



Defence
Safety
Authority

DSA 03 DLSR
Fuel and Gas Safety and
Environmental Regulations
Defence Codes of Practice
(DCOP)
(Previously JSP 309)

Fuel and Gas Safety
Regulator

Defence Land Safety
Regulator

DLSR

Amendment Table

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Defence Codes of Practice

Introduction

1. The Ministry of Defence has a duty to protect its employees, those that may be affected by its activities and the environment. Effective Safety and Environmental Protection (S&EP) is also important, as their effective management is crucial to force protection and maximising operational capability.
2. FGSR Defence Codes of Practice (DCOPs) are to be read in conjunction with the Defence Regulations contained in DSA 02 Fuel and Gas Safety and Environmental Regulations. Due to the cross cutting nature of F&GS activity, full consideration shall be given to the regulatory requirements of other Defence Regulators.
3. The DCOPs provide practical advice on how to comply with a regulation. They are designed to clarify legislative requirements, set Defence standards and identify roles and responsibilities. DCOPs provide Defence regulatory advice, which if followed, will be considered sufficient to demonstrate compliance. Guidance material may also be included which, whilst not compulsory, may also be considered 'good practice' to further support the Regulations and DCOPs.
4. Alternative approaches may be utilised where they produces outcomes as good as those required by the regulation. Justification may be required when alternative approaches are employed, and the requirements and advice contained in a DCOP may be used as evidence during Enforcement action. Where alternative approaches have been implemented, the onus will be on those holding safety and environmental responsibilities to prove that actions undertaken produced an outcome that meets the requirements of the regulations.
5. The Defence Code of Practice 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. Each Regulation may contain a number of Sub-Clauses that are pertinent to that Regulation. <i>(There may be more than one Regulation referenced)</i>
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

Provides Guidance Material, which, whilst not compulsory, may be considered 'good practice' to further support the Regulations and DCOPs.

Regulations

6. In order to manage F&GS safety arrangements integrally with other safety and environmental management processes as part of a system of systems, due consideration shall be given to the regulatory requirements of other Defence Regulators.

7. 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 provide an equally safe outcome

Regulation 1 Safety Management System (SMS)

Regulation	Those operating on Fuel & Gas Storage (F&GS) facilities shall implement a suitable and sufficient Safety Management System to manage the fuel and gas safety risks.
Rationale	The Policy Statement by the Secretary of State (SofS) for Defence for Health, Safety and Environmental Protection (HS&EP) in Defence dictates that those who deliver or conduct defence activities are to minimise work-related fatalities, ill-health and reduce health and safety risks so that they are As Low As Reasonably Practicable (ALARP). To ensure that safety procedures are effective, appropriate and transparent, the MOD implements Safety Management Systems (SMS).
Defence Code of Practice (DCOP)	<ol style="list-style-type: none">1. Bulk fuel storage represents a significant risk in terms of health and safety. Likewise, certain gases and their containers represent significant risks which need to be controlled. In order for a site to be certified as fit for continued operation, it must be able to demonstrate that it has systems in place to identify and adequately control these risks. The MOD Health and Safety system, as described in JSP 375, is aligned to the structure and principles of the HSE recognised safety management system HSG 65.2. Safety management systems are required to address risk in a manner that is appropriate and proportionate to the organisation and to the activities being carried out. The key elements are as follows:<ol style="list-style-type: none">a. Applicable legislation, Defence regulations, policy and guidance. <i>(DSRPs, JSPs)</i>b. Information management. <i>(DSA 02 and 03 - Regs 1-10)</i>c. Organisational leadership, culture, capability and change management. <i>(Reg 6)</i>d. Personnel competence and training. <i>(Reg 7)</i>e. Risk assessments and safety cases. <i>(Reg 3 & 5)</i>f. Design and manufacture. <i>(Reg 8)</i>g. Maintenance. <i>(Reg 9)</i>h. Supervision and control of activities. <i>(Reg 6)</i>i. Incident management and learning from experience. <i>(Reg 4)</i>j. Emergency arrangements. <i>(Reg 4)</i>k. Self-assurance. <i>(Reg 9)</i>3. The majority of safety issues can be directly or indirectly related to one or more of the elements listed above. The Regulations within DSA 02 <i>(blue italic)</i> are designed to address these elements. An organisation's arrangements for Health and Safety should be a comprehensive whole-site management system for which Fuel and Gas storage is only one part. The FGSR Fuel & Gas Safety Assurance Assessment (FGSAA) seeks to verify that the unit has arrangements in place, and that fuel and gas hazards are correctly identified and controlled within the scope of that SMS.

