Ministry of Defence

JSP 309
Fuel and Industrial Gas Health, Safety and Environmental Protection

Part 2: Guidance

Contents

1 Introduction

1. Part 2 of JSP 309 provides guidance on how to comply with the Defence Regulations set out in Part 1. The guidance is presented as a Defence Code of Practice and emulates the layout used by the UK National Health and Safety Executive (HSE). A Defence Code of Practice is provided for each Defence Regulation in the following format:

Regulation	The Defence Regulation is reiterated in the relevant DCoP to aid clarity and reinforce the relationship and precedence of the Regulation to the DCoP.
Rationale	The reason why the Defence Regulation is applied to the MOD, ideally with reference to national legislation, BSIs or industry codes of practice.
Defence Code of Practice (DCoP)	The DCoP provides practical advice on how to comply with the Defence Regulation. If the DCoP is followed then this will be considered sufficient to demonstrate compliance, however alternative approaches may be utilised where this produces an outcome that can be demonstrated to be as good as required by the Regulation.
Guidance Material	Guidance Material provides advice that, whilst not compulsory, can be considered 'good practice' to further support the Regulations and DCoPs.

2. There are four key definitions that apply to the implementation of the Defence Regulations:

a. **Must**. Describes an activity that is mandatory and descends directly from National Legislation.

b. **Shall**. Describes an activity that is mandatory but stems from Defence Regulations in the absence of National Legislation

c. **Should**. Describes an activity that is considered to be good practice. If the activity is followed then this will be considered sufficient to demonstrate compliance with a Regulation. However, alternative approaches may be utilised where this produces an outcome as good as required by the Regulation.

d. **Could**. Describes an activity that is considered to be good practice but recognises that there are other methods available to the practitioner that provides an equally safe outcome.

3. FGSR provides assurance to S of S that the MOD is operating as safely as reasonably practical, and is complying as far as is reasonably practicable with national legislation by inspecting and certifying MOD fuel facilities. The FGSR inspection is conducted by completing a Fuel and Gas Safety Assurance Assessment (FGSAA), a checklist that verifies

that a facility complies with national legislation as well as Defence and civilian industry codes of practice.

4. If a fuel facility passes the FGSR inspection a Certificate for Continued Operation (CCO) will be issued for that facility. The FGSR Certificate is equivalent to the certification regime imposed on civilian petrol storage facilities by the Petroleum Consolidation Regulations (2014).

5. The Defence Regulations articulated in JSP 309 are annotated as conditions of certification on the FSAA. If a facility is non-compliant with a Defence Regulation the CCO may be withdrawn and enforcement action is likely to be taken. If the CCO is withdrawn, operation of the facility would be expected to cease.

6. In the years when FGSR does not conduct a site inspection, the unit is to complete the FGSAA as a self-assessment. The self-assessment shall be submitted to FGSR and should be submitted prior to the anniversary of the certificate. If the self-assessment indicates the facility is non-compliant with a Defence Regulation the certificate may be withdrawn and enforcement action is likely to be taken. If the CCO is withdrawn, operation of the facility would be expected to cease.

7. There are 12 Defence Regulations for fuel and gas storage and handling in the MOD; all are mandatory.

8. Units can apply for exemptions from Defence Regulations and even national legislation by following the DLSR exemption application process.

Risk Assessments and Safety Cases	
Regulation 1	Those operating Defence fuel and industrial gas facilities **must** complete a suitable and sufficient Risk Assessment for all processes and activities involving gases, fuel and lubricants, which shall be reviewed on an annual basis.
Regulation 2	Those operating Defence fuel and industrial gas facilities **shall** implement a suitable and sufficient Environmental Management System to manage the fuel and gas environmental risks identified in the site Risk Assessment.
Applicable Legislation, Defence Regulations, Policy and Guidance, Information Management	
Regulation 3	Those operating Defence fuel and industrial gas facilities **must** complete a suitable and sufficient Risk Assessment that complies with the Dangerous Substances and Explosive Atmospheres Regulations.
Regulation 4	If an explosive atmosphere could exist then those operating Defence fuel and industrial gas facilities **must** implement a plan that identifies the Hazardous Areas.
Regulation 5	Those operating Defence fuel and industrial gas facilities **must** demonstrate that all electrical and mechanical machinery and portable equipment used in Hazardous Areas is identified as fit for purpose for the respective zones, is correctly maintained and is asset tracked in accordance with DSEAR.
Emergency Arrangements Incident Management and Learning from Experience	
Regulation 6	Those operating Defence fuel and industrial gas facilities **shall** produce a suitable and sufficient Unit Spillage Response Plan.
Regulation 7	Those operating Defence fuel and industrial gas facilities **shall** practice the Unit Spillage Response Plan on an annual basis
Supervision and Control of Activities	
Regulation 8	Those operating Defence fuel and industrial gas facilities **shall** appoint an appropriate person to manage the facility on behalf of the Duty Holder.
Personnel Competence and Training Organisational Leadership, Culture, Capability and Change Management	
Regulation 9	Those operating Defence fuel and industrial gas facilities **shall** only allow personnel who are suitably trained and competent to operate the facility; these persons shall be recognised through a formal Certificate of Competence.
Equipment/Materiel and Infrastructure Maintenance	
Regulation 10	Those operating Defence fuel and industrial gas facilities **must** demonstrate that the infrastructure facilities are fit for continued use.
Regulation 11	Those operating Defence fuel and industrial gas facilities **must** hold an electrical inspection certificate that passes the facility as fit for continued use.
Equipment/Materiel and Infrastructure Design and Manufacture	
Regulation 12	Those operating Defence fuel and industrial gas facilities **must** ensure that the Road Tanker Delivery Stand is located in a safe, well ventilated position in the open and should offer a clear and unobstructed forward escape route.

2 Risk Assessments and Safety Management Systems

Contents

Regulation 1

Those operating Defence fuel and industrial gas facilities **must** complete a suitable and sufficient Risk Assessment for all processes and activities involving gases, fuel and lubricants, which shall be reviewed on an annual basis.

Rationale

The Management of Health and Safety at Work Regulations 1999 (Regulation 3) requires employers to assess the risk to the health and safety of their employees and to anyone else who may be affected by the workplace activity. This is necessary to ensure that preventative and protective steps can be identified to control hazards in the workplace

The significant findings of risk assessments must be recorded in writing. This applies to organisations where 5 or more employees are employed. The MOD is treated as an organisation in its entirety; small tasks involving less than 5 people still require significant findings to be recorded in writing.

JSP 815 contains the policy and direction on Health, Safety and Environmental Protection (HS&EP) in Defence. It confirms the legal requirement to conduct a risk assessment in accordance with Regulation 3 of the Management of Health and Safety at Work Regulations. This Defence policy is reiterated in JSP 375 Management of Health and Safety in Defence, in detail in Part 2 Chapter 8.

Defence Code of Practice (DCoP)

1. **FGSR Fuel Safety Assurance Assessment.** The completion of a site risk assessment that identifies the presence of fuel facilities on the site is a mandatory requirement for the site to be certified fit for continued operation. This fundamental principle establishes the conditions that ensure other Defence Regulations in JSP 309 can be complied with.

2. **Five-step risk assessment.** JSP 815 and JSP 375 both state there are 5 principal steps to follow when conducting a Risk Assessment. The 5 steps are repeated here with a particular emphasis on the fuel and gas domain. The risk assessment must be carried out by a competent person or persons (a complex risk assessment may require a team). Failure to employ person(s) competent to carry out the risk assessment may bring into question whether the risk assessment is 'suitable and sufficient' as required by the Management of Health and Safety at Work Regulations.

3. **Step 1 – Identify the hazard.** The main hazards identified with fuel and gas storage are: **fire**, **explosion** (see also DSEAR), **health** (i.e. COSHH) and **environment** (pollution). Storage of industrial gases also includes the physical hazards such as high **pressure** and **cold** temperature. In addition to the hazards presented by the fuel or gas itself, the risk assessment must also consider the location that the activity or process is carried out and check for potential hazards present in the area such as overhead or underground utilities, and nearby activities by other parties. The local environment (ambient temperature, altitude/pressure) can affect the properties of the fuel/gas. Concentrate on anything with the potential to cause serious harm to defence personnel, contractors and visitors etc. Also ask for input from defence personnel involved in or affected by the activity or the subject matter. Accident and ill-health records are a good way of revealing why and how accidents have occurred in the past. Manufacturer's instructions and datasheets contain information that should also be considered. Take into account any hazards with the potential to cause long term (chronic) ill-health to defence personnel e.g. noise, vibration.

4. **Step 2 – Identify who might be harmed and how.** Consider those undertaking the activity as well as adjacent workers, visitors, members of the public etc. The number of personnel exposed to the hazard may also be a significant factor. Legislation requires special consideration be given to vulnerable groups such as young workers, expectant mothers, disabled personnel, or anyone else who is not familiar with the location or the activity and may therefore be at increased risk. Consider how people may be harmed: is it through physical contact with fuels, gases, plant or equipment; inhalation of fumes or dust; environmental conditions or extremes of temperature (fire/explosion) etc.

5. **Step 3 – Evaluate the risks and decide on control measures.**

a. **Risk rating.** The most common methods to objectively evaluate risk use a balance of the probability (likelihood) of a hazardous event occurring, and the severity (consequence) of harm resulting from the hazard. Numbers can be assigned to each of the factors and multiplying the two together can produce a risk rating. The risk rating can then assist with prioritising those that need to be controlled. The risk rating can be expressed in the form of a matrix such as that shown below:

Note: MOD Form 5010 uses a 3x3 matrix.

			Probability				
			Almost Certain	High	Medium	Low	Improbable
			5	4	3	2	1
Severity	Major	5	**25**	**20**	**15**	**10**	**5**
	High	4	**20**	**16**	**12**	**8**	**4**
	Medium	3	**15**	**12**	**9**	**6**	**3**
	Low	2	**10**	**8**	**6**	**4**	**2**
	Minor	1	**5**	**4**	**3**	**2**	**1**

b. **Hierarchy of control measures.** Having identified the hazards, the personnel exposed, and prioritised the risk the general hierarchy of control measures can be applied:

Eliminate	Remove the need to store bulk fuel or gas
Reduce	Reduce the quantity of fuel/gas being stored
Isolation	Store the fuel/gas a safe distance from other activity, use barriers/guards
Control	Certify operators are competent
PPE	Issue suitable protective equipment
Discipline	Establish rules/procedures

6. **Step 4 - Record and implement findings.**

a. The risk assessment should be recorded using the methodology of MOD Form 5010 (this form may be modified to meet local requirements by adding fields but not removing any or changing the methodology); be clear and concise with the minimum use of acronyms and control measures clearly summarised. The findings of risk assessments must be brought to the attention of those at risk of harm and appropriate training and instruction given on the implementation of the control measures.

b. If a commanding officer or manager, at any level, considers that resources (financial, human, material) available to them do not provide for control or mitigations which reduce the safety risk ALARP, they are to refer it to a relevant higher commanding officer or manager for consideration and action and are not to proceed/continue with the activity.

c. The level of acceptable risk is dependent on circumstances; accepting environmental risks in peacetime on a 'home base' near a Site of Special Scientific Interest (SSSI) would be more difficult to justify than an operational scenario where fuel is needed to conduct operations to minimise casualties.

d. The risk assessment should be sanctioned by the person with the appropriate authority and responsibility to decide when the level of risk is ALARP and tolerable, a well-constructed risk assessment will aid in this decision.

e. The degree of rigour applied by a commanding officer or manager to risk assessment for an activity is to be proportionate to the consequences of failure.

7. **Step 5 - Review the assessment and update if necessary.**

a. All risk assessments should be regularly reviewed at a frequency proportional to the risk (e.g. high risk – 6 monthly; medium risk – annually; low risk – every 2 years) or more frequently; i.e.:

(1) Where required by local instructions/procedures.

(2) If the safe execution of the activity relies on stringent supervision and/or adherence to a safe system of work.

(3) If there is reason to doubt the effectiveness of the assessment.

(4) Following an accident or near miss.

(5) Following significant changes to the task, process, procedure, equipment, personnel or management.

(6) Following the introduction of more vulnerable personnel.

(7) If a “generic” risk assessment has been used then it should be reviewed before the activity begins.

b. Control measures and mitigations are monitored to determine their continuing effectiveness; corrective actions are taken as necessary.

c. Temporary controls may be necessary until full implementation of the identified additional control measures is achieved.

d. There is no MOD requirement to re-do a risk assessment just because the MOD form 5010 has been updated, however it is strongly recommended to ensure the most recent format is used when risk assessments are reviewed.

