment)

Weapons – £4.5bn
(e.g. Air and sea launched missiles)

Intelligence Surveillance, Target Acquisition & Reconnaissance – £2.0bn
(Air traffic management and multiple small programmes)

Source: MOD Equipment Plan 2015

To give an idea of the potential environmental aspects and impacts associated with a typical piece of MOD equipment at the different stages of the acquisition life cycle, Table 1 (page 14) considers a MOD land vehicle. The table shows both the environmental aspect and the potential environmental impacts likely to occur during each of the stages of the acquisition process from demonstration and manufacture, through in-service (in normal, abnormal and emergency conditions).

Disposal of waste arising from PSS use during the through life stages and at the end of life is a significant environmental impact faced by the MOD. Through life waste management requires storage, handling, and disposal that is compliant with legislation, while end of life disposal also requires close liaison with the Defence Equipment Sales Authority and other stakeholders to ensure that appropriate disposal options – such as resale, reuse, recycling, or landfill disposal – have been considered.

1.6 Roles and Responsibilities within DE&S

POEMS forms part of ASEMS which is mandated within DE&S for all acquisition projects and is underpinned by clear policy and guidance. It is the responsibility of everyone involved in the PSS to ensure environmental management activities are undertaken to achieve key environmental improvements from the earliest stage possible of the system life cycle. Early engagement will also enable the setting of good contractual requirements.

The Defence Safety Authority (DSA) is responsible for the regulation of defence health, safety, and environmental protection. It provides independent advice to the Secretary of State on health, safety, and environmental protection (HS&EP) policy in defence and evidence-based assurance that the policy is being promoted and implemented in the conduct of defence activities.

Table 1: Example of Potential Environmental Aspects and Impacts Associated with a Typical MOD Land Vehicle

Life Cycle Stage and activity	Activity Environmental Aspect	Possible Environmental Impact
Demonstration	Testing and trials	Fossil fuel consumption, production of waste, carbon emissions, noise
Manufacturing	Manufacture of components, assembly, transport to location where system will be in service	Energy use in manufacturing, fossil fuel consumption, production of waste, air/carbon emissions, resource depletion
In-Service/ Operation/ Normal	Transport of personnel and equipment, refuelling	Energy use, air/carbon emissions, possible spillages of oil/fuel when refuelling, noise, odour, dust and vibration
In-Service/ Operation/ Abnormal	Temporary deployment for civilian duties	Energy use, air/carbon emissions, possible spillages of oil/fuel when refuelling, noise, odour, dust, and vibration
In-Service/ Operation/ Emergency	Road traffic accident, fire or explosion	Land or water contamination through spillages of oil/fuel, air/carbon emissions from fire/explosion
In-Service/ Maintenance/ Routine	Routine servicing	Energy use, resource use, fossil fuel consumption, carbon emissions, waste disposal
In-Service/ Maintenance/ Deep repair/ upgrade	Replacement of worn or obsolete parts	Energy use, resource use, waste disposal, fossil fuel consumption, carbon emissions, hazardous waste disposal
Disposal	Sale of vehicle, recycling of components, disposal of vehicle components	Waste disposal, hazardous waste disposal

What can delivery teams do to manage the environmental impacts of acquisitions?

In general terms, the earlier in the purchasing process, even at the capability setting stage, you consider and incorporate environmental considerations, the greater the opportunity for intervention to manage, mitigate, or eliminate negative environmental impacts arising from that procurement activity. It is also simpler and cheaper to make modifications during the design phase of the PSS than it would be to recall, modify, and reissue that capability once it has been deployed.

Programme boards set the overall budget for each acquisition and must include in this allocation any provision required to mitigate environmental issues. It is essential that delivery teams identify environmental issues at an early stage so that these costs can be factored in accurately. Likewise, the main environmental requirements need to be set out clearly within the User Requirement Documents (URD) and System Requirement Documents (SRD) if the acquisition process is to fully integrate and address environmental concerns.

The application of the POEMS will help identify and clarify key environmental impacts. This in turn can help ensure that appropriate procedures are put in place at the key points of the Concept, Assessment, Demonstration, Manufacture, In-Service, and Disposal/Termination (CADMID/T) cycle to limit or manage potential problems and seek benefits. The POEMS assessment of a capability being replaced is a good benchmark from which to develop environmental improvement targets and metrics for its successor.

Delivery team leaders are responsible for ensuring that the appropriate competent personnel within their delivery team have been tasked with implementing the POEMS process. They are also responsible for managing environmental risk within their delivery team during acquisition, after which responsibility of residual risk acceptance will be owned and managed by the front line commands.

What can the front line commands do to manage the MOD's environmental impacts?

While DE&S delivery teams are responsible for implementing POEMS and managing the environmental impacts through acquisition, they have less control over the environmental impacts of the use of the PSS during training and in operations. They will rely on active stakeholders, such as the front line commands, to implement and deliver the Environmental Management System (EMS) actions on the ground.

When the responsibility for managing the use of the PSS and delivering environmental improvements transfers to a front line command, the delivery team provide support and advice when necessary.

Front line commands have influence on the use of the PSS and the behaviour of user personnel by implementing mitigation actions and managing the use of the PSS. The front line command's decisions and actions can expose the environment to risk, therefore they have a crucial responsibility in managing the environmental aspects and impacts of their activities, and should ensure that any EMS shortfalls are recognised, managed and corrected.

Front line commands have the responsibility to feed back to the relevant delivery team and/or Environmental Committee if there are any issues relating to the PSS, including changes to the intended use. They are also responsible for setting suitable and sufficient acquisition requirements at the concept phase that deliver environmentally acceptable outcomes.

Operating Centres

Operating Centres' key environmental responsibilities include liaison with the delivery teams to ensure that the information required for the POEMS is in place; and liaison with front line commands to ensure it is being communicated and implemented appropriately.

The Operating Centre also provides assurance to the DE&S Safety and Environmental Protection

(S&EP) Team that an adequate EMS is in place, and that there are appropriate arrangements for environmental management within the delivery teams that they cover.

Heads of Capability

The decisions of the Heads of Capability are crucial to setting good contractual requirements and managing environmental impacts. Their decisions on projects are made before or during the concept phase of the CADMID/T cycle, where the greatest opportunity to mitigate environmental impacts lies. The Heads of Capability are responsible for ensuring that environmental concerns are taken into consideration during the decision-making process from the outset, and as such will be fundamentally incorporated within a project.

Delegation of Environmental Tasks within MOD

DSA01.1 'Defence Policy for Health, Safety and Environmental Protection' provides strategic direction to all areas of the organisation responsible for the implementation of the MOD's environment policy. Each area has a system of 'letters of delegation' in place. These letters serve to formally delegate down the management chain the authority for implementing environment policy by carrying out safety and environment management tasks, and to define the scope of individual responsibilities. However, a letter of delegation is not a legal document and cannot transfer legal responsibility.

At the highest level, the delegation starts from the SofS. It will normally be passed down to individual delivery team leaders, project managers, or commanders. The DE&S Chief Executive Officer (CEO) delegates responsibilities and authorities to senior officers; detailing the flow of delegations down through the line management chain in the task of sub-delegating their respective responsibilities and authorities. Delegating officers should ensure that the scope of the authority and responsibility being delegated meets current and future business needs.

2 The MOD and Environmental Law

Key Messages

Environmental legislation has been made increasingly stringent and far-reaching, and will continue to do so as we become more knowledgeable about what causes environmental damage.

There are moral, legal, and financial reasons why MOD must strive to make its products, services, and systems (PSS) environmentally robust throughout the life cycle.

MOD and other UK employers have a legal duty to ensure that their activities do not cause environmental damage.

MOD activities are not immune from UK law, although where there is a clear case that complying with the legislation compromises national security, MOD may be justified in making use of disapplications, exemptions, or derogations that exist in legislation.

2.1 The UK Environmental Regulatory Culture

Much of the UK's environmental law takes the form of written statutes such as the Environmental Protection Act 1990 and the Environment Act 1995. These Acts give ministers powers to issue statutory instruments such as Orders and Regulations (known as secondary legislation) to tackle specific problems. Secondary legislation may itself be supplemented with guidance such as Codes of Practice or Circulars which, although not always legally binding, may sometimes also be given statutory status.

Organisations (and in some cases individuals) that infringe the provisions of environmental legislation can face criminal proceedings by a relevant enforcement agency. Conviction can lead to an unlimited fine or imprisonment for some environmental transgressions.

Much new environmental legislation in the UK results directly from European legislation in the form of regulations, decisions or directives which have been adopted in the UK. The UK regulatory culture is constantly moving to reflect changes occurring globally – it requires constant monitoring to ensure the changes are captured and understood.

Additionally, there is a body of common law – sometimes called the 'law of precedent' – built up over many years from decisions made by the courts. Delivery teams should be aware that it is possible for 'environmental' legal actions to be taken under common law, irrespective of the statutory context. In some cases, action under common law will be the preferred route, while in other cases it may be the only route available.

For instance, if someone was impacted by noise from MOD activities they might pursue an action for nuisance against the MOD under common law. Where a nuisance is proven to the satisfaction of the courts, then the remedy might involve a combination of:

- An injunction to restrict or prohibit the activities giving rise to that noise nuisance; and/or
- Financial damages based on the degree and nature of the interference caused.

The MOD may apply the argument of 'unavoidable on grounds of national security' to prevent an injunction, however it is unlikely to prevent the award of monetary damages.

2.2 The MOD's Position

The MOD is committed to complying with all environmental legislation and any additional requirements arising from international treaties and protocols to which the UK is a signatory. It aims to comply, whenever possible, with all Acts of Parliament as interpreted by the relevant regulations, rules and orders, except where it can demonstrate that it would be prejudicial to national security to do so.