4. The SMS should be owned by the unit, and is usually administered by the site/unit Health and Safety representative. Fuel and gas managers must know their responsibilities with regards to site Health and Safety and should have a working knowledge of the SMS.

5. The starting point of an SMS is to examine and assess all activities for their associated hazards. If the hazards are deemed to be significant, they shall be formally risk assessed. The FGSA typically examines 5 types of risk assessment:

- a) Site Hazard Survey/Risk Assessment.
- b) Activity Risk Assessment
- c) COSHH Risk Assessment
- d) DSEAR Risk Assessment
- e) Lightning Risk Assessment

6. FGSR seeks to ensure that the above risk assessments are suitable and sufficient for the risks posed by fuel and gas storage and that risks are adequately controlled and mitigated. Mitigation can take the form of operating procedures, infrastructure, Planned Preventative Maintenance (PPM), training and spill response. (Risk Assessments are covered in greater detail in Regulations 3 and 5).

7. Once SMS processes are established it is necessary to ensure that they are effective and that they remain so. 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.

8. In summary, whilst it is not specifically a Fuel Management function to devise and implement an SMS, it is crucial that fuel and gas Managers are actively involved in the risk assessment process, notify the SMS owner of the fuel and gas hazards and risks, and are responsible for their activities. In particular, the measures for ensuring Health and Safety are to be suitable and sufficient, documented, actively practiced and regularly reviewed.

**Guidance
Material**

9. JSP 375 is the lead Departmental publication for health & safety in Defence under the SofS's Policy Statement for HS&EP and DSA 01.1. JSP 375 is sponsored by DG DSA, and is produced and maintained in consultation with stakeholders by DSA Corporate Policy and Assurance (CPA).

10. In the UK the Health and Safety Executive (HSE) publish Approved Codes of Practice (ACOPs) for a very wide range of Health and Safety topics. ACOPs interpret legislation and provide guidance on the minimum requirements to conform to the appropriate legislation for a given subject.

Regulation 2: Environmental Management Systems

Regulation	<p>Those operating on Fuel & Gas Storage (F&GS) facilities shall implement a suitable and sufficient Environmental Management System to manage the fuel and gas environmental risks.</p>
Rationale	<p>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).</p>
Defence Code of Practice (DCOP)	<ol style="list-style-type: none"> 1. 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. 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. 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. Whilst there are various types of EMS in common use, they all follow the same "PLAN, DO, CHECK, REVIEW" cycle. <div data-bbox="667 1196 1203 1420" data-label="Diagram"> <pre> graph TD Plan[Plan] --> Do[Do] Do --> Check[Check] Check --> Review[Review] Review --> Plan </pre> </div> 3. An EMS is a comprehensive whole-site management system for which fuel and gas storage is only one part. The FGSR Fuel & Gas Safety Assurance Assessment (FGSAA) seeks to verify that the unit has an EMS, and that fuel and gas hazards are correctly identified and controlled. 4. 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 must know their EMS responsibilities. 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 a greenhouse gas 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 further reinforced by Defence Regulations, Reg 4).

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. A valuable source of information relevant to USRP is 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.

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. There are many types of EMS standard available, such as ISO 14001, European Commission Eco-Management and Audit Scheme (EMAS) and the British Standard (BS) 8555. MoD examples include Environmental Management System Army Sites (EMSAS). Despite variations in content, they all follow the same “PLAN, DO, CHECK, REVIEW” cycle.

12. JSP 418 is the MOD publication that provides full guidance on EMS. This Regulation, and other references to EMS within this document are subordinate to JSP 418 in this respect.