8. **Retention of Records.** Risk assessments and associated documents should be retained for a minimum of 3 years and in accordance with JSP 375, Part 2, Volume 1, Chapter 39 - Retention of Records.

9. **Safety Cases.** The MOD policy on Safety Cases in JSP 815 states if the work-related defence activity is complex and/or if the consequence of failure whilst conducting the activity are significant for the health or safety of the workforce or public, it may be appropriate to produce and document the risk assessment as a Safety Case. A Safety Case is a structured argument, supported by a body of evidence that provides a compelling, comprehensible and valid case that a system is safe for a given application in a given operating environment. It includes health and environmental risk assessments as appropriate. The owning commanding officer or manager is to decide whether to produce such a Safety Case in consultation with the relevant regulator(s) and recognise the requirements of legislation or Defence regulations. Further guidance on the requirements on Safety Cases can be found in JSP 815.

Guidance Material	10. There is a significant number of commercial and Defence sources that provide guidance on completing a suitable and sufficient Risk Assessment, too many to list here. The primary source of reference is the HSE Guidance Document: HSG 65 – Successful Health and Safety Management 11. The principal MOD publication on Risk assessments is JSP 375.

Regulation 2	Those operating Defence fuel and industrial gas facilities **shall** implement a suitable and sufficient Environmental Management System to manage the fuel and gas environmental risks identified in the site Risk Assessment.
Rationale	The MOD recognises the importance of protecting the environment and that good environmental management is an essential element of MOD business. To ensure that environmental protection is effective, appropriate and transparent, the MOD implements Environmental Management Systems (EMS).
Defence Code of Practice (DCoP)	1. The implementation of a formal EMS that recognises the environmental hazards associated with storing bulk fuels and gases is a mandatory requirement for the site to be certified as fit for continued operation. 2. An EMS is a comprehensive whole-site management system for which Fuel and Gas storage is only one part. The FGSR Fuel Safety Assurance Assessment seeks to verify that the unit has an EMS, and that, specifically, fuel and gas hazards have been correctly identified. 3. The EMS should be owned by the unit, and is usually administered by the site/unit Health and Safety representative incorporating Environmental Protection. Fuel and gas managers need to have a working knowledge of the EMS and know their EMS responsibilities. 4. Bulk Fuel storage represents a significant environmental risk in terms of potential for pollution and it is important that fuel operations are fully assessed and mitigated. Likewise, certain gases have significant environmental aspects and need to be carefully and legally accounted for. 5. The starting point of an EMS is the Initial Environmental Review (IER), which examines and assesses all site activities for their environmental Aspects and Impacts: a. Aspects are the element of a sites activities, products and services that can interact with the environment. With regards to bulk storage of fuel, aspects would include the potential for leaks into the environment, either through accident or through failure of infrastructure. For gas an aspect could be the potential for release to atmosphere. b. An impact is the effect that an aspect has or could have upon the environment. Using the example above, a large fuel spill would have an impact on the environment in terms of contamination of land, contamination of Controlled Waters, contamination of groundwater etc. The accidental release of an ozone depleting substance would have an impact upon the atmosphere resulting in climate change.

6. The result of assessing the aspects and impacts of a site's activities is to get an accurate picture of the environmental risks. These risks can then be addressed and mitigated, appropriate to the scale of the problem. In the case of Fuel and Gas, mitigation can take the form of operating procedures, infrastructure, PPM, training and spill response.

7. The Unit Spill Response Plan (USRP) is the principal mitigation measure that is most influenced by EMS. The USRP should be formulated in response to the aspects and impacts identified in the IER, and the pollution prevention measures (training, scale of exercise, Pollution Control Equipment) should be proportionate to the level of risk identified. In addition, the information contained in the USRP such as drainage plans, locations of interceptors etc. should be obtained from the site information contained within the EMS. Close links with the EMS will ensure that information is kept current and relevant. The importance of the USRP is reinforced by further Defence Regulations in JSP 309.

8. Once EMS processes are established (Plan, Do) it is necessary to ensure that they are effective and that they remain so (Check, Review). Emergency procedures are to be practiced on a regular basis, and the lessons learned are to be documented and incorporated to improve performance. Likewise, documents are to be reviewed annually to ensure that they remain current and that they accurately fulfil the requirement.

9. The greatest source of information available for establishments to produce a viable USRP is gained by lessons learnt from previous spillages on site. Unit Pollution Control Officers should record lessons learnt and formulate likely scenarios identified from their risk registers and spill history. These scenarios should then be used as tools for table top training and exercises. A list of likely scenarios (not exhaustive) is detailed below.

a. Leak from above ground storage tank – contained in bund.

b. Leak from above ground storage tank/pipeline/drum/ Jerricans – not contained in bund. (Pathway/Receptor-impermeable concrete, drainage system, inland waters, soil – type of soil).

c. Leak from semi buried, underground storage tanks, underground pipelines (Pathway/Receptor, inland waters, into buildings, soil type, sewage/ rainwater drains).

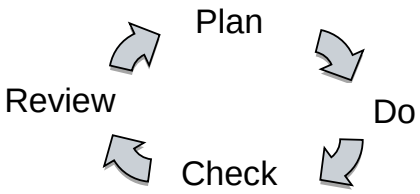
d. Leak from BFCV – on establishment or deployed on task (Pathway/receptor issues).

e. Leak from storage tank/pipeline on fuelling jetty. (Pathway/ Receptor-maritime).

10. In summary, whilst it is not specifically a Fuel Management function to devise and implement an EMS, it is crucial that fuel and gas Managers are actively involved in the environmental risk assessment process, notify the EMS owner of the fuel and gas hazards and risks, and are responsible for their activities. In particular, the measures for pollution prevention and emergency spill response are to be suitable and sufficient, documented, actively practiced and regularly reviewed.

Guidance Material

11. EMS is a formal, structured approach to managing the aspects of a site's activities, products or services that have, or could have an impact upon the environment. There are many types of EMS standards available, such ISO 14001, EC Eco-Management and Audit Scheme (EMAS) and the British Standard (BS) 8555. Despite variations in content between different EMS standards, they all follow the same "PLAN, DO, CHECK, REVIEW" cycle.



12. JSP 309 is not the MOD policy on EMS; JSP 418 is the MOD publication that provides full guidance on EMSs.

13. National Environment Regulators (EA, SEPA) did publish Groundwater Protection Codes of Practice for the storage of petroleum/liquid hydrocarbon in underground storage tank facilities. Some of these codes are not supported by the EA (i.e. PPG03) but continue to be considered best practice by other Regional Agencies These Codes of Practice continue to provide sound principles which help to prevent pollution of groundwater; they identify 4 key elements:

a. The undertaking of **Assessment of Risk** to groundwater.

b. The provision of appropriate **Engineering Requirements.**

c. The implementation of suitable **Management Systems and Controls.**

d. The preparation of suitable **Emergency Plans and Procedures.**

3 Dangerous Substances and Explosive Atmosphere Regulations

Contents

Regulation 3

Those operating Defence fuel and industrial gas facilities **must** complete a suitable and sufficient Risk Assessment that complies with the Dangerous Substances and Explosive Atmospheres Regulations.

Rationale

The Dangerous Substances & Explosive Atmospheres Regulations 2002 (DSEAR 02; SI 2002/2776) aim to protect the safety of workers and others that may be at risk from dangerous substances that can cause fire or explosion. DSEAR 02 is the framework adopted by the UK Government (HSE) to facilitate compliance to the ATEX 137 (99/92/EC) Directive.

DSEAR 02 is designed to complement the UK Equipment Protective Systems Regulations (EPS 96) which originated from the ATEX 100a (94/9EC) Directive and require electrical and non-electrical products to be compliant for their intended use in the relevant Hazardous Zone.

DSEAR Regulations apply to employers and the self-employed at most workplaces in Great Britain where a dangerous substance is present or could be present. The MOD is not exempt from this legislation unless the Secretary of State for Defence issues a certificate in writing to state the exemption, in the interests of national security. The MOD therefore must meet the statutory requirements set in the conduct of daily duties and complete a suitable DSEAR risk assessment in accordance with DSEAR 2002 Regulation 5 (Risk Assessment).

Defence Code of Practice (DCoP)

1. Fuel is a volatile flammable liquid, therefore all processes/ activities involving Fuel & Lubricants (F&L) and some gases (i.e. storage, handling, distribution, and maintenance of systems/plant), are potential hazardous activities. In accordance with national legislation these processes require a risk assessment. The completion of a risk assessment that identifies the DSEAR risks of bulk fuel/gas storage is a mandatory requirement for a MOD fuel facility to be certified as fit for continued operation.

2. Satisfying the requirement of JSP 309 Regulation 3 is a **must** for all MOD Bulk Fuel, Bulk LPG, Packed F&L storage installations, Gas Cylinder Stores and distribution facilities in order to ensure compliance with DSEAR 02 Regulation 5. Bulk storage is defined as the storage of F&L in static containers greater than 200 litres capacity; or permanent fixed containers identified as part of infrastructure, irrespective of capacity.

3. The procedures for identifying the hazards and subsequent implementation of risk assessments are detailed in JSP 375 – Management of Health and Safety in Defence; the principles are:

a. The CO/HoE owns the risk and the responsibility to ensure that all areas where explosive atmospheres are likely to be present are identified, assessed and controlled in accordance with DSEAR. This includes ensuring that Stage 1 and 2 DSEAR RAs are conducted; establishing hazardous area zones etc.; and providing information to the infrastructure provider to allow drawings to be updated and signs to be moved/erected etc. The CO/HoE should appoint a Hazardous Area Manager (where appropriate) to co-ordinate this function and monitor compliance.

b. The responsibility for maintaining the infrastructure and associated site plans, building/facility drawings, fixed signage, etc. rests with the infrastructure provider. The infrastructure provider must provide the Commanding Officer / Head of Establishment (CO/HoE) with assurance that the correct category of fixed assets/electrical systems is maintained and is compliant with the hazardous area classification in accordance with the appropriate DSEAR RA.

c. A Stage 1 DSEAR Risk Assessment (RA) must be undertaken (to ascertain if a full DSEAR Assessment is required) for any process or activity that is suspected to have the potential to create an explosive atmosphere in normal operation, handling, storage or maintenance. The RA should be recorded on MOD Form 5014.

d. If the Stage 1 DSEAR RA identifies a possibility of dangerous substances or processes that may result in an explosive atmosphere, then a Stage 2 DSEAR RA should be carried out by a competent person(s). The Stage 2 DSEAR RA assesses the fire and explosion risks that may result from the ignition of the dangerous substances. A summary of the residual hazards and risks should be recorded on MOD Form 5014 (DSEAR Risk Assessment) and reference the relevant supporting RA report and hazardous area drawings.

e. The MOD DSEAR RA is to be signed off by two signatories who were directly involved in conducting the Stage 1 DSEAR Risk Assessment. The two signatories are the manager responsible for the process **AND** a qualified safety risk assessor (i.e. NEBOSH General Certificate in Occupational Health and Safety, or a national or MOD recognised equivalent), with suitable DSEAR awareness training. The two signatories **must not** be the same person.

4. For a fuel installation the following supplementary DSEAR requirements are to be followed:

a. An initial Stage 1 Risk Assessment (MOD Form 5014), as detailed in JSP 375, is to be completed to identify whether the potential for an explosive atmosphere exists. **This shall be held by the Operating Authority**.

b. If an explosive atmosphere does exist, a Stage 2 Risk Assessment (MOD Form 5014) shall be completed, which includes a plan showing the boundaries of hazardous zones. **This shall also be held by the Operating Authority where applicable.**

5. Sites exclusively storing Class 3 fuel (Diesel MT, UK and Marine) **must** complete a DSEAR Risk Assssment. Under normal ambient operating conditions in the UK, Class 3 fuel will not normally be expected to produce an explosive atmosphere and the MOD Form 5014 can be closed at Stage 1 without requiring a more detailed Stage 2 Risk Assessment resulting in Hazardous Area Drawings. Civilian codes of practice are increasingly recognising the DSEAR risk from Class 3 fuels and it is likely that Hazardous Areas will be applied. MOD policy and direction is evolving on this, and the DSEAR qualified Risk Assessor should consider the issue as part of the risk assessment process.