The MOD no longer has immunity from prosecution, and cannot arbitrarily make itself exempt from legislation. However, many pieces of legislation do contain dis-applications, exemptions, or derogations (referred to in policy as 'DEDs'), which can apply to our products, services, and systems. These can mean that either our PSS is out of the scope of the legislation (it is disapplied), or it can be made exempt from compliance in specific circumstances, or the effects on it are reduced (derogated).

The MOD must follow the law, but can take advantage of these DEDs where it is justified. The 'Secretary of State's Policy Statement for Health, Safety and Environmental Protection' (HS&EP) states:

> *"Where Defence has exemptions, derogations or dis-applications from HS&EP legislation, we maintain Departmental arrangements that produce outcomes that are, so far as reasonably practicable, at least as good as those required by UK legislation."*

In general, this means that MOD should only seek to use a DED when it is in the interest of national security to do so and there is no reasonably practicable alternative.

The current top level MOD policy for environmental protection is DSA01.1 'Defence Policy for Health, Safety, and Environmental Protection', which amplifies the requirements of the secretary of state's statement. It is supported by companion documents in the DSA01 series to provide a working framework of guidance, implementation, and practices that apply to defence.

One example of legislation that impacts MOD activities is the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) Regulations 2010. These European regulations impose requirements on those who manufacture, market, or use chemical substances, substances in mixture and articles to be responsible for understanding and managing their risks. Anyone may be affected by REACH, either directly because of obligations imposed in the supply chain or indirectly because of withdrawal of products or restrictions for use of substances.

The MOD takes the stance that the REACH Regulations apply to the organisation and its suppliers' activities, unless there is a clear case for an exemption. As an end user the MOD has the responsibility to ensure that suppliers comply with REACH throughout the supply chain. However, the regulations do state that European Member States may allow for exemptions from REACH in specific cases for certain substances, where necessary in the interests of defence. UK regulations provide for the Secretary of State to make such exemptions by issuing certificates.

Delivery teams should be aware that a defence exemption is not a full exemption from meeting the obligations of REACH, but may be granted to prevent sensitive information entering the public domain. Exemptions are time limited and subject to regular review. It is the responsibility of the delivery teams to ensure that legislative and MOD policy is complied with, that information relating to the defence exemption is current and S&EP are notified of any changes that may affect the exemption. Failure to do so can lead to the exemption being withdrawn.

Waste management legislation is also important to MOD activities. As well as aiming to minimise the waste produced in the first place, the MOD must ensure compliance with regulations such

as the Environmental Protection (Duty of Care) Regulations (which concern handling and transport of waste) and Hazardous Waste Regulations. MOD waste may consist of hazardous components such as oils and heavy metals that are subject to these regulations. As such, delivery teams and front line commands should work closely with the Defence Equipment Sales Authority to implement appropriate waste management options.

The use of certain materials can also be restricted by legislation such as Directive 2011/65/EU on the Restriction of Hazardous Substances (RoHS) in Electrical and Electronic Equipment (EEE), which aims to reduce the risks to human health and the environment by restricting the content of certain materials in EEE. This Directive is currently dis-applied from equipment which is necessary for the protection of the essential interests of defence, including "arms, munitions and war material intended for specifically military purposes". Under the policy quoted above, MOD would expect its suppliers to comply with the intent of the RoHS Directive wherever reasonably practicable, and only use the disapplication when necessary. It is for MOD to decide whether an application is in the 'essential interests of defence'.

Environmental regulation can vary widely between countries and across continents. For example, parts of Asia, Africa, Central or South America and Eastern Europe have little or no environmental legislation, whereas the UK and USA regulate a wide range of environmental impacts.

The SofS for Defence's Policy Statement, September 2014 states:

> *"Overseas we apply our UK arrangements where reasonably practicable and, in addition, respond to host nations' relevant HS&EP expectations."*

It is the MOD's responsibility to educate itself with regards to relevant local environmental regulation and to ensure that it meets the relevant standards. It is also the MOD's responsibility to ensure that it is aware of any proposed or new legislation that may have an impact on their activities and to identify any future measures that may be required.

It can be anticipated that new policy initiatives, combined with increasing levels of regulation will be used to drive up environmental performance. This is likely to have a considerable impact across the whole of the MOD which will pose a major challenge, and will require regular monitoring.

Hazardous Substances and Restricted Materials

A Hazardous Substance is any substance or preparation which is toxic, harmful, corrosive or irritant, has a Workplace Exposure Limit (WEL), or any other substance that creates a risk to health because of its properties and the way it is used or is present in the workplace.

A Restricted Material is one that is banned or controlled by legislation but is still permitted for specific uses.

3 Managing Environmental Performance

Key Messages

System-specific environmental requirements set early in a project life cycle should drive the development to satisfy the needs of stakeholders.

Environmental management is most successful when there is good engagement with stakeholders from an early stage of the life cycle.

Environmentally responsible organisations save money, improve recruitment and employee retention, and enhance the reputation of an enterprise.

Environmental risk increases during times of conflict or abnormal situations caused by operating in less controlled circumstances when compared to training.

Meeting the principles of Sustainable Procurement better enables humans to thrive within the limits of the biosphere now and in the future.

Senior management commitment early in the development stage of an Environmental Management System is vital to ensuring success of the system and continual improvement of environmental performance.

An Environmental Management System (EMS) is a formal, structured approach to managing the aspects of a PSS that have, or could have an impact upon the environment. It affects business risk, customer and stakeholder satisfaction, product and process quality, and ultimately affects the bottom line.

The UK defence sector's environmental impact is significant due to the number of weapons, vehicles, aircraft and ships, as well as natural resources used. An EMS is the best way to both protect the environment and maintain operational readiness.

It is very important that all levels of management, in particular the top level, must be committed to the EMS, and all stakeholders must have clearly defined roles and responsibilities for the EMS to succeed in its intentions.

3.1 Setting Environmental Requirements

One of the most difficult elements of the environmental management process is setting the level of acceptable risk for the PSS in both peacetime and wartime.

The application of an assessment process such as BPEO to MOD systems is not straightforward, and individual projects will be guided by departmental environmental policy to develop and record their own justification for the targets and criteria which they use.

The BPEO approach can be used to establish the option that provides an acceptable level of environmental risk reduction, at an acceptable cost through life. If required, a cost benefit analysis can be used to support BPEO decisions.

BPEO is normally the best fit concept for exploring and justifying environmental decisions within the acquisition cycle. However, depending upon the acquisition in hand and the life cycle stage, other concepts might provide a better fit.

Part of an EMS is to identify and record the environmental requirements for the project. The environmental requirements should consider the influence of the operating context (or environment) on the consequences of environmental risks for the system. For example, the system may be part of a wider system of systems whose performance and ability to mitigate or prevent environmental consequences must also be considered.
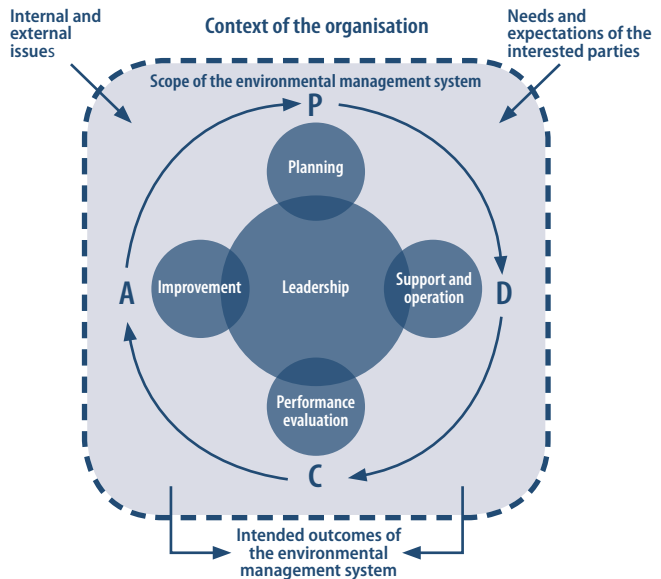
3.2 The Structure of an EMS

Part of an EMS is to identify and record the environmental requirements for the project. The environmental requirements should consider the influence of the operating context (or environment) on the consequences of environmental risks for the system. For example, the system may be part of a wider system of systems whose performance and ability to mitigate or prevent environmental consequences must also be considered.

An EMS is the preferred method for managing environmental impacts and risks. The main components of any management system can be summarised in the Deming 'Plan-Do-Check-Act' cycle shown In Figure 3.

This continuous cycle involves four steps:

- **Plan –** to determine scope of the management system during the initial phase, which will continually develop throughout the project life cycle (CADMID/T cycle).

- **Do –** to develop appropriate procedures and responsibilities to ensure that relevant issues are managed suitably.

- **Check –** periodic monitoring and checking to ensure the system is working efficiently, and during any major change to the system or its use.

- **Act –** establish appropriate measures to rectify any shortfalls and updating where circumstances change.

Figure 3: The Deming (PDCA) cycle in ISO 14001:2015

The structure of an EMS that conforms to the ISO 14001:2015 standard will closely align to the Deming Cycle and include all the checks required to ensure the system is relevant and operates effectively. The POEMS reflects the principles of the ISO 14001 approach.

The complexity of an EMS will be influenced by the scope of each organisation's activities and by the size, function, or role of the PSS. It must however include the following elements:

- An assessment of environmental issues linked to activities and performance.

- Setting performance objectives and targets within a programme of environmental action.