13. National Environment Regulators (e.g. EA, SEPA) have previously published Groundwater Protection Codes of Practice for the storage of petroleum/liquid hydrocarbon in underground storage tank facilities. Some of these codes are no longer supported by the EA (i.e. PPG03) but are still readily available and continue to be considered best practice by industry and other Regional Agencies

Regulation 3: Risk Assessments

Regulation	Those operating on Fuel & Gas Storage (F&GS) facilities must complete suitable and sufficient Risk Assessments for all processes and activities involving gases, fuel and lubricants, which shall be reviewed on a regular basis. Where a risk assessment identifies a requirement, the finding shall be acted upon.
Rationale	<p>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</p> <p>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.</p> <p>DSA 01.1 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 particular Vol.1 Chapter 8 & Vol.3 Chap 5).</p>
Defence Code of Practice (DCOP)	<ol style="list-style-type: none">1. All modern safety and environmental management systems are based on the accurate assessment and control of risk. This fundamental principle establishes the conditions that ensure compliance with the Regulations laid out within this DSA. In order for a site to be certified as fit for continued operation, it must be able to demonstrate that it has systems in place to identify and adequately control all significant risks.2. Although there are different risk assessments for different aspects of operation, they should follow the same 5-step philosophy. These steps are as follows:<ol style="list-style-type: none">a) Identify the Hazardb) Identify who might be harmed and howc) Evaluate the risks and decide on control measuresd) Record and implement findingse) Review the assessment and update if necessary on a regular basis.3. Similarly, when risks are identified, there are five methods by which the risks are to be managed. These are set in a hierarchy as follows:

- a) Eliminate/Reduce (removing the hazard will remove the risk)
- b) Substitute (replace the hazard with less hazardous process)
- c) Isolate/Guard against (railings, guards etc)
- d) Set Procedure (rules and training)
- e) Protect those at risk (PPE)

4. **Competence:** Risk assessments must be carried out by a competent person or persons. Failure to employ persons 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. Once complete, 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.

5. **Review:** Risk assessments should be reviewed at regular intervals or when there is a significant change in the process and/or infrastructure. When examining any form of risk assessment process (COSHH, DSEAR etc), FGSR inspectors look for evidence of adherence to the methodologies described above.

6. **Types of Risk Assessment:** 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 and the toxicity hazards presented by the gases themselves. In the course of their inspections, FGSR will typically examine 5 types of safety risk assessment. These are as follows:

- a) Site Hazard Survey/Risk Assessment
- b) Activity Risk Assessment (incl. emergencies, fire etc)
- c) COSHH Risk Assessment
- d) DSEAR Risk Assessment
- e) Lightning Risk Assessment

7. **Site Hazard Survey/Risk Assessment:** This process is carried out at unit command level and is the starting point for all other risk assessments. JSP 375 Vol.1 Chap 8 states:

"Procedures need to be in place to pull together information on significant residual risks from individual activities in support of the normal operation of the defence estate, unit or platform. This information should be evaluated to identify the consolidated risk and used to inform the centrally managed mitigation measures (traffic management, emergency procedures, first aid requirements etc);

FGSR would expect to see an assessment which covers all site hazards/risks but includes the bulk storage of fuels/gases as a noted

residual risk. (MoD establishments typically use Annex B to JSP375 Vol.1 Chap 8 to record site Hazards).

8. **Activity Risk Assessments:** All activities and processes involving the storage and issue of fuels and gases should be adequately risk assessed and documented. Examples of processes include fuel transfer/delivery, fuels testing, vehicles and movements etc. As well as routine procedures, abnormal procedures such as maintenance and unforeseen events such as breakdowns and emergencies should be considered. Although other formats can be acceptable, MOD establishments typically use MoD Form 5010 as described in JSP375 Vol.1 Chap 8.

9. **COSHH:** The Control of Substances Hazardous to Health Regulations (COSHH) requires that all substances which present a health risk are adequately assessed and controlled. Although other systems and formats can be acceptable, MOD establishments typically use the procedure described in JSP375 Vol.1 Chap 11.

10. **DSEAR:** Areas and processes which possess the risk of producing an explosive atmosphere are subject to the requirements of the Dangerous Substances Explosive Atmospheres Regulations (DSEAR). DSEAR requires that such processes are adequately assessed, documented and controlled. The methodology for compliance with DSEAR is covered in more detail in Regulation 5.

11. **Lightning:** A risk assessment is required to determine if the facility is deemed as susceptible to lightning, a verdict of “not applicable” should be documented and justified by a competent authority. If there is a significant risk of lightning, BS EN 62305 is to be consulted to determine the applicability and nature of lightning protection required.