6. For a gas installation the following supplementary DSEAR requirements are to be followed:

a. **Gas Cylinder Storage Compounds.** As a minimum requirement, gas cylinder storage compounds shall have a Stage 1 DSEAR risk assessment completed in accordance with JSP 375. If the Stage 1 risk assessment identifies a dangerous process or explosive atmosphere, then the Stage 2 risk assessment shall be carried out.

b. **LPG.** As a flammable gas, a documented risk assessment of the LPG storage area and its surroundings is required under DSEAR; and all workplaces where an explosive atmosphere may occur must be classified into hazardous and non-hazardous areas. Hazardous areas must be classified into zones by a Competent Person.

(1) **Bulk LPG.** Bulk and surrounding areas fall within the scope of DSEAR 02 therefore a risk assessment shall be carried out to ensure that all equipment used within the hazardous areas are DSEAR compliant. A drawing is to be produced showing the hazardous areas. A copy of the DSEAR Risk Assessment and the drawing showing the hazardous areas is to be kept on-site and made available for any persons requiring access.

(2) **Outdoor LPG cylinder storage areas.** Outdoor LPG cylinder storage areas can be considered as non-hazardous places in the sense of DSEAR on the basis that a source of release is unlikely provided that:

(a) The outdoor LPG cylinder storage areas is designed, constructed, maintained, and managed fully in accordance with this document and;

(b) The cylinders stored are complaint LPG cylinders, sourced from the current MOD contract.

c. **Liquid oxygen.** Liquid oxygen is a dangerous substance that can contribute significantly to ignition and combustion where an explosive atmosphere is present. Whilst liquid oxygen does not fall into the scope of DSEAR 02, it is subject to codes of practice regarding ingress protection (IP) that contribute to a safe environment that compliments DSEAR. The DSEAR Risk Assessment should consider the presence of liquid oxygen and the safety management system must recognise the interaction between these hazardous regimes.

Guidance Material

7. The DSEAR hazards of flammable liquid fuels is generally well understood; the MOD has had procedures to identify and categorise hazardous areas and install appropriately rated electrical equipment prior to the UK DSEAR 02 legislation. It is when unanticipated explosive atmosphere situations arise that accidents will happen. All F&L bulk storage installations must be assessed for their applicability to the DSEA; this includes waste F&L, and to liquids with a flashpoint above 60°C, which are stored at temperatures close to or above their flashpoint or at high altitude low atmospheric pressure environments. Irrespective of storage temperature, installations where F&L can escape as a mist or spray have the potential to produce an explosive atmosphere and the Duty Holder must ensure that a risk assessment is completed.

8. JSP 375 – Management of Health and Safety in Defence, Part.2 Volume 1, Chapter 9 mandates the requirement to complete a Stage 1 DSEAR Risk Assessment. The Stage 1 RA should be completed using MOD Form 5014. If the Stage 1 RA indicates an explosive atmosphere is likely then a Stage 2 RA is to be completed. There is no template form for a Stage 2, instead a suitably competent person will conduct a risk assessment from first principles which will include the identification, consideration and careful examination of:

- the hazardous properties of the substance;
- information on safety provided by the supplier, including information contained in any relevant safety data sheet;
- the circumstances of the work including:
- the amount of the substance involved;
    - the work processes, procedures and substances used and

their possible interactions;
    - where the work will involve more than one dangerous substance, the risk presented by such substances in combination; and
- the arrangements for the safe handling, storage, transport and disposal of dangerous substances and of waste containing dangerous substances.
- activities, such as maintenance, where there is the potential for a high level of risk;
- the effect of measures which have been or will be taken;
- the likelihood that an explosive atmosphere will occur and its persistence;
- the likelihood that ignition sources, including electrostatic discharges, will be present and become active and effective;
- the scale of the anticipated effects of a fire or explosion;
- any places which are or can be connected via openings to places in which explosive atmospheres may occur
- any such additional safety information

9. **Bulk LPG.** Further guidance can be found in the UKLPG Association: Bulk LPG Storage at Fixed Installations Code of Practise 1.

10. **Material Handling Equipment (MHE).** Power operated vehicles, MHE, and cranes can present a risk of fire and explosion. Under the provisions of DSEAR 02, it is the responsibility of operators, with advice from Front Line Commands to identify and risk assess the hazardous zones where MHE will operate. This is particularly important on overseas theatres where local ambient temperatures and atmospheric pressure is different to normal UK conditions. Ill-informed, excessive or over-zealous zoning of hazardous areas can prohibit MHE or other vehicles from operating in areas where the DSEAR risk is low. Common areas where hazardous areas are over-zoned include:

a. Bulk Fuel Carrying Vehicle parking areas

b. Aircraft refuelling areas

c. Road Tanker Delivery Stands. The Association for Petroleum and Explosives Administration (APEA) and other organisations provide guidance on minimum recommended distances of a filling point from occupied buildings, site boundary, and fixed sources of ignition that could be considered when completing a DSEAR RA.

11. **HSE Guidance.** Additional guidance to satisfy all requirements of DSEAR 02 is provided by the HSE Approved Code of Practise L138.

Regulation 4	If an explosive atmosphere could exist then those operating Defence fuel and industrial gas facilities **must** implement a plan that identifies the Hazardous Areas.
Rationale	The Dangerous Substances & Explosive Atmospheres Regulations 2002 (SI 2002/2776) aim to protect the safety of workers and others that may be at risk from dangerous substances that can cause fire or explosion. DSEAR 02 is the framework adopted by the UK Government (HSE) to facilitate compliance to the ATEX 137 (99/92/EC) Directive. DSEAR 02 is designed to complement the UK Equipment Protective Systems Regulations (EPS 96) which originated from the ATEX 100a (94/9EC) Directive and require electrical and non-electrical products to be compliant for their intended use in the relevant Hazardous Zone. DSEAR Regulations apply to employers and the self-employed at most workplaces in Great Britain where a dangerous substance is present or could be present. The MOD is not exempt from this legislation unless the Secretary of State for Defence, in the interests of national security, issues a certificate in writing to state the exemption. The MOD therefore must meet the statutory requirements set in the conduct of daily duties and prepare area classification plans to identify places where, because of the potential for an explosive atmosphere, controls over sources of ignition are required in accordance with DSEAR 02 Regulation 7 (Classify hazardous areas where Explosive Atmospheres may Occur).
Defence Code of Practice (DCoP)	1. Fuel is a volatile flammable liquid, therefore all processes / activities involving Fuel & Lubricants (F&L) and some gases (i.e. storage, handling, distribution, and maintenance of systems / plant), are potential hazardous activities. Having completed a DSEAR Risk Assessment (RA) in accordance with national legislation and Defence Regulations it is necessary to classify hazardous and non-hazardous areas. The classification of DSEAR hazardous areas is a mandatory requirement for a MOD fuel facility to be certified as fit for continued operation. 2. DSEAR Regulation 7 requires areas where explosive atmospheres may occur to be classified into hazardous and non-hazardous workplaces. Any hazardous workplaces should also be classified into zones. Such workplaces and zones should be identified as part of an employer's assessment of risk under Regulation. 3. Hazardous area classification should be carried out as an integral part of a risk assessment process. Its purpose is to define the extent, frequency and duration of any occurrence of an explosive atmosphere (the zone). The zone in turn defines the requirements for the selection and installation of equipment and protective systems so as to prevent sources of ignition.

4. DSEAR control measures apply particularly to the selection of fixed equipment that can create an ignition risk; but the same principles may be extended to control the use of mobile equipment; other sources of ignition that may be introduced into the workplace, e.g. matches and lighters; and the risks from electrostatic discharges.

5. In situations where an explosive atmosphere has a high likelihood of occurring, reliance is placed on using equipment designed for that area, i.e. with a low probability of creating a source of ignition. Conversely, where the likelihood of an explosive atmosphere occurring is reduced, equipment constructed to a less rigorous standard may be used. BS EN 60079-10 explains the basic principles of area classification for gases and vapours. These standards form a suitable basis for assessing the extent and type of zone, and can be used as a guide to complying with DSEAR Regulation 7 and Schedule 2. However, they cannot give the extent and type of zone in any particular case, as site-specific factors should always be taken into account; as identified during a detailed Stage 2 DSEAR risk assessment.

6. The conclusions of an area classification study usually take the form of drawings identifying the hazardous areas and types of zones. This is normally supplemented by text giving information about the dangerous substances that will be present, the work activities that have been considered, and other assumptions made by the study. Whenever such drawings and documents have been produced, they should be retained as part of the documentation in support of DSEAR Regulation 5. These documents should be reviewed annually (according to JSP 375) or whenever new equipment or processes are to be introduced into a zoned area.

7. JSP 375 – Management of Health and Safety in Defence, clearly defines the DCoP and states the minimum standards for the MOD Fuel and Gas installations. JSP 375 states that where a Stage 2 DSEAR RA is required the Hazardous Area Classification Drawings **shall** be produced and form part of the site record. Drawings are to conform to the following requirements:

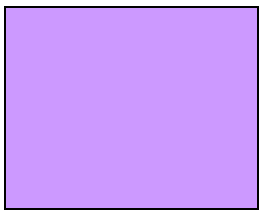
a. Be compatible with the existing site drawings and be in CAD format (as a single layer) where CAD drawings already exist.

b. Key dimensions of plant and zones should be shown on the diagram in order to allow for clear identification of the zones on the installation.

c. Be of suitable quality to enable black and white reproduction.

d. Zoning should be in accordance with the marking convention in IEC 60079-10.

e. Site plan view should be provided showing zoned areas.



f. Plan and elevation for each facility or activity which should include normal operations.

g. Temperature Class and Gas Group for equipment in the zoned areas should be marked on the diagram.

Guidance Material

General

8. Production of a Hazardous Area Classification Drawing only **IS NOT** compliance of the DSEAR 02 Statutory Requirement but is required as part of a DSEAR Risk Assessment.

9. The aim of hazardous area classification is to avoid ignition of those flammable releases that may occur from time to time in the normal operation of facilities handling flammable liquids and vapour. The approach is to reduce to an acceptable minimum level the probability of coincidence of a flammable atmosphere and an electrical or other source of ignition.

10. It is not the aim of hazardous area classification to guard against the ignition of major releases of flammable materials under catastrophic failure of plant such as failure of containment. The incidence of such releases must be kept within acceptable limits by correct design, construction, maintenance and operation of facilities.

11. Hazardous Zones will occur where fuel or flammable gases are stored or handled. Examples of some of these locations on MOD facilities are as follows:

a. Mechanical Transport Fuelling Installations (MTFI).

b. Bulk Fuel Installations (BFI).

c. Dangerous goods store.

d. Ship-to-ship or ship-to-shore fuel transfer operations.

e. Interceptors and Separators.

f. Filling of containers and drums.

g. Areas where a spill or leak has occurred.

h. Contaminated Joint Operating Fuel System (JOFS) storage.

i. Bulk Fuel Carrying Vehicles (BFCV) and BFCV Parks.

j. Uninstalled engine test facilities.

k. Gas Storage and Handling including:

(1) Storage of gas cylinders including LPG.

(2) Bulk LPG storage.

(3) Liquid Oxygen.

l. Hardened Aircraft Shelters (HASs) – Crown Fire Standard E10 Aircraft Hangars Annex A or Annex B as appropriate refer.

m. Aircraft Hangars – Crown Fire Standard E10 Aircraft Hangars Annex C refers.

n. Marine Facilities and Jetties – For vessels the appropriate maritime code of regulation such as DG Ships, IEC 6000920502 Tanker – special features and the International Safety Guide for Oil Tankers and Terminals (ISGOTT) refer.

Properties of hazardous areas

12. A Hazardous Area can be defined as a three-dimensional space in which an explosive atmosphere may be expected to be present at such frequencies as to require special precautions for the design and construction of equipment, and the control of other potential ignition sources. There are 3 levels of areas subdivided into Zones based on the likelihood of occurrence and duration of a flammable atmosphere, as follows:

a. **Zone 0.** A place in which an explosive atmosphere consisting of a mixture with air of dangerous substances in the form of gas, vapour, or mist is present continuously or for long periods frequently. (Typically > 1000 hr/year).

b. **Zone 1.** A place in which an explosive atmosphere consisting of a mixture with air of dangerous substances in the form of gas, vapour, or mist is likely to occur in normal operation occasionally. (Typically 10-1000 hr/year).

c. **Zone 2.** A place in which an explosive atmosphere consisting of a mixture with air of dangerous substances in the form of gas, vapour or mist is not is not likely to occur in normal operation but, if it does occur, will persist for a short period only. (Typically 1-10 hr/year).

d. **Non-hazardous areas.** An area defined that does not fall into any of the above.