- Identifying legal and regulatory requirements, including standards and MOD policy.

- Identified responsibilities and procedures for the programme of environmental action.

- Periodic auditing of the EMS to ensure it works effectively.

To ensure success, senior management must also make a commitment, at an early stage in the development of an EMS, to continually improve and develop their organisation's environmental performance.

A context diagram provides a visual tool to help identify what stages are in and out of scope of an EMS. This is useful for legacy projects, where the initial stages of the CADMID/T cycle (Concept, Assessment, Demonstration and Manufacture) tend to be out of scope, while the last two stages, In-Service and Disposal or Termination will be in scope. An example context diagram is shown in Section 3.3.

There may be cases when the EMS is combined with the Safety Management System (SMS) to form a joint Safety and Environmental Management System (SEMS). This is usually for smaller projects to be both financially and administratively beneficial, as well as to avoid unnecessary duplication of information. The decision on whether to combine both rests with the individual delivery teams.

The MOD Acquisition Safety and Environmental Management System (see section 4) includes POEMS, the Project Oriented Environmental Management System, which gives a framework for establishing an EMS based on ISO 14001 that is tailored to the defence acquisition process.

3.3 Environmental Risk During Times of Conflict

As part of the acquisition cycle it is important to assess the potential environmental impacts associated with the use of military PSS in normal, abnormal and emergency situations, during intensive operations and on major exercises. When environmental management is applied to military operations, the aim should be to assess the likely environmental risks in advance and to have appropriate control measures and risk management integrated into military activities.

Environmental risks associated with equipment will increase in times of conflict or exceptional operation. Using refuelling at sea as an example of a 'normal' situation would be a refuel in good weather. The task becomes 'abnormal' when taking place in rough seas but may remain within specified guidelines even though there is a greater risk of spillage or leakage and a need for extra mitigation measures. In an 'emergency' scenario the risk of an uncontrolled release will rise substantially, especially where refuelling is interrupted by a pipe failure or an unexpected manoeuvre. Such foreseeable emergency situations.

Environmental impacts may not appear to be of great importance at the time, such as during emergency periods, but their aftermath can be of grave concern. It is vital that the likely

environmental impacts of any PSS are known before deployment, even if this PSS must be deployed regardless of those findings. Knowing such information at an early stage allows much better planning of possible mitigation measures including safe and efficient pollution clean-up activities.

environmentally sound for their intended military role, and with information to enable them to make good decisions when on operations. For military equipment, performance and reliability become part of the environmental characteristics when used operationally.

An example of delayed environmental impact is the HMS Royal Oak, which sank in 1939 in Scapa Flow, Orkney Isles from enemy action. At the time of sinking the vessel was loaded with a full complement of munitions and bunker oil. The exact amounts are unknown but it is thought that there were over 2,000 tonnes of heavy fuel oil contained in retrofitted tanks.

Since her sinking, the wreck has leaked small quantities of oil, and as the hull aged the leak increased prompting action to remove the remaining oil. A large proportion of the heavy fuel oil has been removed from the wreck to date via salvage operations. The wreck is no longer leaking into the environmentally sensitive waters of Scapa Flow due to containment measures that have been put in place. The vessel is undisturbed due to its designation as a war grave, and it is monitored by the DE&S Salvage and Marine Operations team.

Environmental Assessment is the assessment of the environmental aspects and impacts (both negative and positive) of a plan, policy, program, or project prior to the decision to move forward with the proposed action.

Calculating the potential environmental risk of equipment deployment at the acquisition stage is fraught with difficulty whether this occurs in peacetime or conflict. The severity of an impact can often be determined for a single incidence, but as the frequency of the impacts is unlikely to be known and usage will be determined by operational requirements, any assessment of significance may be difficult to accurately predict.

An environmental assessment should provide commanders with assurance that their systems are

It may only be possible when reviewing deployment scenarios to provide a qualitative rather than quantitative assessment. However, qualitative analyses can still provide sufficient information to enable the MOD and its suppliers to take better precautions to minimise environmental impacts.

Qualitative and Quantitative Assessment

Qualitative assessment is subjective, where the assessment uses knowledge, assumptions and professional judgement to provide an interpretation of the facts.

Quantitative assessment is objective, where the assessment undertaken uses measurements and statistics to establish a numeric result.

The user must be involved in discussions throughout the life cycle, from setting appropriate environmental requirements through to managing risk and feeding back information on changes of capability requirement, desired changes of use or problems in use, as it is the user community who will manage environmental risks in-service. It is vital that they provide realistic planning assumptions about how PSS will be used. Users are an integral stakeholder throughout the whole POEMS process, and must have a major role in defining and accepting what level of risk they will be prepared to tolerate for the benefits which the capability provides.

While the operational use of equipment will be the responsibility of the relevant front line command, much can still be done during the acquisition process to reduce environmental impacts and to provide information critical to the management of residual effects.

Environmental management is the MOD's principal risk reduction process to protect the environment, therefore it must be considered as a routine part of the planning process for operational missions.

3.4 Life Cycle Assessment

Life Cycle Assessment (LCA) is a formal process to assess the environmental aspects and impacts throughout the lifetime of a PSS. This cradle to grave approach prevents displacement of environmental impacts to a different stage in the life cycle. For example, pollution arising from the production process may be reduced by changes in raw materials but this must not increase the waste arising from usage or any other disposal impacts at the end of its life cycle. The LCA can be captured visually in a context diagram – a simple LCA context diagram is shown in Figure 4.

Even during the earliest stages of the life cycle, the impacts of later stages should be taken into consideration, especially in relation to end of life disposal. This will help to minimise disposal costs, and avoid unforeseen expenditure that may be required when disposing of PSS.

## 3.5 Circular Economy Principles

A circular economy is an alternative to a traditional linear economy (make, use, dispose) in which we keep resources in use for as long as possible, extract the maximum value from them while in use, then recover and regenerate products and materials at the end of each service life (BS 8001:2017 – Standard for Circular Economy).

As well as creating new opportunities for growth, a more circular economy will:

- ■ Reduce waste.

- ■ Drive greater resource productivity.

- ■ Deliver a more competitive MOD economy.

- ■ Position the MOD to better address emerging resource security/scarcity issues.

- ■ Help reduce environmental impacts within the MOD acquisition process.

Figure 4: Diagram of LCA approach – context diagram
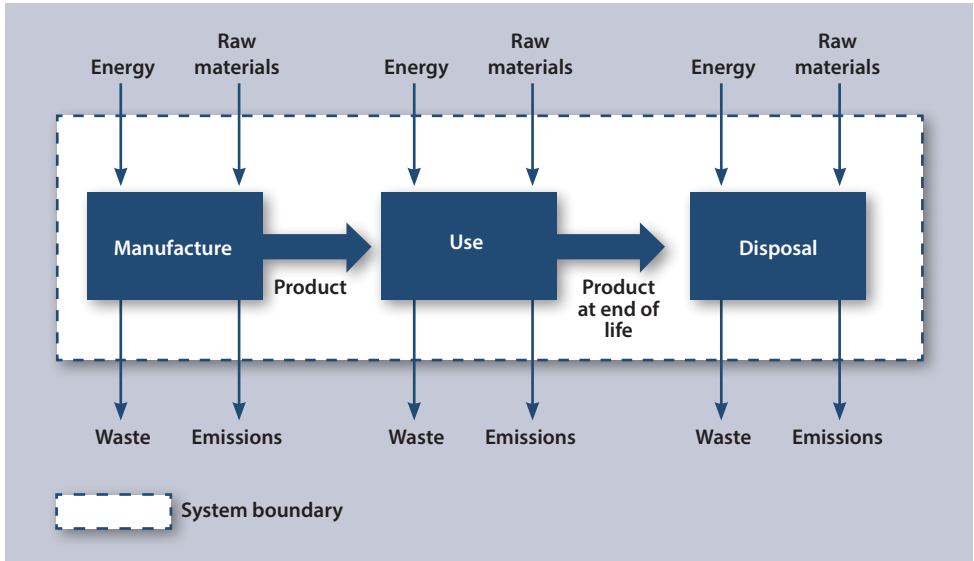
Common practices include:

- Utilise: use the procurement process to drive positive results such as end of life take back and re-commissioning (this can be considered an element of sustainable procurement).

- Regenerate: shift to renewable energy and materials – retain and reclaim.

- Share: maximise utilisation of products through peer-to-peer sharing of PSS.

- Optimise: improve the performance and efficiency of products; remove waste from their supply chains.

- Loop: keep components and materials in closed loops (controlling material inputs to maximise recycling and recovery of materials, minimise waste to landfill reducing the environmental footprint) and prioritise those you have direct control over. For finite materials,

this means remanufacturing products or components and, as a last resort, recycling materials.

- Virtualise: deliver utility virtually— documents/instructions, online facilities, autonomous vehicles, virtual reality and simulator training, and virtual offices.

- Exchange: replace old materials with advanced renewable ones; apply new technologies, such as 3-D printing, electric engines and additive layer manufacturing.