12. In summary, risk assessments are required for all aspects of fuel and gas storage ranging from generic site-wide assessments through to specific activities. Furthermore, certain processes such as COSHH and DSEAR require assessment in order to comply with specific legislation. It is crucial that those responsible for fuel and gas management are actively involved in the risk assessment process, and that the measures identified by assessment are suitable, sufficient and enabled.

Guidance Material

13. There is a significant number of commercial and Defence sources that provide guidance on completing a suitable and sufficient Risk Assessment. The principal MOD publication on Risk assessments is JSP 375. In particular the following chapters are relevant:

- a) JSP375 Vol.1 Chap 8 Risk Assessment

- b) JSP375 Vol.1 Chap 9 Dangerous Substances and Explosive Atmospheres (DSEAR)
- c) JSP375 Vol.1 Chap 11 Hazardous Substances

14. The primary non-MOD sources of reference are HSE Approved Codes of Practice (ACOPs). Relevant ACOPs include:

- a) L21 - Management of health and safety at work. Management of Health and Safety at Work Regulations 1999. Approved Code of Practice and guidance
- b) L5 - Control of substances hazardous to health (Sixth edition)
- c) L138 - Dangerous Substances and Explosive Atmospheres Regulations 2002. Approved Code of Practice and guidance.

15. Other useful documents

Control of Major Accident Hazards (COMAH) Buncefield report. The underlying causes of the explosion and fire at the Buncefield oil storage depot, Hemel Hempstead, Hertfordshire on 11 Dec 2005.

Regulation 4: Emergency Arrangements

Regulation	<p>Those operating on Fuel & Gas Storage (F&GS) facilities must produce suitable and sufficient Unit Emergency Arrangements</p>
Rationale	<p>All facilities which store hazardous substances such as fuel and gas hold an inherent risk of an incident which may result in risk to life and / or 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 and gas products to have emergency / contingency arrangements in place. Such arrangements include; fire plans, gas leak plans and fuel spillage response plans. The MOD recognises the importance of having effective emergency arrangements and seeks to promote a standard model throughout the MOD estate. The Comprehensive Fire Plan, Unit Spill Response Plan (USRP), and Gas Emergency Escape Plan (GEEP) describe these procedures.</p>
Defence Code of Practice (DCOP)	<p>Introduction</p> <ol style="list-style-type: none"> 1. All MOD establishments which handle bulk¹ fuels/and gases must have emergency arrangements. The requirement for emergency arrangements is a mandatory requirement iaw DSEAR (arrangements to deal with accidents incidents and emergencies) in the Fuel Gas Safety Assurance Assessment (FGSAA) to allow a MOD fuel / gas facility to be Certified As Fit For Continued Operation. 2. Emergency arrangements are a part of DSEAR for establishments storing bulk F&L and gases. General fire safety requirements in the workplace are applied through the Regulatory Reform (Fire Safety) Order 2005 and compliment DSEAR Regulations. Emergency arrangements should dictate the scale and nature of the USRP so that the response is targeted and proportionate to the risk, as well as analysing data from any previous accidents, emergencies, spillages and exercises on site. 3. Emergency arrangements shall identify the potential for incidents and accurately describe the actions needed to provide an effective response. 4. Emergency arrangements shall identify the personnel and equipment needed to respond to the incident, and their specific roles.

¹ Bulk Fuel storage- defined as stored fuel not directly used as a supply for motive / generation power. Fuel stored in a single container >275 Litres, or stored in infrastructure (including JOFS) irrespective of size.

5. Emergency arrangements shall include the provision of appropriate first aid facilities² and relevant safety drills (which shall be tested at regular intervals).

6. Emergency arrangements shall make readily available suitable information, warning and other communication systems to enable an appropriate response to be made immediately when such an event occurs.

7. Emergency arrangements shall ensure that where the site risk assessment indicates it is necessary to escape, facilities are provided and maintained so that personnel can escape to a safe place promptly and quickly.

8. In some instances these plans may form part of a larger emergency incident plan (MACR– JSP 498 or 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. If a spill could enter the sea from a MOD site operating on a shoreline, or within a location managed under Naval Base Queens Harbour Master (QHM) / civilian Harbour Master, then other legislation will be affected i.e. MARPOL / International Convention on Oil Pollution Preparedness, Response and Co-operation (OPRC).