13. For the purpose of hazardous area classification, a source of release is defined as a point from which a flammable gas, vapour or liquid may be released into the atmosphere. Three grades of release are defined in terms of the likely frequency and duration as follows:

a. **Continuous Grade Release.** A release that is continuous or nearly so, or that occurs frequently and for short periods. (Typically likely to be present for more than 1000 hr/year).

b. **Primary Grade Release.** A release that is likely to occur periodically or occasionally in normal operation i.e. a release which, in operating procedures, is anticipated to occur. (Typically likely to be present for between 10 and 1000 hr/year).

c. **Secondary Grade Release.** A release that is unlikely to occur in normal operation and, in any event, will do so only infrequently and for short periods i.e. a release which in operating procedures, is not anticipated to occur. Such releases may be of known size e.g. fracture of a drain, or unknown size e.g. corrosion hole. (Typically likely to be present for between 1 and 10 hr/year and for short periods).

14. The grade of release is dependent solely on the frequency and duration of the release. It is completely independent of the rate and quantity of the release, the degree of ventilation, or the characteristics of the fluid, although these factors determine the extent of vapour travel and, in consequence, the dimensional limits of the hazardous area.

15. Building apertures must be considered as these influence external hazardous Zones.

16. Once the hazardous area classification drawing has been produced, there must not be any changes to the process or layout of the facilities without reference to the competent person responsible for the drawing/zoning. Any modifications may change the Zone classification. Where changes are necessary it is essential that the Zones are checked and reclassified and that the DSEAR risk assessment is amended as appropriate.

Extreme operating conditions

17. Care is to be taken on facilities that are storing Class II (2) or Class III (3) fuels respectively in elevated ambient temperatures. If Class II and Class III products are stored above their flashpoint then the ambient temperature can expected to be above 38°C. (Ambient temperatures of +50°C are not uncommon in current operating theatres).

18. Class II or Class III products, which are stored or handled at temperatures above their flash point, or are stored in conditions that are likely to cause mists or spays, are identified as Class II (2) and Class III (2) products respectively. When F&L products are to be stored in the Class II (2) or Class III (2) condition, or are likely to be exposed to conditions above their flash point *(or within 5°C of flash point),* the facilities should be classified as laid down for Class I and the hazardous Zones are to be marked accordingly.

Industry references

19. Additional guidance to satisfy the requirements of DSEAR is provided by the HSE Approved Code of Practise L138 which states “Gases, vapours, mists and dusts can give rise to explosive atmospheres when dispersed in certain concentrations in air. The risk assessment carried out under regulation 5 informs the hazardous area classification and preparation of an area classification plan (required by regulation 7) and is intended to identify places where, because of the potential for an explosive atmosphere, controls over sources of ignition are required “

20. The Model Code of Safe Practice Part 15 – Area Classification for installations handling flammable fluid (4th Ed) provides additional technical guidance for the production of Hazardous Area drawings for competent persons.

21. IEC 60079-10-1 Classification of area – Explosive Gas Atmospheres provides additional guidance for the standard intended to be applied where there may be an ignition hazard due to the presence of flammable gas or vapour, mixed with air under normal atmospheric conditions

Regulation 5	Those operating Defence fuel and industrial gas facilities **must** demonstrate that all electrical and mechanical machinery and portable equipment used in Hazardous Areas is identified as fit for purpose for the respective zones, is correctly maintained and is asset tracked in accordance with DSEAR.
Rationale	The Dangerous Substances & Explosive Atmospheres Regulations 2002 (SI 2002/2776) aim to protect the safety of workers and others that may be at risk from dangerous substances that can cause fire or explosion. DSEAR 02 is the framework adopted by the UK Government (HSE) to facilitate compliance to the ATEX 137 (99/92/EC) Directive. DSEAR 02 is designed to complement the UK Equipment Protective Systems Regulations (EPS 96) which originated from the ATEX 100a (94/9EC) Directive and require electrical and non-electrical products to be compliant for their intended use in the relevant Hazardous Zone. DSEAR Regulations apply to employers and the self-employed at most workplaces in Great Britain where a dangerous substance is present or could be present. The MOD is not exempt from this legislation unless the Secretary of State for Defence, in the interests of national security, issues a certificate in writing to state the exemption. The MOD therefore must meet the statutory requirements set in the conduct of daily duties to satisfy the requirements of Schedule 3 to DSEAR 02 Regulation 7 (2). This requires equipment and protective systems for all places in which explosive atmospheres may occur must be selected on the basis of the requirements set out in the Equipment and Protective Systems Intended for Use in Potentially Explosive Atmospheres Regulations 1996 unless the risk assessment finds otherwise.
Defence Code of Practice (DCoP)	1. Fuel is a volatile flammable liquid, therefore all processes / activities involving Fuel & Lubricants (F&L) and some gases (i.e. storage, handling, distribution, and maintenance of systems / plant), are potential hazardous activities. Having completed a DSEAR Risk Assessment (RA) and identified hazardous areas in accordance with national legislation and Defence Regulations it is necessary to install appropriately rated equipment to control the risk of ignition. DSEAR and European ATEX Regulations specify that those equipments must be asset tracked and maintained correctly. This Defence Regulation captures that spirit and it is a mandatory requirement for a MOD fuel facility to be certified as fit for continued operation. 2. Preceding Regulations have mandated the requirement for Risk Assessments (JSP309 Regulation 1 and 3) that follow the guidance in JSP375. Common to all risk assessment processes is the requirement to control the identified hazards. In the case of DSEAR the following control measures are considered: a. Avoiding ignition sources in zoned areas, in particular those from electrical and mechanical equipment (including lightning

protection). Ideally, do not install electrical or mechanical equipment inside the hazardous area.

b. Equipment and plant that must be installed inside the hazardous area must have the correct Equipment and Protective Systems (EPS) categorisation.

c. Workers tasked with carrying out repairs or other necessary work must be provided with the appropriate equipment to allow them to carry out this work safely (i.e. gas detectors to detect flammable atmospheres, intrinsically safe tools etc.).

3. All plant, equipment, fixtures, fittings and tools etc. (including lighting, computers etc. in office spaces) used within a hazard zone must be rated as suitable for use in that zone classification or to a higher standard. The hazardous area zone classification and corresponding equipment categories are:

Zone		Definition of Zone	Equipment Category	Category Definition
Gas	Dust			
0	20	Continuous, long periods or frequently	1	Very high safety measure
1	21	Likely to occur occasionally	2	High safety measure
2	22	Unlikely to occur or for a short period only	3	Normal safety measure

4. The ATEX European Directive (94/9/EX) provided a standard for the design and testing of electrical/mechanical equipment to be used in areas where explosive atmospheres may be present. Equipment that complies with the EATX directive is usually marked as shown.

5. The ATEX symbol is followed by further codes that indicate specific details of that equipment such as: application area, equipment category, standard, rating, type of protection, gas group and temperature classification. The UK DSEAR 02 regulations have followed the ATEX directive

6. International, European and UK regulations, directives and codes of practice stipulate appropriate maintenance regimes for the equipment to remain ATEX compliant. The Defence Infrastructure Organisation (DIO) provides guidance on mandatory maintenance regimes on ATEX rated equipment.

7. In accordance with DSEAR 02, ATEX equipment must be asset tracked in order to audit and demonstrate that a specific item of

equipment has been maintained correctly.

8. ATEX and pre-ATEX hazardous area equipment may not be modified as any modification may breach the protection of the device. If repairs are required then these must be made using like-for-like spares.

9. Pre-ATEX equipment (i.e. prior to 1994) may comply with ATEX directive and should be tested by an appropriate organisation to demonstrate it is compliant and suitable for the hazardous area in which it is installed. It may be more efficient to replace the aging equipment with a modern ATEX compliant device.

10. Whilst ATEX and DSEAR is well recognised in the fuel domain, it applies equally to gas storage and handling, particularly with LPG and oxygen:

a. **Outdoor gas cylinder storage compounds.** For outdoor gas cylinder storage compounds designated for the storage of oxygen cylinders and/or flammable gases, all fixed, portable and self-contained electrical equipment shall be suitably protected (see BS EN 60079-14). Only electrical equipment certified as suitable for use in a Zone 2 area (or better) and constructed to a recognised standard shall be installed (see BS EN 60079-10).

b. **Gas cylinder storage inside specially constructed buildings.** All electrical equipment is to be provided to the approved classification / specifications (refer to BS EN 60079-10).

c. **LPG.** Where non explosion protected Mechanical Handling Equipment (MHE) is used in **LPG cylinder storage facilities only**, a specific risk assessment must be carried out (JSP 319 Part 2, Vol 1 Chapter 9 – para 107). Within Specially Constructed Buildings, internal and building located external lighting shall be to Zoned as identified from the DSEAR risk assessment. and give an average luminance of 350 lux in the horizontal plane 0.8 m Above Finished Floor Level.

d. **Bulk LPG.** Bulk LPG and surrounding areas fall within the scope of DSEAR 02 therefore a risk assessment shall be carried out to ensure that all equipment used within the hazardous areas are DSEAR compliant. The UK LPG Association highlights the specific zones associated with Bulk LPG for which the equipment selection must comply with Much of this is replicated in JSP319.

e. **Liquid oxygen.** Liquid oxygen (LOX) requires a completed DSEAR risk assessment and a Hazardous Area Plan is to be produced showing the hazardous areas. All power supplies and electrical accessories shall be intrinsically safe and compliant with DSEAR and ATEX regulations.

Guidance Material

11. **Civilian Guidance.** Additional guidance to satisfy the requirements of DSEAR 02 is provided by the HSE Approved Code of Practise L138 which demonstrates practical ways for an employer to satisfy DSEAR Regulation 7, Schedule 3.

12. **Defence Guidance.**

a. JSP 375 – Management of Health and Safety in Defence provides further guidance for the selection of suitable equipment detailing that equipment will be categorised for their use. The category will be suffixed with a letter denoting suitability for gas (G) or dust (D) zones. Equipment suitable for both gas and dust zones will be marked GD e.g. equipment suitable for Zone 1 or 21 will be marked as Category 2GD. Pre-ATEX equipment may not have these markings.

b. JSP 317 provides further guidance stating controls apply particularly to the selection of fixed equipment that can create an ignition risk; but the same principles may be extended to control the use of mobile equipment; other sources of ignition that may be introduced into the workplace, e.g. matches and lighters; and the risks from electrostatic discharges.

13. **Material Handling Equipment (MHE).** Power operated vehicles, MHE, and cranes can present a risk of fire and explosion. Under the provisions of DSEAR 02, it is the responsibility of operators, with advice from Front Line Commands to identify and risk assess the hazardous zones where MHE will operate, including operational theatres where climatic conditions may elevate the explosive atmosphere hazard.

4 Unit Spillage Response Plans

Contents

Regulation 6

Those operating Defence fuel and industrial gas facilities **shall** produce a suitable and sufficient Unit Spillage Response Plan.

Rationale

All facilities which store hazardous substances such as fuel hold an inherent risk of an incident which results in pollution. It may be possible to minimise this risk through stringent procedures and secure infrastructure, but the risk cannot be entirely ruled out. Consequently there is a legal requirement for facilities that store, handle and distribute petroleum products to have spillage response plans in place.

The MOD recognises the importance of having effective spillage response, and seeks to promote a standard model throughout the MOD estate. The Unit Spill Response Plan (USRP) describes this procedure.

Defence Code of Practice (DCoP)

Introduction

1. All MOD establishments which handle bulk fuels/hazardous substances **shall** have a Unit Spillage Response Plan (USRP). The requirement for a USRP is a mandatory requirement in the Fuel Safety Assurance Assessment to allow a MOD fuel facility to be certified as fit for continued operation.

2. The USRP is part of the unit Environmental Management System (EMS; JSP309 Regulation 2) and should be informed by the findings of the Initial Environmental Review. The EMS should dictate the scale and nature of the USRP so that the response is targeted and proportionate to the risk. In addition to EMS findings, units should analyse data from any previous spillages on site.

3. The USRP should identify the potential for incidents and accurately describe the actions needed to provide an effective spillage response. It should also identify the personnel and equipment needed to respond to the incident, and their specific roles. In some instances these plans may form part of a larger emergency incident plan (Major Accident Prevention Plan (MAPP) or Safety Report (SR)); there may also be a requirement for a copy of the plans to be submitted to Civil Authorities for information and/or authorisation.