3.6 Design for the Environment

Design for the Environment focuses on incorporating design factors with environmental motives, to reduce environmental impacts. A Design for the Environment strategy aims to improve technology and design to expand the scope of products. By incorporating environmental improvements and considerations into the design process, Design for the Environment takes into consideration the entire life cycle of the product, while still making products usable but minimising resource use. Design for the Environment was introduced by the US Environmental Protection Agency (EPA) as a program of works to prevent pollution, and the risk pollution presents to humans and the environment. It has since been used worldwide.
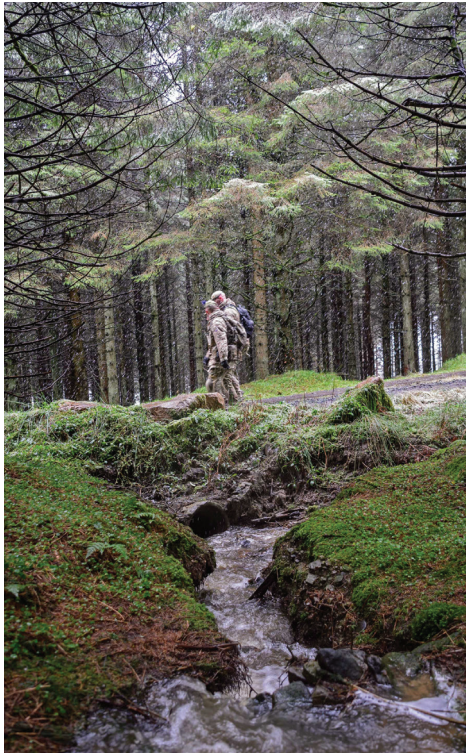
Commonly, Design for the Environment will include the following practices:

- **Design for environmental processing and manufacturing:** this ensures that raw material extraction (such as mining or drilling), processing (processing reusable materials, metal melting, etc.) and manufacturing are undertaken using materials and processes which are not dangerous to the environment or the people working on the processes involved. This includes the minimisation of waste and hazardous by-products, air pollution, energy expenditure and other factors, all of which can be influenced by the MOD setting environmental requirements at the contract stage.

- **Design for environmental packaging:** this ensures that the materials used in packaging are environmentally friendly, which can be achieved through the reuse of shipping products, elimination of unnecessary paper and packaging products, efficient use of materials and space, use of recycled and/or recyclable materials. One way the MOD can influence this is by requesting the supplier to take back all their packaging in the supply contract, or by requesting packaging capable of being burnt during active operations which is current MOD practice to reduce the unnecessary transport of waste.

- **Design for disposal or reuse:** the end of life of a product is very important, because some products emit dangerous chemicals into the air, ground and water after they are disposed of in a landfill. Planning for the reuse or refurbishing of a product will change the types of materials that would be used, how they could later be disassembled and reused, and the environmental impacts such

materials have. Reuse of items, such as batteries, could be achieved by ensuring that a common type is used on all pieces of equipment used in active operations, to reduce the types of waste requiring disposal and encourage reuse of the batteries in other equipment.

■ **Design for energy efficiency:** the design of products to reduce overall energy consumption throughout the product's life cycle. The MOD's Sustainable Strategy commits MOD to increase energy efficiency and reduce dependency on fossil fuels to lower the associated risks to business and its capability. Use of water purification plants in active operations would reduce the requirement for bottled water, thus reducing the amount of transport required and fuel used.

Typically, Design for the Environment considerations should be considered at the earliest stage possible of the CADMID/T cycle to ensure all environmental factors are considered for the PSS through life.

3.7 Including Environmental Protection in Investment Appraisals

An investment appraisal should be undertaken whenever a decision must be reached that would involve commitment of resources or deliver measurable benefits, to give a clear understanding of the costs and benefits of different choices throughout the life of the project. Because of the importance of environmental protection to government strategy, JSP 655 requires all investment appraisals submitted to the Investment Approvals Committee to consider environmental protection and interlinked sustainability issues such as economic and social impacts. Delivery teams will need to be prepared to support investment decisions with an environmental assessment of the relevant options that is commensurate with the scale, complexity, and sensitivity of the project or programme.

Key Messages

ASEMS is the mandated way of working within all DE&S delivery teams in acquisition projects for PSS.

The key aim of POEMS is to enable MOD acquisition teams to eliminate or minimise adverse environmental impacts while exploiting positive impacts, within the acquisition cycle.

Compliance with POEMS will ensure that any project's EMS is robust and proportionate to the project's levels of environmental challenge.

POEMS has great flexibility to be appropriately applied to different acquisition strategies, and to projects at different stages of the acquisition life cycle.

Sustainable Procurement (SP) is an integral part of POEMS and can be used to enhance environmental management activities.

The Environmental Committee provides the forum for decision-takers to hold environmental discussion with stakeholders, and obtain support, where necessary, from subject matter experts, and where decisions can be made.

4.1 MOD's Acquisition Safety and Environmental Management System (ASEMS)

The Acquisition Safety and Environmental Management System (ASEMS) is a mandated system across all DE&S acquisition projects, which provides a flexible system for delivery teams. ASEMS provides a consistent, proportionate and appropriate way to meet the requirements set within MOD ensuring the right outputs are delivered at the right stage in the acquisition cycle. Due to the flexibility of ASEMS, its manuals may be utilised by delivery teams, contractors, suppliers, and advisors where appropriate.

At the core of the ASEMS there are two systems manuals: the Project Oriented Environmental Management System (POEMS) and its safety equivalent, the Project Oriented Safety Management System (POSMS). Both systems contain instructions and guidance designed to assist delivery teams to demonstrate the implementation of effective and efficient environmental and safety management processes which satisfy legislation and departmental policy. The aim of ASEMS is to ensure that all appropriate precautions are taken to prevent harm to personnel and protect the environment, consistent with providing the operational capability required by the customers of DE&S.

Access to the POEMS and POSMS procedures is via the ASEMS website.

The MOD has already recognised the positive role of an EMS in managing and improving environmental performance. To help provide assurance on government purchasing, it is mandated within DE&S through ASEMS that an EMS approach is applied to all MOD's acquisitions to identify and manage potential environmental impacts and related risks through life.

An EMS make it possible to identify potential adverse or beneficial environmental impacts much earlier in the acquisition process making it possible to design potentially adverse impacts out of the PSS, or to mitigate such potential impacts though better management and control arrangements. In the same way, beneficial environmental impacts can be identified and enhanced as early as practicable in the procurement process.

4.2 The Project Oriented Environmental Management System (POEMS)

The POEMS has been structured to reflect the international EMS standard ISO 14001:2015 and the related ISO 14040 series on environmental LCA. It has been designed to align with the main stages of the CADMID/T acquisition cycle and to be a flexible framework capable of dealing with the vast range of procurement projects that delivery teams deal with, in terms of size of project, equipment complexity and the procurement strategy employed. It also enables key environmental impacts to be managed appropriately to deliver continuous improvement in environmental performance and reduce the environmental liabilities of its PSS.

The POEMS procedures enable delivery teams and others, such as Contractors, suppliers and advisors to:

- Identify and apply appropriate mitigation measures to reduce adverse environmental impacts to tolerable levels.

- Identify and manage any residual impacts.

- Exploit positive environmental impacts of acquisition projects.

- Set a benchmark for future acquisitions.

The scope of the POEMS is limited to acquisition and support projects for PSS. In implementing POEMS, the delivery team should identify the project boundaries as this determines what activities are in or out of scope of the project's EMS as well as identifying the relevant responsibilities. The POEMS outputs will inform the delivery team of the potential environmental impacts arising from PSS use, and any operational mitigation that should be implemented by the relevant end user.

The POEMS approach uses nine Environmental Management Procedures (EMPs) which follow the main structure of an EMS. The first five procedures determine the scope of the management system and develop appropriate procedures and responsibilities to ensure that relevant issues are being managed suitably. For most acquisition projects undertaking and applying the Environmental Impact Screening and Scoping (EISS) approach (EMP01-EMP05 and EMP09) throughout the life cycle of the project will suffice. Acquisition projects will proceed to further assessment as an Environmental Impact Management (EIM) approach (EMP06-EMP09) if there is either:

- One or more potential adverse environmental impacts identified; or

- Insufficient information to decide whether adverse environmental impacts exists;

  or

- Insufficient information to decide whether an environmental impact is adverse.

The POEMS approach has been developed to be consistent with current processes and procedures operated elsewhere within the MOD, the overview of the POEMS is shown in Figure 5 (taken from ASEMS).

Figure 5: The POEMS approach
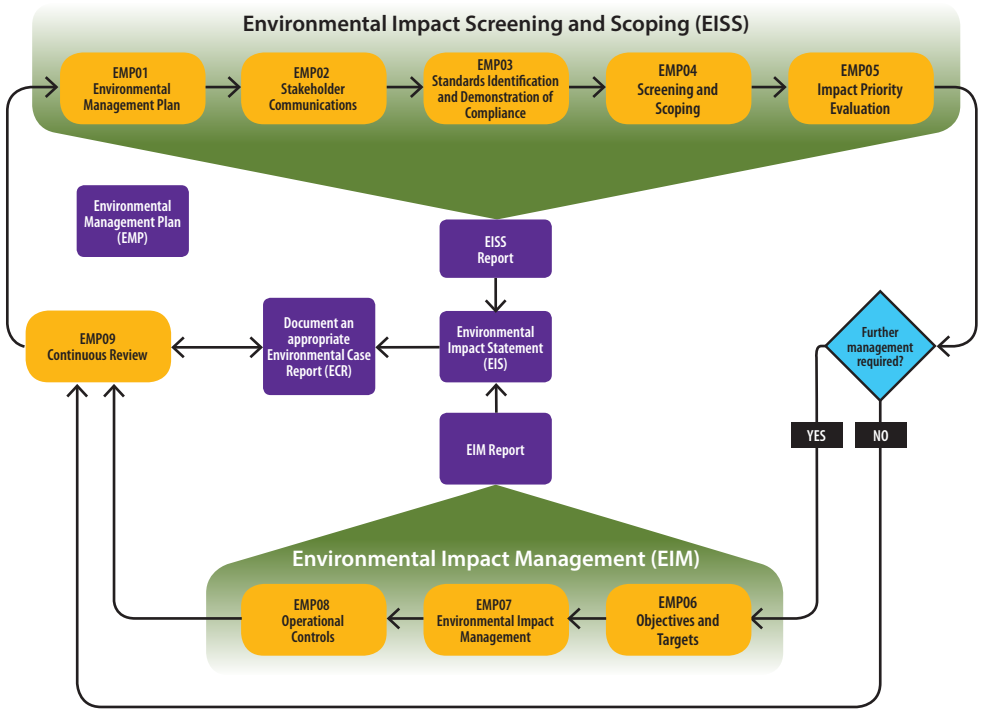
Part of the POEMS process is to develop an environmental features matrix (EFM) to collate and manage the identified aspects, impacts and potential risks of the acquisition at a specific point of a project which will be updated throughout the life cycle of the project. An example of a populated EFM is shown in Table 2 for a top-level activity during the In-Service stage of a capability's life cycle.

4.3 POEMS and Sustainable Procurement

Sustainable Procurement (SP) is an integral part of the POEMS process which provides a management system for a wide range of sustainability impacts and identifies opportunities for resource efficiency, emission reduction, environmental protection, and biodiversity enhancement in addition to the mitigation or elimination of the environmental risk. Careful consideration at the screening and scoping stage will show how all such issues can be captured. Most sustainable procurement impacts can be addressed within POEMS even if the impact is not normally considered 'environmental'.

Sustainable Procurement is the process where organisations meet their needs for goods, services, works, and utilities in a way that achieves value for money on a whole life basis. This includes generating benefits not only to the organisation, but also to society and the economy, while minimising damage to the environment.

Table 2: Example of a simplified environmental features matrix.

Activity	Aspect	Environmental Receptors							Impacts
		Human	Land	Water	Air	Flora	Fauna	Climate	
Operation / Traing	Noise energy/fuel use and emissions	✓	✓		✓	✓	✓	✓	Nuisance upon human / faunareceptors; use of non-renewable resources; indirect impact on air quality and loss of biodiversity
Maintenance	Effluent, energy use and emissions, material used			✓	✓	✓		✓	Use of renewable and non-renewable resources; indirect impact on air quality and loss of biodiversity
Storage	Energy use and emissions,				✓			✓	Use of non-renewable resources; indirect impact on air quality and loss of biodiversity
Transport	Noise ,fuel use and emissions	✓			✓			✓	Nuisance upon human / faunareceptors; use of non-renewable resources; indirect impact on air quality and loss of biodiversity
Administrative	Material use, energy use and emissions		✓		✓	✓		✓	Use of renewable and non-renewable resources; indirect impact on air quality and loss of biodiversity

The POEMS process performs a crucial role in ensuring that the MOD meets the environmental considerations of sustainable procurement to enhance environmental management within the acquisition cycle. For example, the outputs of an assessment undertaken during the Concept phase can inform sustainable procurement activities and consequently eliminate or reduce anticipated environmental impacts within the procurement cycle.

Sustainability risks are identified as a high priority within the MOD and they are linked to Strategic Defence Business Strategy Plans. The 'Sustainable MOD Strategy' is a key policy document which defines several key sustainability priorities fundamentally linked to MOD acquisition, such as resource management (energy and material

security), equipment longevity, supply chain sustainability, disposal costs and climate change issues.

ASEMS contains a sustainable procurement introductory guide and associated toolkit which can be used by delivery teams to embed sustainable procurement into their POEMS assessments.

4.4 Environmental Management Planning

Environmental management planning is an important and integral part of the POEMS which sets out the way in which the organisation intends to meet the identified environmental objectives and targets.

The Environmental Management Plan (EMP) will include:

- Description of the PSS.

- Concept of use, operation and operating environment, including the relationship with other systems and boundaries of use.

- Legal compliance arguments, including reference to the Environmental Policy to be met.

- Stakeholders and environmental responsibilities, including the delivery team structure.

- Anticipated significant environmental aspects.

- Objectives, targets, and communication.

- Key environmental management milestones.

- Assurance regimes.

- Competence.

- Other pertinent information.

The scope of the EMP shall be proportionate to the scale of the environmental challenge and should cover the current life cycle stage of the project but also include draft provisions for future stages; which will be updated as the project progresses. The EMP and the Safety Management Plan (SMP) will form part of the PSS's Through Life Management Plan. As disposal is an issue that arises throughout all the stages of a projects life cycle, the EMP should take into consideration the issue of through life disposal, as well as end of life disposal.

End of life disposal should be considered as early as possible at initiation of the project, with possible routes identified and subsequent financial, commercial, and environmental implications taken into consideration. Any financial funding requirements to cater for end of life solutions should be identified and communicated at the earliest opportunity.

4.5 Environmental Risk Assessment

An important POEMS process is the assessment of all the identified environmental aspects, impacts, and risks likely to arise from a proposed PSS, to determine which of these are significant to eliminate or control and manage them.

An environmental risk assessment looks at how the equipment is used and operated, and how it may interact with the environment (such as material use, emissions or waste) at a certain part of the life cycle. The assessment helps to identify the priority impacts and risks and enable mitigation measure to be put into place to mitigate or manage those identified, or maximise the positive impacts.

Within POEMS, to give a reasonable degree of variation between environmental impacts, five categories are to be used for both severity and frequency/duration, as shown in Table 3. This provides adequate variation and resolution to prioritise the environmental impacts for most projects, however it is recognised that in some circumstances a differ

Table 3: Risk assessment matrix used in POEMS

A High priority
B Medium priority
C Low priority

Example severity and frequency/duration criteria are defined in POEMS as:

Severity	Frequency/Duration
e Critical	**1** Occurs very rarely, short duration
d Severe	**2** Occurs annually, short/medium duration
c Major	**3** Occurs monthly, medium duration
b Moderate	**4** Occurs daily, medium/long duration
a Minor	**5** Occurs continously, long duration

a. **Minor** – Low to medium use of renewable resources or low use of non-renewable resources. Non-hazardous waste produced and recycled, or small amounts disposed of as inert waste. Notable but minor environmental impact, negligible but widespread. For example, temporary disturbance or minor damage to habitat of common species only.

b. **Moderate** – Moderate to large use of renewable resources. Notable non-hazardous waste disposal, hazardous waste (in Scotland, special waste) recycled, small amounts of hazardous waste disposal. Environmental impact limited to a small area, or widespread impact with no or minimal lasting damage. For example, permanent damage to habitat of common species only.

c. **Major** – Significant use of non-renewable resources, limited use of toxic substances. Notable amount of hazardous waste produced. Notable lasting environmental damage. For example, destruction of habitat of common species or temporary damage to habitat of endangered species.

d. **Severe** – Large scale use of non-renewable resources, significant use of toxic substances. Large amount of hazardous waste produced. Large scale environmental damage with national significance, e.g. release of gases contributing to acid rain (NOx, Sox), or permanent damage to habitat of endangered species.

e. **Critical** – Large scale use of scarce resources or toxic resources e.g. use of heavy metals. Very large amount of hazardous waste produced. Severe widespread irreversible environmental damage of international significance e.g. large scale release of greenhouse gases, release of ozone depleting substances or destruction of habitat of endangered species.

It is important to remember that if an environmental risk has the potential to impact on safety or risk to life then this risk should be raised to the safety committee for consideration of inclusion into the safety hazard log and managed appropriately.

4.6   Environmental Committee

Environmental management is most successful when the decision-makers have good engagement with stakeholders from an early stage of a project.

An Environmental Committee provides the forum for decision-takers to hold environmental discussions with stakeholders, and obtain support, where necessary, from subject matter experts (SMEs). The committee should include representatives from all areas that have environmental responsibilities for the PSS, typically consisting of:

- Delivery team personnel (such as the project environmental manager and other technical, finance, and contracts officers as required).

- Head of Capability SMEs.

- Front line command (user) SMEs.

- Regulators.

- Trials team (if appropriate).

- Maintenance specialists (if appropriate).

- Prime Contractor and/or Design Authority.

- Specialist advisors (from industry, MOD, or independent environmental specialists).

- ndependent environmental auditors (IEA), if required by the project.

Front line commands have a key role in the Environmental Committee since they have the detailed knowledge of how the PSS will be used in-service. It is therefore essential that they are represented at an appropriate level to bring relevant operational experience and to have the necessary authority for any decisions that must be taken.

The Environmental Committee should co-ordinate the development and management of the EMP, develop environmental requirements, and progress the production of the Environmental Case. The committee will continue to support each PSS throughout its life cycle, although it can be beneficial to group together similar PSS under one committee to reduce duplication. It should be started ideally at project initiation to ensure that environmental aspects are correctly considered and integrated into project activities at the earliest opportunity.

The delivery team and front line command may decide to have a combined Safety and Environmental Committee or to have the Environmental Committee as a sub-committee to the Safety Committee for smaller projects, as this will enable collaboration of the management of both environmental and safety risks,

The members and Terms of Reference of the Environmental Committee should be documented as part of the POEMS process.

4.7 Environmental Monitoring and Audits

Monitoring, audit and feedback is a cyclical process of learning and continual improvement, and can be used to improve environmental performance.

Monitoring activities can be both active and reactive, with methods such as:

- Incident reporting, investigation, and feedback – reactive.

- Environmental reviews and audits – active.

- Safety and Environment working groups and committees - active and reactive.

- Suggestion schemes which cover environment – active.

Monitoring regimes and audits are not just there to identify problems, they can also be used to share good practice between projects and lead to improvements throughout the delivery team, the Operating Centre and DE&S.