4. If the spill could enter the sea then other legislation will be affected i.e. MARPOL.

Specialist advice

5. In developing a USRP, input and advice from a team of specialists who will inevitably be involved in an emergency response should be taken into account. Relevant technical Subject Matter Experts (SMEs) that should be engaged include:

a. MOD Estate Facilities Manager / Property Manager.

b. Maintenance Management Organisations (MMOs) e.g. Regional Prime Contractors (RPCs), Integrated Service Providers (ISPs) etc.

c. Aquatrine Service Providers (ASPs).

d. Defence Fire Risk Management Organisation (DFRMO).

e. Authorised Persons e.g. AP (Petroleum), AP (Electrical).

f. Pollution Control Officer (PCO) Pollution Response Teams (PRT).

g. Site Operators.

h. External agencies, such as local emergency services or the MOD contractor for Emergency Pollution Response Service.

Format of the USRP

6. **Standardised format.** The USRP should be produced to a standard format, the framework for this format is outlined below and a worked example is found at the JSP309 website. The key points concerning the suggested format are:

a. The standard format is a framework – information contained within the framework of the USRP shall be unit specific.

b. The adoption of the standard format across MOD will ensure the following:

(1) Standardisation across MOD.

(2) Improved understanding of USRPs by operators moving between units as the structure of the information, specifically the Annexes, should be the same for each unit.

(3) Improved understanding by inspection and audit teams.

(4) Improved integration with other emergency incident plans (MAPP/SR).

c. The key to success is sound decision-making, particularly in the early stage of the incident and at the decision of Tier categorisation.

d. The plan should be clear, concise, written in plain language and easily understood. This is because it is designed to be used in an emergency, and misunderstandings could lead to delay, further risk or harm. In addition, the USRP may be distributed outside the MOD to agencies who are not familiar with MOD writing conventions.

7. **USRP content.** Following the standardised format, the USRP should contain the following:

a. **Preliminaries.** The start of the USRP should contain the following common preliminaries:

(1) **Contents Page.** A full list of contents showing a breakdown of the content of the main document with a list of Annexes. The Annexes will detail the immediate actions and supplementary information, from the actions of an individual discovering a spillage to the reporting actions. The Contents Page should be clearly marked and the Annexes flagged to ensure swift and easy access to the 'actions to be taken' information detailed at the Annexes.

(2) **Amendment Sheet.** A sheet detailing the amendment state of the USRP. The Fuel Safety Assurance Assessment will check that the USRP has been updated.

(3) **Distribution.** A Distribution List is to be included. Distribution of the USRP, (both internal and external) is to include all relevant stakeholders (for example, Squadrons, Workshops, MTO, Guardroom, duty personnel packs, Regional Prime Contractors, Aquatrine Service Providers, Local Authorities etc., as required). There is also a requirement for units that qualify as a MACR site to have the USRP linked to either the Safety Report (SR) for MACR Top Tier Sites or the Major Accident Prevention Plan (MAPP) for MACR Lower Tier Sites. Unit distribution should be to all sections identified within the USRP and other key posts to allow ease of access to the plan when required.

(4) **Unit Commander's / Head of Establishment's Foreword.** A foreword by the Unit Commander is required to authorise and empower the USRP and those named within it. The Unit Commander, or his delegated representative, should sign the Foreword to indicate the acceptance of the USRP's contents.

(5) **Unit Safety and Environmental Organisation and Arrangement (O&A) Statements.** To support the Unit Commanders Foreword, a current copy of the unit / establishment Safety, Health, Environmental Protection, and Sustainable Development O&A Statement as mandated by the current Secretary of State for Defence is to be enclosed.

(6) **Definitions.** A list of definitions used within the USRP is to be provided to improve understanding of certain terms by personnel who may be unfamiliar with MOD acronyms and phraseology.

b. **Introduction.** The introduction to the USRP could simply state the sites that the plan applies to and provide an outline of the USRP process.

c. **Mission.** To prevent, contain, control and recover a spillage. The protection of the environment is of utmost importance, but not to the extent of endangering human life.

d. **Risk assessment.** An outline of the unit Risk Assessment should be provided to indicate the potential events/scenarios (aspects) that could lead to a spill and details of local environment that could be affected (impacts). Up-to date site plans of Bulk Fuels Infrastructure including: heating oil storage, standby generators, identifying underground fuel pipes, as well as adjacent utility underground pipework could be useful here.

e. **Action plan.** An outline of the plan from the person finding the spill, the Immediate Actions, the call out procedures, through to stabilising the situation.

f. **Command and control.** A list of named posts giving their responsibilities and actions in the event of a spill. This must be based on a realistic assessment of the unit's ability to respond to the identified potential spillage scenarios.

g. **Service support.** An outline of the unit's own support organisations, equipment and services, to include the Pollution Control Team (PCT), unit fire service, medical and DE FM organisations. Consideration must include the availability of trained response personnel, response equipment, transportation, communications, the mobilisation time, and access to the potential clean-up sites. Details of emergency repair equipment such as pipe clamps, flanges, bungs / leak stoppers etc. for infrastructure, and location of all pre-positioned Pollution Control Sorbent (PCS) kits could be given here.

h. **Outside agencies.** An outline of the external agencies that may be contacted in support of a spillage incident, to include Local Authorities, Emergency Services, Environment Agencies, Coastguard and spillage response contractors.

i. **Command and signal.** An outline of the reporting actions required with Reference to the MOD Spill Report (MOD Form 7772 and 7773).

j. **Communication.** Good communications are vital during a spillage incident. An outline of the communications to be used must include initial notification, subsequent mobilisation and on-going operations by the Pollution Control Team. It is imperative that the unit confirms the actions to be carried out by the initial point of contact, normally the MOD Operator, to ensure that the cascade call-out system is complete. Do not forget to include notification to the Unit Commander and other key players.

k. **Media actions and public interest.** An outline of the actions to be taken in the event of media interest. The details of the Unit Media Officer, normally the Community Relations Officer, could be included so that appropriate actions may be taken to control the information provided to the media.

l. **Security.** An outline of the security actions to be taken in the event of a spillage to cordon and control the area around the spillage and any public interest that may occur.

m. **Health and safety.** An outline of unit general and specific H&S considerations. The protection of human life is paramount. Under no circumstances are personnel to be exposed to unnecessary risk in the urgency of executing a USRP. A well thought out USRP will ensure adequate PPE is available.

n. **Disposals.** An outline of the process for the correct disposal of products, including waste, recovered after a spillage response. Contingency plans should identify methods to store: contaminated waste, “oily water”, emulsified oil, or fire fighting water/foam oily mixtures. These waste products and mixtures can be produced in great quantities, many times the volume of the original amount of spilled F&L.

8. **Annexes.** In most events, the USRP will be utilised by those personnel acting in response to a spillage incident. In these instances it is crucial that the minimum amount of time is taken to find the information required to make effective decisions. To assist in this process, a standard layout of the key information is crucial. Therefore, the USRP Annexes are to contain the primary actions for spillage response. All Annexes within the plan should be clearly marked and flagged to ensure swift and easy access to the information required, it may also be useful to be able to remove pages for photocopying as required. An example copy of URSP can be downloaded from the JSP 309 website. The Annexes are quite prescriptive; this is to ensure the Annexes contain the essential information required during a spill response incident without having to read the main body of the USRP.

Training and exercises

9. For a USRP to be effective all personnel that will be involved must fully understand their responsibilities and are competent in their roles. In addition to formal and role-specific training it is vital to undertake practical exercises. The site Environmental Risk Assessment should indicate the level and frequency of spill response exercises which can range from an in-unit desktop study through to a full deployment of personnel and equipment with interfaces with outside agencies (emergency services). Further details are given in JSP309 Regulation 7.

Plan Review/Amendment.

10. To ensure the plan remains accurate it must be reviewed at least annually and amended accordingly. Review and amendment should ideally take place following an incident or exercise, so that lessons can be incorporated.

Records and Reporting.

11. In the event of an incident, it is important to keep accurate records. The record should include details of all actions taken, communications with outside agencies, a summary of all key decisions made and details of all expenditure incurred. The unit's Pollution Control Officer is responsible for maintaining records. Some incidents may require reporting under RIDDOR or MACR/COMAH.

Guidance Material

12. JSP 418 provides further guidance on aspects of Environmental Protection, in particular: Environmental Management Systems and Pollution Prevention.

Regulation 7	Those operating Defence fuel and industrial gas facilities shall practice the Unit Spillage Response Plan on an annual basis
Rationale	Defence has no exemption from national legislation set out in the Environmental Protection Act 1990 and the Environmental Damage (Prevention and Remediation) Regulations 2009. To improve compliance across industry, the Environment Agency (EA) and Scottish Environment Protection Agency (SEPA) have produced Pollution Prevention Guidelines (PPGs). JSP 815 and JSP 418 entrust Commanding Officers/Heads of Establishment with a duty to the Secretary of State, and a personal responsibility, to ensure the health, safety and welfare of personnel, contractors and visitors on their establishments and to protect the environment. JSP 309 Regulation 6 mandates the requirement for a Unit Spillage Response Plan (USRP). For the USRP to be of value it should be familiar to those expected to use it. Exercising the USRP is the most effective method of practicing emergency spillage procedures and familiarising personnel with their duties.
Defence Code of Practice (DCoP)	1. The requirement to exercise the USRP on an annual basis is a mandatory requirement for a MOD fuel facility to be certified as fit for continued operation. 2. The scale and nature of the USRP exercise depends on the risks associated with the site. Site specific pollution risks should be identified during the Environmental Management System (EMS) process explained in JSP 418 Part 2 Leaflet 1, whilst noting pollution prevention consideration highlighted in Leaflet 2. Any processes or tasks falling out of the EMS or USRP, which may result in a high risk activity, should be assessed in accordance with JSP 375. The scale and nature of the USRP exercise should be proportionate to the risks associated with the storage of bulk fuel on a particular site. 3. The model presented in this DCoP recommends that the scale and nature of the USRP exercise should be based on the likelihood of the type of fuel spill the unit is likely to encounter. The type of spill is expressed by the 3 Tiers categories applied by the MOD: a. **Tier 1.** Operational spills where the clean-up is entirely within the unit / establishment capability. b. **Tier 2:** (1) Spillages that require assistance from another Service unit. (2) Spillages that require assistance from external civilian contractors/specialists (3) Spillages reportable to Environmental Regulators that have resulted in the “pollution” of controlled waters/

groundwaters or other environmentally sensitive areas.

(4) Spillages reportable under RIDDOR.

c. **Tier 3.** Spills beyond the capability of local and regional resources that requires major external or national assistance.

4. The spectrum of USRP exercises is outlined below:

a. **Absolute minimum.** Review USRP, verify nominated appointments are filled, verify contact telephone numbers, and physically check pollution control equipment is serviceable. This shall be done at least annually.

b. **In-unit exercise.** The exercise should include the establishment of a command centre, deployment of personnel and equipment, and test the USRP's interface with other plans, industry partners and units. The interface with external agencies may go so far as to verify communication links but will stop short of actual deployment of those external agencies. For all but the most low risk units, this level of exercise should be practiced annually. The in-unit exercise could be combined with the requirement s of the absolute minimum annual review described above. Skills and processes should be tested at all levels.

c. **Major exercise.** Units where the likelihood or severity of a fuel spill (i.e. the risk) is high then a major exercise should be practiced. A major exercise should engage external agencies including their deployment to the site. This can range from individual representatives as advisors through to full scale deployment of response teams and equipment. It is understood that engagement with external agencies depends on their availability and budgets so the frequency of a major exercise must be judged by the Commanding Officer / Head of Establishment (HoE). Sites that are subject to Major Accident Control Regulations (MACR) **shall** carry out Tier 1, 2 and 3 USRP exercises annually as required by JSP 498. The major exercise could be combined with the 2 lower level exercises described above.

5. Ultimately it is the responsibility of the HoE to ensure that the USRP is exercised sufficiently and at the correct level, even if the task of doing so is delegated to the Environmental Protection Officer (EPO) or other subordinate personnel. JSP 418 recommends that sites form a Safety, Health and Environment Committee that includes the HoE. Such a committee would be ideal in establishing the site specific USRP exercise requirements.