An audit can be used to ensure that the EMS is being properly applied within the project. It can be an internal audit, or for a larger, high risk project it may be appropriate to have an Independent Environmental Auditor to provide an external objective view not affected by internal external factors. Audit findings, including non-conformances, are part of the agenda for the Environmental Committee where decisions can be made to address the findings. Lessons learnt and feedback are key to providing information for development and improvement measures within a project.

Incident reporting, including near misses, provides a direct measure of the performance of the PSS in actual use, which is vital for understanding actual environmental risk and forecasting potential environmental risk.

5 Environmental Issues in the Acquisition Life Cycle

Key Messages

Environmental assessment is an iterative process within the overall development of the system.

Environmental assessment draws on a range of available techniques to identify and understand possible environmental risks.

Possible environmental risks must be identified and understood so that they can be eliminated or controlled.

Environmental risk identification is most effective when done systematically by a team of people with knowledge about the system, its design, and environment.

Before a project comes into service, the emphasis of environmental management is on influencing the development of the project to eliminate environmental risk and enhance environmental benefits at the earliest possible opportunity.

When a project is in service, the environmental management is principally concerned with controlling residual or remaining environmental risks.

Different environmental issues arise throughout the system's life cycle, and their management and mitigation requires a variety of approaches and skills, including good communication between all the relevant stakeholders. This section looks at these issues and indicates what should be done and when.

The CADMID/T acquisition cycle, which is the MOD's project life cycle model, is usually represented as a sequence of discrete stages however elements of the cycle can take place in parallel rather than series. For instance, disposal activities occur throughout the whole life cycle as well as the whole system disposal at the end of its life.

5.1 What is done and when?

Environmental management activities differ throughout the life cycle of a project. Initially the emphasis of environmental management is on influencing the development to eliminate environmental risk and enhance environmental benefits of the project, as early consideration can significantly reduce the cost of incorporating effective controls to reduce environmental impacts. Once a system comes into service, environmental management is principally concerned with controlling residual or remaining environmental risks.

The MOD acquisition life cycle is described in detail in POEMS, and consists of the Concept, Assessment, Demonstration, Manufacture, In-service, and Disposal or Termination (CADMID/T) phases. Each phase has a linear approach, with a clear start and finish phase, on which the project has clear progression to the next stage. The MOD acquisition life cycle is shown in Figure 6.

Most PSS purchased by the MOD will pass through the CADMID/T life cycle. As it is likely that different environmental impacts will arise for each of these stages, it is important to consider environmental impacts through the whole lifetime of the equipment. This approach ensures that all relevant issues are considered at the appropriate time. For legacy PSS, this process may take place for the first time during the In-Service stage.

Figure 6: The MOD Acquisition Cycle

| Concept | Assessment | Demonstration | Manufacture | In-service | Disposal/Termination |

Pre-Qualification Questionnaires (PQQ) or Invitations to Tender (ITT) are informed by the outputs of the POEMS process and allow the delivery team to include environmental issues when engaging with Industry, providing an opportunity to obtain information from the supply chain regarding their environmental performance and their understanding of environmental issues. This information can then be used by the delivery team to score and rank each bidder, with those performing better environmentally obtaining a higher score for their tender. In this way, the MOD will encourage the supply chain to become more environmentally aware as well as building better environmental performance and solutions into the project from the start.

In addition to requests for information during PQQ and ITT, the delivery team should consider embedding environmental management considerations (relating to the more significant environmental challenges) within contract specifications, contract conditions, and contract management and performance requirements. These requirements set by MOD are now contained in a MOD Defence Standard for environmental management requirements (Def Stan 00-051).

This section examines each of the CADMID/T stages and considers how environmental considerations should be incorporated.

5.2 Concept

This stage of the acquisition cycle is where the delivery team establishes whether the capability gap identified by the front line command can be met. Ideally, this should be when environmental issues are first considered. This first environmental assessment is an important step as it may highlight opportunities to eliminate environmental impacts from other stages in the life cycle. For example, it may be possible to reduce or avoid the use of restricted substances during manufacture, or to design components for a new PSS that are easily recycled during the disposal stage.

Improvement in environmental performance is key with new PSS, so it is important to make use of existing information on similar equipment at the concept phase to provide evidence and comparisons.

By the end of the Concept phase most significant environmental aspects, impacts and potential risks throughout the life cycle of the system will have been identified, addressed or managed within the

project, and the financial aspect will be committed. Equally it is during this phase that there are major opportunities for reducing or eliminating environmental risk and enhancing environmental benefits. The main environmental outputs from the Concept stage will be:

- Preliminary Environmental Case Report (ECR), including environmental aspects, impacts and risks identification.

- A conclusion on whether the capability requirement can be achieved without excessive environmental risk.

- Environmental sections of the user requirements document.

- An EMP for subsequent phases of the project.

- Environmental Committee established.

- Initial identification of relevant stakeholders.

- Initial record of relevant legislation and other standards.

- Draft EFM.

For a project with a high risk profile or likely to have interest from external stakeholders, the delivery team may wish to include a preliminary Environmental Impact Statement (EIS) as part of the Environmental Case for use as a public consultation document.

Initial Gate is the first approval point in a project's life cycle and occurs before any assessment work is undertaken. The level of detail at the Initial Gate stage should be proportionate to how much information is known at the Concept phase. Identification of potential environmental impacts at the early stages of Initial Gate approvals can allow for avoidance or mitigation of any issues to be accounted for before moving onto the next step in the CADMID/T cycle.

Tips on how to apply POEMS to new projects or those in the early stages of CADMID/T

- Commence POEMS application as early as possible, preferably starting in the Concept stage.

- More can be achieved by influencing design than can ever be done by abatement techniques added retrospectively.

- Ensure environmental concerns and issues have been incorporated within the decision-making process of the project from the start, use POEMS to ensure the URDs and SRDs incorporate relevant key environmental objectives and requirements.

- Identify and liaise at an early stage with stakeholders that may have environmental concerns relating to the capability.

5.3 Assessment

This stage of the acquisition life cycle is aimed at agreeing the design options for the PSS by comparing competing designs from the Concept stage to choose the most suitable and viable option. Although this assessment will focus on how well the PSS meets the user's operational and cost requirements it will also consider environmental issues.

An assessment will be undertaken for each suggested design option that considers environmental impacts and risks throughout the PSS's lifetime, including its potential operating geography, possible emissions and material usage, and disposal. Once identified, the potential impacts and risks should be prioritised according to the POEMS methodology, including positive aspects.

If further information is required to establish whether an option is more or less environmentally damaging than another, this should be recorded and followed-up.

The main environmental outputs from the Assessment stage will be:

- An ECR for each design option that prioritises the options in terms of environmental aspects, impacts and risks, including consideration of disposal issues.

- Environmental Impact Management (EIM) approach (where appropriate).

- Environmental objectives and targets for inclusion within the system requirements document.

- EFM.

- An EMP for subsequent phases of the project.

- Outline of any further assessments or information needs.

At Main Gate, a more robust Environmental Case is required which removes any uncertainties during the Assessment phase, and should identify how potential environmental risks will be mitigated, and/or what steps are in place to manage environmental risks that cannot be eliminated. Identification of potential environmental impacts at the early stages of Main Gate approvals can allow for avoidance or mitigation of any issues to be accounted for before moving onto the next step in the CADMID/T cycle.

5.4 Demonstration

At this stage of the acquisition life cycle the final design for the system will have been agreed and commissioned. This stage will include obtaining any outstanding information to finalise the design option, and any missing information will become recommendations for further stages in the life cycle.

The potential environmental impacts and risks identified during the assessment phase should be reviewed, and updated where necessary, and the EMP updated accordingly.

The main environmental outputs of the Demonstration stage will be:

- nput to the design process to influence environmental impact (for example through eco-design or material substitution).

- Demonstration stage ECR for the chosen design option.

- Evidence that the environmental targets are being / will be met.

- An updated EMP.

- Draft Operational Control Procedures.

- EFM.

5.5 Manufacture

During this stage of the acquisition life cycle, the emphasis in terms of environmental considerations should be on ensuring that the manufacturing process follows any agreed design choices and meets any performance criteria agreed in the EMP.

During the manufacture stage further testing or assessment may be undertaken to ensure the environmental performance of the PSS, and revision may be required to the proposed operational control procedures or the EMP. These documents will then be used in the development of training programmes, monitoring and measurement regimes and maintenance programmes for the PSS.

The main environmental outputs of the Manufacture stage will be:

- ■ A full system / manufacture stage ECR.
- ■ Results of verification tests.
- ■ Further evidence that the environmental objectives and targets are being met.
- ■ Verification of user and maintainer environmental documentation and training.
- ■ An updated EMP.
- ■ EFM.
- ■ Operational Control Procedures.

There are instances where the MOD rely on off-the-shelf procurement of equipment where they have little or no influence over the manufacturing stage, however the MOD can request the supplier's information on environmental performance and define environmental requirements within their contract of supply.

5.6 In-Service

Once the PSS is at the in-service stage the main objective is to ensure that the PSS meets any agreed objectives and targets for environmental performance, which requires close liaison and cooperation with all stakeholders involved. Incidents or near-miss reports should be monitored to ensure that the environmental implications are recorded and actions are put into place to avoid any repeat occurrence, including activities such as revision of operational control procedures, changes to maintenance programmes or further training requirements. It is also important to consider the in-service disposal requirements of the PSS (such as munitions, maintenance items) to ensure there are adequate disposal routes available through life.