6. The assessment of risk of a fuel spill that informs the nature and scale of the USRP exercise is dependent on a number of factors, including; infrastructure age, fuel quantity, environmental and cultural impacts, and spill history. A table to help identify and assess the risks

is provided in the guidance notes below.

7. Records of USRP exercises should be kept and reviewed prior to the subsequent exercise. The decision making process behind the exercise scale and interval should be documented and captured in the EMS whole site management process.

Guidance Material

8. JSP 418 provides guidance on the management of environmental protection in defence. In particular, Part 2 Leaflets 1 and 2 provide pertinent guidance that will allow units to comply with this regulation. Whilst the use of an EMS is directed in defence policy, it is a crucial component to successfully identifying the environmental risks on a site, and ensuring that the USRP and the associated exercise are fit for purpose. Leaflet 1 will provide guidance on the completion of the EMS. Leaflet 2 identifies the responsibilities of the chain of command towards pollution prevention.

9. JSP 375 provides guidance on the management of health and safety in defence. In particular, Part 2 Volume 3 provides guidance on high risk activities on defence infrastructure. As a result of the EMS, the USRP may direct personnel to carry out pollution prevention activities that are high risk. The processes highlighted in JSP 375 should be followed to capture and mitigate any foreseeable risks.

10. JSP 317 Part 5 provides guidance on activities associated with pollution prevention through to pollution clean-up and can be used to guide the formulation of the USRP, as well as the associated exercise.

11. The tables below provide guidance to assist units in identifying exercise requirements for their site, particularly major exercises.

Table 1. USRP Exercise Requirement Level

Score (Table 2)	Exercise Level		
	Major	In-Unit	Minimum
<12	NA	Annual	Annual
13-24	Not less than 3 yearly		
>24	Annual		

(Table 2 next page)

Table 2. USRP Exercise Risk Assessment Factors

Component	Score			
	0	1	2	3
Fuel Quantity (litres)		<50000	50000 – 100000	>100000
Oil Water Interceptor Capacity		>7600 litres Full Retention **And either** Class 1, **or** Class 2 draining to foul water.	>7600 litres **but not** Full Retention **and / or** Class 2 draining to surface water.	<7600 litres
Age of Infra	<5 years	5 – 15 years	16 – 25 years	>25 years or unknown
Level 1 USSST[1] Score	0 or NA (above ground or GRP)	1 - 5	6 - 10	11 – 14 or unknown
Cultural Significance	None	Likely to impact scheduled monument, listed building, earthworks or similar	Likely to impact National Heritage Site	Likely to impact UNESCO World Heritage Site Spill likely to cause diplomatic issues (e.g. overseas base)
Ecological Significance[2]	None or brownfield site	Greenfield site	Site of national interest (SSSI, AONB, etc.)	Site of international importance (Ramsar, National Park)
Pollution Significance		Aquifer - Unproductive Strata	Aquifer - Secondary	Aquifer – Principal (Major) River or coastal location Not known
Manning		PRT and / or DFRMO available on site 24/7 Duty PCO available 24/7	First responders likely to be non-spill trained (e.g. guard force) Duty Officer available 24/7	Isolated location with limited manpower
Leak Detection Equipment		ATG with water detection / removal and overfill prevention device. Leak detection alarm systems linking to 24hr responder	ATG missing one or more of the following: • Overfill prevention device • Auto water detection / removal • Leak detection alarm	No ATG with daily manual dipping
Tank Design		Double skinned with interstitial space monitoring **Or** Above ground	Double skinned or lined / coated USSST	USSST
Number of Deliveries / Yr	Pipeline (GPSS)	<10	10-20	>20
Spills in last 3 years	None	<200 litres	200 -1000 litres	>1000 litres
Site Score				

[1] Underground Single Skinned Steel Tank.
[2] Note** Designations are not exhaustive. Further information can be found at http://jncc.defra.gov.uk/page-1527. Unit SHEF or environmentally trained person should assist.

5 Supervision and Control of Activities

Contents Regulation 8 – Fuel and Lubricant Manager

Regulation 8	Those operating Defence fuel and industrial gas facilities **shall** appoint an appropriate person to manage the facility on behalf of the Duty Holder.
Rationale	The MOD recognises the importance of the safety of personnel whether military or civilian as well as protecting the environment in Defence fuel and industrial gas facilities. The Health and Safety at Work Act 1974 (HSWA) and enabling regulations provide legislative framework for the safe storage and handling of fuel. The HSWA requires the employer (HoE) to provide suitable and sufficient information, instruction, training and supervision as is necessary to ensure so far as reasonably practible of the health and safe at work of his/her employees.
Defence Code of Practice (DCoP)	1. The requirement to appoint a F&L Manager, who is responsible for ensuring that the personnel operating the fuel facilities are competent, is a mandatory requirement for a MOD fuel facility to be certified as fit for continued operation. 2. Hazardous environments containing products classified by the Institute of Petroleum (IP) as Class I (petrol), II (aviation fuel) or III (i.e. diesel) shall be managed or supervised by a person who has been deemed as a Suitably Qualified and Experienced Person (SQEP). In the case of F&L, training, qualification and competency are certified with the appointment of a F&L Manager. The F&L Manager may manage a single fuel site, a group of local fuel sites, or indeed a complete region of fuel sites, the workload being dictated by the specifics of the site(s). 3. The size and complexity of F&L infrastructure will dictate the appropriate scale of staff. Between the HoE, the F&L Manager, and the operators, the HoE may appoint such staff at differing levels of management as is required to adequately manage and operate the F&L site(s). Whilst the HoE need not be specifically fuels trained, the staff directly managing and operating the site will require specific fuels training pertinent to their role. This JSP does not dictate a strict F&L management structure from HoE to operator, rather the TLBs, establishments and supporting contractors have scope to develop a management structure to suit their needs. In all cases however it is assumed that there will be a HoE responsible for H&S of his/her staff at the top of the establishment, and operators working on the fuel site. 4. The F&L Manager shall be formally fuels trained. The main roles of the F&L Manager are; a. Management of installation operators.

b. Co-ordinate the completion of Certificates of Competence (CoCs) for any operators employed in F&L duties.

c. Management of wet stock quantities and rotation.

d. Fuel quality assurance.

e. Monitoring of the F&L site infrastructure.

f. Co-ordination of in-unit F&L training (including spillage response).

g. Liaison with the Maintenance Management Organisation.

h. Liaison with the Aquatrine Service Provider (or local equivalent).

5. The training and qualification for F&L Managers within the MOD is provided by the Defence College of Logistics and Personnel Administration and delivered at the Defence Petroleum Training Sqn (DPTS) at West Moors Station and the Logistic (Supply) Training Sqn (LSTS) at RAF Halton. Military and civilian staff employed as F&L Managers should undertake the required training for their posts at these locations.

6. The specific location for nominated individuals to attend a F&L Managers' course will be dictated by the grade of fuel and type of installations as follows:

a. **Ground fuel MTFI only.** All Arms Fuel & Lubricants Manager Course at DPTS, West Moors.

b. **Aviation BFI only.** F&L Section Managers & Supervisors Course at LSTS, RAF Halton.

c. **Aviation BFI and ground fuel MTFI.** F&L Section Managers & Supervisors Course at LSTS, RAF Halton.

d. **Flying Club Aviation BFIs.** Flying Club Avn BFIs that distribute IP Class I product direct to aircraft shall be managed or supervised by a person who has been deemed as a Suitably Qualified and Experienced Person (SQEP). Training is to be provided by the manufacturer/supplier of the installation. Fuels training, qualification and competency are certified with the appointment of a F&L Manager specifically for that installation. As a minimum, Duty Holders and TLBs must be satisfied that the training provider is competent, accredited to an industry standard and that operator competence can be demonstrated to DLSR.

7. Alternative training courses are available and the Duty Holder will have to demonstrate an acceptable means of compliance. Attendance on the MOD provided training courses is strongly recommended.

Industrial Gases

8. Formal training in the handling of Industrial Gases is conducted by LSTS, RAF Halton. This course can be attended as part of the F&L Managers' Course or as a stand-alone course and is open to military and civilian staff employed as Gas Compound Managers.

9. Additionally, contractors employed by TLBs in gas cylinder compounds may be instructed by suitable civilian gas training providers. As a minimum, TLBs must be satisfied that the training provider is competent, accredited to an industry standard and assessed by an appropriate Conformity Assessment Body. TLBs shall be satisfied that the course content is compatible to that taught by the MOD recognised training school and that all contractor gas cylinder operators shall be fully conversant with the MOD procedures detailed within JSP 319 and other applicable MOD publications.

Guidance Material

10. Further guidance is provided in the following publications;

a. JSP 317 - Joint Service Safety Regulations for the storage and handling of Fuels and Lubricants.

Part 2 Health and Safety for F&L general.
Chapter 6 – Principles of Competent Person within F&L environment.
Section 3 – Training/Competence of MoD personnel/Civilian Contractors
Annex A – Appointment of staff to undertake Petroleum duties.

b. JSP 319 – Joint Service Safety Regulations for the Storage and Handling of Gases.

Chapter 5 Training- training requirements, training programmes and syllabus and training within the MoD.

6 Personnel Competence and Training

Contents Regulation 9 – Fuel Operator Certificate of Competence

Regulation 9	Those operating Defence fuel and industrial gas facilities **shall** only allow personnel who are suitably trained and competent to operate the facility; these persons shall be recognised through a formal Certificate of Competence.
Rationale	The MOD recognises the importance of the safety of personnel whether military or civilian as well as protecting the environment in Defence fuel and Industrial gas facilities. The Health and Safety at Work Act 1974 (HSWA) and enabling regulations provide legislative framework for the safe storage and handling of fuel. The HSWA requires the employer to provide suitable and sufficient information, instruction, training and supervision as is necessary to ensure so far as reasonably practible of the health and safe at work of his/hers employees.
Defence Code of Practice (DCoP)	1. The requirement for personnel operating fuel facilities to be suitably trained and competent, and demonstrated through a formal Certificate of Competence, is a mandatory requirement for a MOD fuel facility to be certified as fit for continued operation. 2. Operators shall have a Certificate of Competence in place prior to operating a bulk fuel facility. Certificates of Competence apply to ALL military and civilian employers where a dangerous substance is present or could be present in a gas or fuel environment. 3. All personnel that are working in either fuel or gas environments shall be trained on the following and it should annotated on their Certificate of Competence: • Given an over view of any site specific schematics. • The building's intake switch and main valves. • Appointment procedures of the facilities manager and maintenance team. • Roles and responsibilities of the facilities manager and maintenance team. • Overview of equipment and site specific anomalies. • Hazards specific to petroleum and gas products. • An overview of the permit to work system. • Appointment procedures, roles and duties of the Operating Authority in maintenance works. • Details of site specific routine maintenance tasks. • Details of future maintenance including new works. • The procedures for reporting defects.

4. All personnel shall be trained to operate first aid fire appliances and fire hydrant systems appropriate to local procedures and training taken on appropriate courses. In addition, operators shall be trained on the issue and receipt procedures, quality assurance and water checks, installation operations, correct use of PPE, unit spillage response plan, the use of pollution control sorbents (PCS) and the correct accounting procedures. This training shall take place prior to operations and will be reviewed every 12 months by the Authorised Person Petroleum, person in charge of the installation and the officer in charge of fuels and gases

Guidance Material

5. Further guidance is provided in the following publications;

a. JSP 317 provides further guidance on the Joint Service Safety Regulations for the storage and handling of Fuels and Lubricants.

Part 2 Health and Safety for F&L general.
Chapter 6 – Principles of Competent Person within F&L environment.
Section 3 – Training/Competence of MoD personnel/Civilian Contractors
Annex A – Appointment of staff to undertake Petroleum duties.
Annex B – Certificate of Competence

b. JSP 319 – Joint Service Safety Regulations for the Storage and Handling of Gases.

Chapter 2 MoD Fuels and Gases Organisation- GSAA self-assessments, gas facility audits.
Chapter 5 Training- training requirements, training programmes and syllabus and training within the MoD.
Chapter 6 Emergency situations, preparation and actions – specialist advice.

7 Equipment/Materiel and Infrastructure Maintenance

Contents

Regulation 10

Those operating Defence fuel and industrial gas facilities **must** demonstrate that the facility infrastructure is fit for continued use.

Rationale

Section 2 of the Health and Safety at Work Act requires employers to provide plant and equipment that is safe for employees to use. Compliance with this duty is demonstrated on MOD sites through an annual inspection of fuel facilities by a professionally qualified engineer who conducts a visual inspection of the installation and checks electrical and mechanical maintenance records.