Most current MOD projects lie within this stage of the CADMID/T cycle as they are legacy equipment, which are an ongoing capability used by the MOD. Therefore, for legacy equipment the delivery teams should:

- ■ Identify and manage the environmental impacts and risks.
- ■ Identify the stakeholders for all the remaining life cycle stages of the project.
- ■ Consider the environmental standards to which the equipment must conform to maintain legislative compliance.
- ■ Review planned disposal arrangements for the equipment.
- ■ Review Learning from Experience (LFE) data.

The main environmental outputs of the in-service stage will be:

- ■ In-service ECR, including updates when the system is modified or there are changes in how it is being used or operated.
- ■ Updated Operational Control Procedures.

- Influence of the design process for improved environmental performance if there are modifications or upgrades to the system.

- An EMP for changes and final disposal.

- EFM.

- Draft Disposal Plan.

- Continuous environmental improvement through incident investigation and environmental audits, including audit reviews based upon the risk profile of the project.

A mid-life upgrade (MLU) could be anything from a small technical insertion improving the efficiency of a capability, to a major refit, for example, of a naval vessel. Depending on the scale of the upgrade and to what extent the POEMS has been applied to the original capability, the approach taken to apply the POEMS process will vary and it may be appropriate to revisit the whole Environmental Case.

5.7 Disposal / Termination

This stage of the acquisition life cycle is concerned with the final disposal of the PSS which will be carried out in accordance with the Disposal Plan. The term 'disposal' in this context means 'the way in which the capability ceases to be the responsibility of the MOD' and therefore includes the termination or gifting of a capability.

Final disposal should be considered at the earliest life cycle stage possible to ensure a suitable disposal route is available. The Defence Equipment Sales Authority is a key stakeholder for disposal therefore early liaison with them will ensure that the PSS is appropriately managed, either for resale/reuse, recycling and/or landfill or other disposal.

The main environmental outputs of this stage will be:

- ECR for the disposal programme.

- Finalised Disposal Plan.

- Inventory of Hazardous Materials (IHM).

An example of key environmental activities and outputs throughout the MOD acquisition life cycle is given in Table 4.

Tips on how to apply POEMS to MLUs

- Identify to what extent POEMS has been applied to the original capability and undertake a gap analysis to establish how the upgrade will affect the capability.

- For major MLUs a complete refresh of the POEMS documentation may need to be considered.

- For technical enhancements and insertion projects where POEMS has already been applied, consider a review of the existing system and the potential for an annex for the MLU.

Table 4: An example of key environmental activities and outputs throughout the acquisition life cycle

ACQUISITION LIFE CYCLE MODEL

	Concept	*INITIAL GATE*	Assessment	*MAIN GATE*	Demonstration	Manufacture	In-Service	Disposal
Environmental Activities	• Agree environmental requirements for the URD • Identification of stakeholders and standards • Identification of likely environmental aspects and impacts • Identify assumptions and constraints		• Environmental Impact Assessment to compare design and procurement options • Refine environmental requirements for SRD		• Input to the design process to influence environmental impact • Finalise design issues and agree final design option • Agree monitoring and measurement programme	• Monitor manufacture to ensure compliance with any identified objectives and targets • Further evidence that the environmental objectives and targets are being met • Verification of user and maintainer environmental documentation and training	• Continuous environmental improvement through incident investigation and environmental audits • Identify preventative action • Influence the design process for improved environmental performance if there are modifications or upgrades	• Dispose of equipment in accordance with Disposal Plan
Environmental Outputs	• Preliminary ECR • Environmental section of the URD • Initial EMP • Environmental Committee established • Draft EFM		• ECR for each design /procurement option • Environmental section of the SRD • Environmental objectives and targets • EMP • Identification of information gaps or required information • EFM		• Evidence that the environmental targets are being / will be met • Demonstration Stage ECR • EMP • Draft Operational Control Procedures • EFM	• Results of verification tests. • A full system / manufacture stage ECR • EMP • EFM • Operational Control Procedures • IHM	• In-Service ECR • Updated Operational Control Procedures • EMP for changes and system disposal • EFM • Draft Disposal Plan • IHM	• ECR for the disposal programme • Final Disposal Plan • IHM

6   The Environmental Case

This section examines the how, why and when of gathering and documenting information about environmental issues for MOD PSS throughout its lifetime.

The Environmental Case includes evidence of what is required to demonstrate and achieve the management of environmental impacts and risks and what is required to fill in the known evidence gaps, and is built up gradually over the life cycle of the PSS. It contains information pertaining to each of the acquisition life cycle stages that the PSS passes through and will be updated at significant decision points within the project.

The Environmental Case fulfils the following important functions:

■ It demonstrates that a comprehensive and systematic approach has been taken to identify and reduce or eliminate negative environmental impacts and risks, and to enhance positive impacts associated with the PSS including its interaction with other systems.

■ It justifies any actions taken (or not taken) to reduce the environmental impacts and risks of the PSS.

■ It ensures that relevant information about environmental issues is easily available, understandable and accessible to MOD employees, contractors, regulators, and end users.

■ It demonstrates continual improvement in the environmental performance of the PSS.

■ It is a snapshot in time of the information contained in the Environmental Case.

■ The Environmental Case can be summarised at key decision points in a project by a series of environmental case reports, which provide an understanding of the potential environmental issues informing the decision whether to progress to the next stage of the project.

Delivery teams have used the POEMS process across a wide range of projects, from large scale shipping vessels, aircraft, land-based vehicles and tanks, ammunition and guns, through to small pieces of equipment used for synthetic training. This wide range of equipment shows the flexibility of the POEMS process to be proportionate to the size, complexity and environmental risk of a project.

An easy way to understand the requirements of an Environmental Case is to consider the following questions:

■ What information needs do the stakeholders have?

■ What impact(s) on the environment could this equipment have when being manufactured, tested, used, and disposed of?

- What impact(s) on the environment could this equipment have if involved in an accident or emergency?

- How serious are the identified impacts?

- Are any of these impacts covered by specified environmental standards, legislation or a specific piece of MOD policy?

- What has or can be done to reduce negative impacts and who is accountable?

- Has the MOD's efforts to reduce negative impacts made a difference to the environmental performance of the equipment?

- What has or can be done to maximise the positive environmental impacts?

The Environmental Case should be able to answer the above questions for the whole system under consideration for its defined uses.

The key building blocks of an Environmental Case include:

- EMP.

- Description of the PSS, including material inventory.

- Standards and legislation requirements, including MOD policy.

- Environmental aspects (actions or activities that can affect the environment).

- Environmental assessment and Environmental Impact Management (EIM) (where necessary), including priority assessment.

- Operational Control(s).

- Performance and Audit Results.

This information may be quantitative or qualitative depending on the information available at the time. It may also include roles and responsibilities for environmental management,

environmental data, environmental risk assessment methodologies, correspondence, minutes of meetings, and any other relevant environmental information. The Environmental Case can be seen as the sum of the outputs of the EMS that maintains it.

As the Environmental Case evolves, environmental considerations and consequent decisions that are made throughout the equipment's lifetime should be traceable and accountable. This working set of documents should be reviewed periodically. In addition, various situations may prompt a further review of the Environmental Case and re-issue of the environmental case report.

These include:

- Changes or modifications made to the equipment.

- Changes in the use of the equipment or the way that it is integrated with other equipment or platforms.

- Changes in operational theatre and boundaries of use.

- Changes in environmental legislation or MOD policy.

- A discrepancy between actual performance and design intention.

Ultimately, it will be the delivery team's responsibility to ensure that the Environmental Case is set up and maintained throughout the equipment's lifetime. In many cases, however, much of the information added gradually to the Environmental Case may be produced by suppliers or Contractors outside the MOD.

6.1 Environmental Cases for Legacy Systems

There may be cases where legacy equipment has not followed the full POEMS process although they do have some form of environmental assessment. Such information should be collated to form a retrospective Environmental Case which can then be added to as required throughout the remainder of the equipment's lifetime, such as operation and disposal. The existing information will also form the EMP to be applied throughout the remainder of the equipment's lifetime.

Questions to help determine the scope of POEMS for a legacy project:

- What is the Out of Service Date (OSD) of the equipment and will this remain fixed?

- Are there any modifications or upgrades planned?

- Have there been any environmental incidents associated with the capability's activities?

- Have there been any major changes in legislation or policy since the capability came into service?

- Who are the stakeholders that are likely to have any environmental concerns?

It is not normally necessary to retrospectively perform the analysis that should have be carried out earlier in the project lifecycle, for example to justify the original design decisions. However, new analyses may be necessary to fill in gaps in understanding for future lifecycle stages, such as to compile an inventory of hazardous materials to support safe disposal. The collation of this information will enable the delivery team to identify, manage, and mitigate the environmental risks that exist within the in-service and/or disposal stage, and influence the environmental outcomes of any future modifications or upgrades to the legacy system.

6.2 Environmental Cases for MOTS and COTS Equipment

The MOD procures a wide variety of Military Off The Shelf (MOTS) and Commercial Off The Shelf (COTS) equipment. In these cases, it may not be possible for the MOD to exert any influence over the design of the products, although it should be possible to:

- ■ incorporate environmental considerations into the choice of product, and

- ■ Use and dispose of the product in such a way as to reduce its environmental impact.

For MOTS and COTS equipment it is important therefore that the Environmental Case should record information demonstrating that these points have been considered and support any consequent purchasing decisions.

In cases where the project involves the development of an existing commercial product there may be opportunities for the MOD to incorporate environmental considerations via minor modifications in the development phase or after-market modifications.

In cases where PSS is being procured from an overseas supplier there may be only limited scope for product modification to meet UK requirements. Once again, the Environmental Case for such a product should show that environmental issues were considered when deciding if and how the design could be changed. The Environmental Case should also include a gap analysis of the UK and the supplier's requirements to provide assurance that the equipment is legally compliant for use within the UK. If use of a DED will be required, the project plan must account for gaining the necessary approvals.

When procuring MOTS and COTS, the basic design of the equipment or service is likely to be stable. In most cases the manufacturer or supplier will have an assessment of the main impacts of the PSS.

The delivery team should seek assurance that the available information will allow them to show conformance with the requirements of POEMS. If the supplier has not undertaken such an assessment, then the delivery team must arrange to obtain the necessary information to make good any deficiency, including the likely effects of any modifications.

6.3 Environmental Cases for UORs

PSS procured as an Urgent Operational Requirement (UOR) is needed to satisfy an operational imperative. Environmental management activities are still necessary and may have to be undertaken in compressed timescales. It is recognised that it may not be possible or practical to apply the full POEMS process before the UOR comes into service nonetheless, the potential environmental impacts of a UOR cannot be ignored. Any outstanding POEMS procedures should be undertaken as soon as practicable.

The main principles of POEMS that should be applied to UORs include:

- ■ Undertake all procedural elements of POEMS.

- ■ If it is proven that all or part of a procedure is impractical to apply then the reasons for this must be clearly documented, and agreement reached with S&EP of an alternative action.

- ■ Environmental Committees should be consulted to validate any agreements that may replace procedural outputs.

- ■ The Environmental Case must identify potential limitations if a procedure was not fully completed.

- ■ The Environmental Case must be continuously reviewed to show reflect the results of operational experience and incorporate the findings of environmental assessments and other POEMS outputs as they become available.

A review of the Environmental Case applied to the UOR may merely require the collection and collation of information not previously available. However, in other circumstances, it could mean a significant review of parts of the POEMS procedures. Once the UOR becomes a core capability the review process within POEMS will require the remaining assessments to be undertaken in a specified time to ensure a full environmental case exists for the capability.

6.4 Environmental Cases for PFI and PPP

Public Finance Initiatives (PFI) and Public Private Partnerships (PPP) should meet the same environmental standards as POEMS. It may be appropriate to transfer the requirement for conformance with POEMS to the PFI and PPP Contractors; however, accountability for environmental management cannot be transferred. The Contractor's approach in relation to POEMS objectives and outputs should be reviewed by the delivery team, and approved or endorsed through an Environmental Committee.

The responsibility for the quality of the information in the Environmental Case and compliance with all legal and policy requirements lies with the delivery team. As such, they will need to be sufficiently involved with, and informed of, the contractor's competence, procedures and practices to satisfy them that all the environmental issues associated with the project are being adequately addressed. The delivery team need to make clear which elements of POEMS implementation will rest with the contractor and which will be retained by them.

6.5 Combining the Environmental Case with the Safety Case

In some projects, it will be both financially and administratively beneficial to combine the Environmental Case with the Safety Case to produce a single set of information, as well as to avoid unnecessary duplication of information. The decision on whether to combine both cases will rest with the individual delivery teams and upon the size and complexity of the project.

If the Safety and Environmental Cases are combined, information should be marked as attributable to a safety or an environmental assessment, as appropriate. The segregation of environmental and safety information in this way will assist audits and enable the delivery team to respond efficiently to any requests received.

7 Competence and Training

Key Messages

Both organisations and individuals responsible for environmental management activities must be 'competent' for those tasks.

The management of competencies allows organisations to define requirements for different roles and to assess and improve the competence of people assigned to those roles.

7.1 Competence

Competence is defined as the ability to apply skills, knowledge and experience to perform certain activities to a required and defined standard; which is critical to success in professional roles within ISO 14001. Other factors such as attitude, behaviours, physical ability, and mental state can also affect someone's competence.

There is a MOD environmental competence scheme for people with environmental responsibilities in acquisition, allowing the MOD to define the requirements for different roles and to assess and improve the competence of people assigned to those roles. Competence can be improved by training and by practical application under supervision. Documentary evidence of competence should be retained as part of the Environmental Case.

Beyond legal compliance, DE&S is a learning organisation and is committed to continuous improvement across all areas of environmental management, which includes the on-going development of a positive environmental culture throughout the organisation, encompassing all levels, specialisms and business areas.

7.2 Training

Cranfield University at the Defence Academy, Shrivenham, offer a suite of environmental courses sponsored by the MOD. The courses have been designed to outline the MOD's commitment to environmental management, legislative requirements, and sustainable procurement in the defence acquisition process. They are specifically intended to support personnel in becoming acquisition environmental practitioners for the MOD and gaining practitioner membership of the Institute of Environmental Management and Assessment (IEMA). The courses are delivered by the faculty at Cranfield University and are delivered in a way to encourage participant engagement through a combination of taught sessions, syndicate and practical workshops.

The Environmental Awareness and Compliance in Defence course is a two-day introductory level course introducing environmental awareness in the MOD. It includes relevant legislation to the MOD, environmental management systems such as ISO 14001:2015, life cycle assessment and an introduction to POEMS.

The POEMS course is a five-day practitioner programme that outlines how to practically implement this mandated system. The course covers a detailed insight into the application of the core procedures.

The Sustainable Development in Defence Acquisition course is a two-day introduction describing sustainable development, and the MOD's approach to integrating sustainable procurement in acquisition. Course content includes an introduction to sustainable procurement, sustainable management tools, and sustainable consumption and production.

Attendance and successful completion of the courses above, including the POEMS Continued Professional Development (CPD) element, where the delegates implement POEMS back in the workplace with the support of a mentor, qualifies delegates to apply for practitioner membership of the IEMA.

More information on these courses can be found on Defence Academy website under the business section.

Final thoughts

It is recognised that effective environmental management in defence is complex, with increasing responsibilities being introduced through legislation, regulations, and MOD policy to protect and conserve the natural environment, and to act in an environmentally responsible manner.

The MOD approach outlined in this booklet is based on existing good practice and experience with environmental management in the acquisition process.

Reflecting on experience with environmental management, if the MOD and its delivery teams apply a proportionate approach to environmental management, building competence and understanding as well as links to other related initiatives, then significant improvements in both PSS and MOD's environmental performance will result.

This booklet aims to enable the reader to understand how environmental management is undertaken within the acquisition process within MOD, with an aim at working towards a process of continuous environmental improvement.

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Acronyms

ASEMS .... Acquisition Safety and Environmental Management System

BAT .... Best Available Technique

BPEO .... Best Practicable Environmental Option

BPM .... Best Practicable Means

CADMID/T .... Concept, Assessment, Demonstration, Manufacture, In-service, Disposal/Termination

COTS .... Commercial off the Shelf

DE&S .... Defence Equipment & Support

DSA .... Defence Safety Authority

ECR .... Environmental Case Report

EFM .... Environmental Features Matrix

EMP .... Environmental Management Plan

EMS .... Environmental Management System

HS&EP .... Health, Safety and Environmental Protection

IHM .... Inventory of Hazardous Materials

ITT .... Invitations to Tender

LCA .... Life Cycle Assessment

MLU .... Mid-life Upgrade

MOTS .... Military off the Shelf

PFI .... Public Finance Initiatives

POEMS .... Project Oriented Environmental Management System

POSMS .... Project Oriented Safety Management System

PPP .... Public Private Partnerships

PQQ .... Pre-Qualification Questionnaires

PSS .... Product, Service or System

REACH .... Registration, Evaluation, Authorisation and Restriction of Chemicals

SofS .... Secretary of State

SME .... Subject Matter Expert

SP .... Sustainable Procurement

SRD .... System Requirement Documents

S&EP .... Safety and Environmental Protection

UOR .... Urgent Operational Requirement

URD .... User Requirement Documents

Standards and MOD Publications

BS 8555..Environmental Management Systems - Guide to the phased implementation of an environmental management system including the use of environmental performance evaluation.

BS EN 8900..Guidance for managing sustainable development

BS EN 8903..Principles and framework for procuring sustainably

ISO 14001..Environmental Management Systems - Specification with guidance for use.

ISO 14004..Environmental Management Systems - General guidelines on principles, systems and supporting techniques.

ISO 14040..Environmental management - Life cycle assessment: Principles and framework

ISO 14044..Environmental management - Life cycle assessment: Requirements and guidelines

Def Stan 00-051..Defence Standard 00-051 Environmental Management Requirements for Defence Systems (Part 1 Requirements, Part 2 Guidance)

DSA regulations..A series of Defence Safety Authority regulations including DSA 01.1, the Defence Policy for Health, Safety and Environmental Protection; its supporting guidance (DSA01.2), and domain-specific regulations (DSA02 series) and regulatory guidance (DSA 03 series).

MRP ....Military Aviation Authority (MAA) Regulatory Publications

POEMS..DE&S Project Oriented Environmental Management System

Links

www.asems.mod.uk..Contains DE&S policy and guidance, including POEMS.

www.defencegateway.mod.uk ....Hosts the Defence Standardization website and the Acquisition System Guidance (ASG, formerly the AOF) – which contains information on acquisition policy and good practice for the MOD and Industry partners.

www.gov.uk ....Contains government services and information, including policy published by the Defence Safety Authority (DSA), the Environment Agency (EA) and the Department for Environment, Food and Rural Affairs (DEFRA).

www.iema.net ....Institute of Environmental Management contains useful information and resources.

www.legislation.gov.uk.............................Contains legislation for the UK, including Scotland, Wales and Northern Ireland.

eur-lex.europa.eu...EUR-Lex provides access to European Union law.

Ministry
of Defence