Defence Code of Practice (DCoP)

Professional Engineer Inspection

1. The most effective method of demonstrating compliance with this Regulation for a fuel facility is an in-date certificate by DIO stating that it has been built and maintained to appropriate standards and is fit for use for **up to** a further 12 months.

2. The certificate is provided by a DIO mandatory inspection, the conduct of which is prescribed in the Practitioner Guide (PG) 06/12 – Professional Inspection of fuel infrastructure and flammable dangerous goods stores. PG06/12 sets the MOD Standard for the inspection of fuel infrastructure and flammable dangerous goods stores.

3. PG06/12 provides procedural guidance on the maintenance, inspection and testing of fixed mechanical and electrical equipment installed at petroleum installations on MOD estate. It is not a technical guide on the practical aspects of maintenance, inspection and testing of such installations, which is left to the professional skills and judgement of Competent Person(s) undertaking the work.

4. The PG06/12 inspection is an annual requirement and its purpose is to:

   a. Confirm that all currently applicable legislation and legal requirements are adhered to.

   b. Confirm that there is a maintenance management system in place and that the facilities are being maintained to the appropriate standard.

   c. Provide a report based on a thorough visual inspection of the facilities.

d. Review non-destructive examination data to ensure appropriate future actions are programmed as part of the asset management strategy.

e. Confirm that the installations can continue to be used until the next annual inspection or to precisely define the actions required in order for the installations to continue to be used.

5. The annual professional inspection does not evaluate operating procedures or fuel quality checks.

6. The PG06/12 inspection is required for the following facilities:

a. Storage for flammable liquids or aviation fuel including slops and buffer tanks.

b. Fuel transfer installations (e.g. cross-base pipelines and naval fuel jetties) including pigging facilities where appropriate.

c. Aviation fuel hydrant systems.

d. Mechanical transport fuelling installations.

e. Flammable dangerous goods stores.

f. Specialist installations for example; semi-permanent installations, jerry can filling plants.

g. Bulk storage installations for plant diesel and fuel oil.

h. Ancillary installations; including small plant diesel, fuel oil and waste oil installations.

Ancillary installations

7. Ancillary installations shall be examined annually. The MMO must appoint a competent person to undertake the ancillary tank inspections. The competent person must be suitably qualified and experienced to undertake the task and shall have an understanding of the current regulations, British/European Standards and industry standards to enable judgement to be made for the installation's compliance with legislation and fitness for continued operational use.

8. The MMO is to provide a declaration to the inspector confirming that these installations either:

a. Comply with current legislation, which will include the Control of Pollution (Oil Storage) (England) Regulations 2001 or The Water Environment (Oil Storage) (Scotland) Regulations 2006 along with associated guidance for above ground storage tanks (ASTs); and the Groundwater Regulations 1998 along with associated guidance for underground storage tanks (USTs).

or

b. Do not comply with current legislation but that an action plan is in place with appropriate timescales.

9. The declaration from the MMO must also confirm that there is an appropriate and implemented planned maintenance regime and is to be included in the professional inspection report.

10. Those undertaking the professional inspection shall examine a minimum of 10% of the ancillary installations in order to confirm the MMO declaration and include them as part of the professional inspection report. The professional inspector is expected to rotate the 10% sample each year, and consider tanks deemed to be high risk. This must specifically highlight where the MMO is not completing their responsibilities satisfactorily.

PG06/12 report

11. The inspector is required to complete and submit a report, the key elements of which will include:

a. A summary and recommendations, including a determination regarding future testing requirements and associated actions

b. A list of categorised defects and recommendations identified by the visual inspection

c. A statement of professional judgement on the condition of the fuel installations and flammable dangerous goods stores confirming that they are either:

(1) Fit for continued use until the next inspection or for a period of twelve months, whichever is sooner

or

(2) Fit for continued use for a specified period or under other restrictions to allow defined actions to be implemented

or

(3) Not fit for continued use

12. Any installation where the remedial action associated with an identified defect is required to meet statutory or mandatory obligations (Grade D) will be declared either:

a. Not fit for continued use

	or b. Fit for continued use for a restricted period to allow defined actions to be implemented 13. On release, the report will be distributed to FGSR in order to determine whether or not the installation is fit for continued operation, and instigate any necessary enforcement action. 14. The PG06/12 is applied by DIO to almost all MOD fuel facilities, including those operated and maintained under PFI/PPP contracts and overseas facilities. Any alternative means of compliance would have to demonstrate a standard comparable to the PG06/12. 15. The PG06/12 does not apply to gas storage facilities. Cryogenic and bulk LPG storage facilitities are subject to manufacturers written schemes of inspection. Evidence showing compliance with these written schemes will demonstrate regulatory compliance. Gas bottle compounds may be covered by the Flammable Goods Store section of the PG06/12.
Guidance Material	16. Further information on the DIO Professional Inspection can be found in PG06/12. 17. PG06/12 includes a visual inspection report template for temporary fuel facilities. FGSR recommend that the use of tactical deployable fuel infrastructure (i.e. Joint Operational Fuel System – JOFS) should be included in the scheduled professional inspection if planned to be installed for more than **6 months**. If a facility is planned for less than 6 months but becomes an enduring requirement then FGSR recommend that the facility becomes incorporated into the scheduled professional inspection. It is recognised that adding facilities to the PG06/12 may incur additional cost which must be addressed. Alternatively, military engineers can be tasked to conduct inspections of deployable equipment, normally on a 6-month cycle based on the equipment tecchnical publications. The inspection and maintenance regime should be addressed in the engineer design report for the facility.

Regulation 11	Those operating Defence fuel and industrial gas facilities **must** hold an electrical inspection certificate that passes the facility as fit for continued use.
Rationale	The Health and Safety at Work Act 1974 (Duties of Employers – Section 2) requires employers so as far as reasonably practicable to provide safe plant and systems of work. Electrical safety is further detailed in the Electricity at Work Regulations 1989 (EWR). These regulations impose duties on Duty Holders such that: All systems must be maintained so as to prevent danger (Regulation 4) and electrical equipment which may be exposed to any flammable or explosive substances shall be so constructed and protected that it prevent s danger (Regulation 6). The Dangerous Substances and Explosive Atmosphere Regulations (DSEAR) also place statutory requirements for inspection and testing of electrical equipment in hazardous areas. Inspecting and testing electrical components in a fuel installation provides verification and assurance that the condition of the electrical equipment is appropriate for operation in a hazardous area. This DCoP is applicable to all electrical systems within MTFIs; Bulk Fuel Installations (BFIs); bulk waste fuel compounds; Uninstalled Engine Test Facilities (UETFs); Oil Fuel Depots (OFDs); and bulk LPG compounds with an individual tank capacity greater than 1 Tonne. The MOD captures the statutory requirement in a number of DIO codes of practice.
Defence Code of Practice (DCoP)	1. The requirement for a MOD fuel facility to have an in-date certificate that the electrical installation is fit for continued use is a mandatory requirement for a MOD fuel facility to be certified as fit for continued use. 2. The verification process (testing / certification) shall be carried out during initial commissioning / major refurbishment of the subject infrastructure and at intervals recommended by the appropriate Design Authority / Industry ACoP / DIO Maintenance Guidelines. 3. Inspections and testing in DSEAR hazardous areas above shall only be undertaken by competent personnel who are suitably qualified and experienced to work on hazardous area equipment. 4. A certificate stating the condition of the electrical equipment shall be provided. If the facility is certified fit for continued use then the facility will demonstrate compliance with this Defence Regulation and should allow the facility to be given a FGSR Certificate for Continued Operation. If the facility is deemed **UNSATISFACTORY** then the operation of the facility should cease.

Guidance Material

General

5. Periodic testing of electrical equipment in bulk flammable liquid installations is required to satisfy maintenance requirements under DSEAR Regulations 6(4) and 6(8) and related schedule 1; and Regulation, 4(2) of the EWR with regard to the prevention of fire or explosion due to ignition of a dangerous substance, or flammable atmosphere. Inspection and testing should be carried out annually in respect of the following:

a. Within the hazardous area as defined by the DSEAR zone classification. The electrical installations within these areas shall be inspected, tested and maintained in accordance with the requirements of BS EN 60079 Part 17. For the purpose of this Guide the whole of the circuit shall be considered from point of origin to final point of termination, whether this is fully within the zone classification area or partly within the zone classified area.

b. Outside the hazardous area as defined by the DSEAR zone classification, but still within the fenced area which defines the clients declared hazardous area. These installations shall be inspected, tested and maintained accordance with the requirements of BS 7671 and the guidance given within IET Guidance Note 3.

6. A periodic inspection and testing programme shall be carried out to determine whether or not the condition of the electrical systems and equipment at the installation, and in particular electrical equipment within hazardous areas is satisfactory. The test results, categorised defects and observations should be recorded on the certificate for retention within the site electrical records in accordance with JSP 375 Part 2 Volume 1, Chapter 23 and Volume 3 Chapter 3.

7. DIO Practitioner Guides and Policy Instructions direct that electrical testing in hazardous areas shall be done annually.

8. Inspections, and testing in DSEAR hazardous areas above should only be undertaken by competent personnel who are:

a. Electrically qualified and experienced,

b. Deemed competent to work on hazardous area equipment on having completed suitable training and assessment by an accredited training provider.

c. Competent and experienced in the selection, use, inspection and maintenance of electrical apparatus designed and manufactured for use in hazardous areas. Refresher training for this should be undertaken at no less than 4 yearly intervals.

d. Familiar with JSP 375, Volume 3, Part 2, Chapter 5

Petroleum and Chapter 3 Electricity.

e. Experienced and knowledgeable of the installation to be worked on or under direct supervision of an experienced and knowledgeable person. JSP375 Part 2 Volume 3 Chapter 2 requires competent persons to be appointed by the Authorised Person (Electrical) as a Skilled Person prior to undertaking any works or tests on an electrical installation.

9. A model certificate for certifying compliance with the above statutory requirement is provided in the Association for Petroleum and Explosives Administration (APEA) code of practice: 'Design Construction Modification Maintenance and Decommissioning of Filling Stations' (The Blue Book) Annex 14.5. The Blue Book is the industry accepted standard for fuel forecourt design and maintenance. MOD industry partners have adopted the model certificate. The model certificate is called the **Certificate of Electrical Inspection and Testing**.

10. As best practice, the model certificate of electrical inspection should be annotated with one of 3 classifications, one of which is to be awarded for the verification of the installation and equipment.

a. A – SATISFACTORY, as far as could be ascertained.

b. B – SUITABLE FOR CONTINUED USE, subject to the defect(s) being remedied before the date(s) shown in the defect report attached.

c. C – UNSATISFACTORY, Defects observed are of a dangerous nature and require immediate attention.

11. Failure to have an in-date electrical test certificate, signed by a competent person, stating "SATISFACTORY" or "SUITABLE FOR CONTINUED USE" with acceptable in-date defects; will deem the installation as not fit for continued use and all operations within the installation should cease immediately.

12. If the electrical test certificate, signed by a competent person states "UNSATISFACTORY" the installation will be deemed as not fit for continued use and all operations within the installation should cease immediately.

13. The severity of defect on the test certificate should be coded in accordance with the B and C codes above and recorded on a defect report. Code B defects will be given a date by which the defect should be rectified. If the rectification date is exceeded then the electrical certificate is invalidated and the FGSR Certificate of Continued Operation is annulled and the operation of the facility should cease.

14. Alternative defect code systems, such as that used in BS 7671 (code C1- Danger present, C2 Potentially Dangerous, C3 Improvement

recommended) have been used previously. These systems may not be intended for hazardous area installations. The method endorsed for the MOD estate is the APEA Blue Book system.

15. Common defects identified during inspection and test should be codified to assist in trend setting and system fault diagnosis. Further guidance can be found in DIO Practitioners Guide 05/12 - Inspection, Maintenance & Testing of Equipment Installed at Petroleum Installations on MOD Property.

16. Where the test / inspection reveals a dangerous or potentially dangerous situation on an item of electrical equipment which requires immediate attention, the details should be identified in writing and handed to the site operator for action. The inspector / competent person should obtain a signature of the site operator for receipt of the notice, which should be retained with other site electrical records. (APEA Blue Book 14.10.3.1).

17. **Rectification of defects.** When an electrical defect is rectified, the remedial works should be traceable to the specifc defect listed in the Defect Report; i.e. the works order refers to a serialised defect on the electrical certificate. A demonstrable audit trail will ensure the electrical certificate remains valid and the facilitiy is compliant with JSP 309 Regulation 11. There is no regulatory requirement to repeat the electrical inspection or re-issue the electrical certificate.

LPG

18. For periodic testing of bulk LPG compounds greater than 1 Tonne. Installations shall be periodically tested in accordance with BS 60079-17 under the EWR. An assessment should be made (and recorded) at the time of issuing the completion certificate of :

a. The type of inspections required.

b. The period between inspections (should not exceed 12 months).

19. A model certificate certifying compliance with the above statutory requirement is provided in the UKLPG CoP Part 1, Chapter 5.1.4 and Appendix L.

Further Guidance and References

20. Design Construction Modification Maintenance and Decommissioning of Filling Stations (The APEA Blue Book) is the Industry Code of Practice for the petrol retail industry and details the verification process including test and certification of electrical systems throughout petrol filling stations.

21. The APEA Blue Book provides a defect codification system that is specifically designed for application to hazardous areas; it is the

preferred system for use on Defence fuel installations, by the MOD. Alternative systems on coding of electrical defects include the Institution of Engineering and Technology Guidance Note 3 (IET GN3) and the Electrical Safety First's Best Practice Guide 4 – 'Electrical Installation Condition Reporting; Classification Codes for Domestic and similar electrical installations'.on coding. These are only applicable to non-hazardous areas

22. UKLPG COP 1, Part 1 is the LPG distributors Industry Code of Practice and details the periodic electrical inspection for bulk LPG facilities.

23. BS 7671 – Requirements for Electrical Installations details the standards required for for wiring and testing. The test certificate in BS 7671 is not applicable to hazardous area electrical installations and the APEA have produced a specific model certificate that is encouraged for use on MOD fuel installations.

24. JSP 375 Part 2 Volume 1, Chapter 23 sets out the MOD procedures and guidance for electrical safety including test requirements.

25. JSP 375 Part 3 Volume 3 Chapter 3 sets out the safety rules and procedures for MOD electrical systems and their adoption is mandatory on the MOD estate.

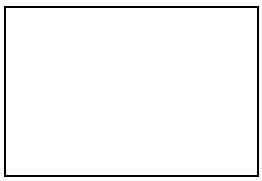
26. DIO Practitioners Guide 05/12 - Inspection, Maintenance & Testing of Equipment Installed at Petroleum Installations on MOD Property provides procedural guidance on the maintenance, inspection and testing of fixed mechanical and electrical equipment installed at petroleum installations on MOD estate.

27. DIO Practitioners Guide 04/09 – 'Inspection, Testing, and Certification of Low Voltage Electrical Installation on MOD Property' includes an updated section on hazardous areas and follows the guidance in the Blue Book, and not BS7671/GN 3. PG 04/09 is due to be re-published in 2016.

28. DIO Defence Maintenance Guidelines (DMG 14) – Motor Transport Filling Installation (MTFI) details the extent and periodicity of electrical systems testing required on an MTFI.

29. Defence Works Functional Standard 07 – Design and Installation Guide for Specialist Works on Petroleum Installations – Electrical (1995); details the requirements and competencies needed to conduct electrical testing test in hazardous places. This 1995 document pre-dates DSEAR (02) but has a useful explanation of hazardous area classification and the selection of appropriately rated electrical equipment. DW FS 07 has been superceded by PG05/12.

27. DIO Policy Instruction PI 2015/06 – Gas Safety Compliance introduces a suite of documents relating to gas safety compliance



within the MOD estate. The documents listed in the PI seek to assist Maintenance Management Organisations (MMO) in ensuring that gas networks and other gas infrastructure on the MOD estate are managed, operated and maintained in accordance with relevant legislation.

8 Road Tanker Delivery Stands

Contents Regulation 12 – Road Tanker Delivery Stands

Regulation 12	Those operating Defence fuel and industrial gas facilities must ensure that the Road Tanker Delivery Stand is located in a safe, well ventilated position in the open and should offer a clear and unobstructed forward escape route.
Rationale	The bulk delivery of hazardous materials (fuel, LPG, cryogenic gases) is recognised as a particularly hazardous activity which has resulted in the HSE producing a specific Approved Code of Practice (ACOP) with industry partners: HSE Health and Safety Guidance (HSG) L133- Unloading Petrol from Road Tankers. HSG L133 provides guidance for those people who are involved in the delivery and unloading of petrol and other dangerous substances at filling stations and other bulk fuel delivery sites, including petrol station site operators, road tanker operators, road tanker drivers and the authorities who have responsibility for enforcement of the Dangerous Substances and Explosive Atmospheres Regulations 2002 (DSEAR) at petrol filling stations. HSG L133 emphasises the importance of the risk assessment and the roles and responsibilities of the various parties involved. Command, control, communication and coordination (the 4Cs) are important in this activity. This DCoP is applicable to all road tanker bulk fuel delivery and issue activities throughout the MOD estate including: heating fuel oil, standby generator fuel, LPG and cryogenic gas deliveries. This DCoP should also be considered during bulk fuelling on operational and exercise training areas.
Defence Code of Practice (DCoP)	1. The requirement for a Road Tanker Delivery Stand (RTDS) to be located in a safe, well ventilated position in the open and should offer a clear and unobstructed forward escape route is a requirement for the facility to be Certified fit for Continued Operation and is a condition of certification. 2. Site operators must have safe infrastructure and procedures for tanker deliveries that cover the process from start to finish. These procedures shall include the provision of a safe means of entry and exit for road tankers and suitable protection for drivers during deliveries. 3. Equipment and facilities used for the unloading of bulk fuel, LPG and cryogenics shall be of appropriate design, suitable for the purpose

and correctly maintained, to minimise the risk of an incident involving bulk fuel, LPG and cryogenics. The principles for safe bulk fuel, LPG and cryogenic tanker deliveries are based on:

a. To prevent injury to personnel during entry and exit (vehicle movements).

b. To provide segregation form other vehicles.

c. To prevent injury to personnel during bulk offloading/receipt activities.

d. To prevent damage to the environment during offloading / bulk receipt activities.

e. To be provided with an unimpeded forward escape route in case of an emergency.

Guidance Material

General Guidance

4. Tanker delivery areas should be well ventilated. The RTDS should be in the open, away from: buildings, dispensing activities and emergency escape routes. It should be large enough to allow a road tanker to be positioned wholly within it during delivery (L133).

5. Road tanker delivery areas should be segregated from other processes/activities.

6. Tanker deliveries should be carried out on dedicated compliant road tanker delivery areas. The road tanker surface area, usually measuring 15 m by 5 m should be suitable for the axle loading of a fully laden tanker, shall be impervious and shall not have any adverse chemical reaction as the result of any spilled product. In particular:

a. Tarmac surfaces may soften when subjected to spilled hydrocarbon products (APEA Blue Book).

b. LOx can spontaneously ignite / combust when in contact with oils and greases, including Tarmac surfaces (BCGA 36 App 4, UKLPG COP 1 Art 7.3.3.5).

7. Where road tanker deliveries take place on non-complaint tanker delivery areas (e.g. SAR refuelling sites, deployable refuelling facilities on operations or exercise), appropriate DSEAR, OHSE, and Environmental Risk Assessments must be carried out for the delivery, storage and issue of fuel/LPG/cryogenic liquid.

8. If 24 Hr deliveries take place, adequate illumination should be provided to enable unloading to be carried out safely outside daylight hours. These include the tanker unloading point and, where applicable, at the above-ground fill point enclosure (cabinet). Artificial illumination may also be necessary at sites where natural light is

obstructed in some way. A luminance of a minimum of 100 lux at ground level would normally be considered adequate.(APEA Blue Book)

9. The location chosen should allow for the road tanker to gain access without the need to reverse onto the site and should also provide a clear exit route in a forward direction. (APEA Blue Book)

10. The road tanker discharge area should be substantially level, but also be laid to fall towards the tank fill points, thereby preventing any spillage from migrating underneath the tanker. Adequate drainage channels/gullies should be provided adjacent to the tank fill points to accommodate a likely spillage and be suitably designed to intercept the largest likely spillage.

11. The likely largest spillage for Fuels and Lubricants (F&L) is based on a worst case spillage event of 2 hoses failing at 1000L per minute for 4 minutes. The tanker stand should be capable of holding the residue until such time the drainage system can accept and convey the product to the Oil Water Separator (OWS). It is recommended the OWS be fitted with a shut off valve to prevent product migrating downstream.

12. For cryogenic liquids, spillages are most likely to occur during bulk deliveries and receipts. As cryogenic liquids are heavier than air, they are capable of migrating to low level areas such as drains. Therefore tanker delivery areas should be free of open drains, gullies, pits and depressions within the separation distances stated in BCGA CP 36, Appendix 3 & 4.

13. For LPG, spillages are most likely to occur during bulk deliveries and receipts. As LPG is heavier than air, it is capable of migrating to low level areas such as drains. Therefore tanker delivery areas should be free of open drains, gullies, pits and depressions within the separation distances stated in UKLPGA CoP 1, Part 1, Section 2.

14. Open drains, gullies or ducts located within the separation distance, which would permit access and passage of cryogenic liquids and LPG vapours should be fitted with a water trap or be otherwise suitable sealed. (UKLPG COP 1 Art 2.5.1.3, BCGA COP 36 Art 4.3 and 8.2)

Further Guidance and References

15. Safe tanker delivery procedures in petrol filling stations are detailed further in the Petroleum Enforcement Liaison Group (PELG) publication Petrol Filling Stations Guidance on Managing, The Risks of Explosion (The Red Guide).

16. The Association for Petroleum and Explosives Association (APEA) publication, Design Construction Modification Maintenance and Decommissioning of Filling Stations (The APEA Blue Book) is the

Industry Code of Practice for the petrol retail industry and details the design requirements for a dedicated petrol tanker delivery stand and recommended drainage capacities.

17. UKLPG COP 1, Part 1 is the LPG distributors Industry Code of Practice and details the suitable siting of bulk LPG road tanker offloading facilities.

18. The British Compressed Gas Association (BCGA) CoP 36 Cryogenic Liquid Storage at Users' Premises provides detailed guidance for the construction and layout for cryogenic delivery vehicle stands.

19. A leak during a bulk fuel delivery has the potential to cause environmental damage and is referenced in the Water Resources Act 1991 and subsequent Environmental Protection Regulations, (Environmental Permitting Regulations (England and Wales) 2010 (EPR 2010) (Scotland and Northern have similar legislation). Having a compliant delivery stand, robust operating procedures, competent operators and practiced emergency procedures should demonstrate that all risks are to an ALARP level.

20. Discharges into surface waters and groundwater (the water environment) are controlled by the EPR 2010. These regulations apply to all direct contaminated discharges into surface waters or groundwater, and to discharges into groundwater via soakaways. Environment Regulators do not automatically grant a permit and, in environmentally sensitive areas, may refuse to grant a permit to protect the environment.

21. All discharges to the public sewers (foul or surface water) require prior authorisation from the local sewer provider and may be subject to the terms and conditions of a trade effluent consent or trade effluent agreement.

22. The Environmental Damage Regulations (EDR) or Environmental Liability Regulations (ELR) apply if serious environmental damage occurs or there's a risk of such damage as a result of economic activity damage occurring. Further definition of these terms:

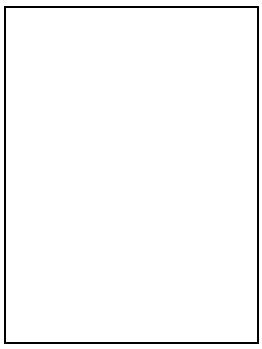
a. "Economic activity" includes activities carried out by public sector and government departments or agencies.

b. "Environmental damage" is considered to be:

(1) Serious damage to surface water or groundwater.

(2) Contamination of land where there is a significant risk to human health.

(3) Serious damage to EU protected natural habitats and



species or damage to Sites of Special Scientific Interest (SSSIs) in England and Wales or Areas of Special Scientific Interest (ASSIs) in Northern Ireland.

23. These regulations follow the 'polluter pays' principle. If MOD activities threaten to cause, or have caused environmental damage, the Duty Holder must take steps to prevent the damage (or further damage) occurring. The Duty Holder must tell the Environment Regulator about the damage; who will then advise the Duty Holder what to do to prevent and/or remedy it.