Specialist advice

9. In developing an emergency plan, 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.

² First aid facilities relevant to the process involved e.g. PCS for F&L spills, fire extinguishers for fires etc.

- h) External agencies, such as local emergency services, Harbour Masters, Naval QHM or the MOD contractor for Emergency Pollution Response Service.

Format of Emergency Plans

10. **Standardised format.** Emergency Plans should be produced to a standard format, and worked examples are found at the FGSR –DSA 02 website. The key points concerning the suggested format are:

- a) The standard format is a framework – information contained within the framework of emergency plans 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 emergency procedures 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 (COMAH / MAPP/SR, QHM Tier 2 shoreline spillage response plans).
- 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 the appropriate language and easily understood. The plan should be assessed against human factors 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 plan may be distributed outside the MOD to agencies who are not familiar with MOD writing conventions.
- e) The plan should be disseminated to all stakeholders and if required be dovetailed into larger emergency plans when emergencies escalate or when the site is part of a larger enterprise, (harbour front, garrison etc).

Training and exercises

11. For an emergency plan to be effective all personnel that will be involved must fully understand their responsibilities and be 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 emergency (spill response) exercises which can range from an in-unit desktop study through to a

	<p>full deployment of personnel and equipment with interfaces with outside agencies (emergency services).</p> <p>Plan Review/Amendment.</p> <p>12. 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.</p> <p>Records and Reporting.</p> <p>13. 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 Health and Safety Officer is responsible for maintaining records. Some incidents may require reporting under RIDDOR or MACR/COMAH.</p>
<p>Guidance Material</p>	<p>14. JSP 418 provides further guidance on aspects of Environmental Protection, in particular: Environmental Management Systems and Pollution Prevention.</p> <p>15. FGSR DSA 02 intranet homepage provides supporting document templates – for fuel spillages (Unit Spillage Response Plan), Fire Plans, and Gas emergency plans (Gas Emergency Escape Plans).</p> <p>16. DIO has published a suite of documents relating to gas safety within the MOD estate (DIO policy instruction PI 2015/06). The DIO Gas Safety Case mandates that site specific gas emergency plans shall be published by the Maintenance Management Organisations (MMOs).</p> <p>17. JSP 317 provides guidance for the relationship (hierarchy) between shoreline Unit spill response plans and adjacent QHM / Statutory Harbour Master spillage plans.</p> <p>18. JSP 426 – Defence Fire Safety and Fire Risk Management, provides direction and guidance for fire safety and hierarchy of fire risk assessments on the MOD Estate.</p> <p>19. COMAH Standards.</p>

Regulation 5: Dangerous Substances and Explosive Atmosphere Regulations (DSEAR)

<p>Regulation</p>	<p>Those operating on Fuel & Gas Storage (F&GS) facilities must complete a suitable and sufficient Risk Assessment that complies with the Dangerous Substances and Explosive Atmospheres Regulations (DSEAR).</p> <p>If the findings of the risk assessment identify sufficient risk then a plan that identifies the hazardous areas must be implemented. The plan must also 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.</p>
<p>Rationale</p>	<p>The Dangerous Substances & Explosive Atmospheres Regulations 2002 (DSEAR 02) aims to protect the safety of workers and others that may be at risk from dangerous substances that can cause fire or explosion. The MOD must meet these statutory requirements by undertaking suitable and sufficient DSEAR risk assessments. The results of these assessments must be recorded, communicated and acted upon as necessary.</p>
<p>Defence Code of Practice (DCOP)</p>	<ol style="list-style-type: none"> 1. Fuel, in either gas or liquid form, is a volatile flammable substance. Many non-fuel gases are flammable, explosive or promotes ignition by nature. Therefore all processes/activities involving Fuel, Lubricants, Oxygen and flammable gases are potential hazardous activities. The definition of processes/activities in this case includes normal operations, storage, handling, distribution, and maintenance of systems/plant as well as abnormal conditions (such as commissioning/decommissioning, change of product, extremes of weather etc.) 2. Satisfying the requirement of Defence Regulation 5 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. 3. The procedures for identifying DSEAR hazards and subsequent implementation of risk assessments are detailed in JSP 375 Part 2 Vol.1 Chap 9. 4. For Fuel and Gas installations the DSEAR assessment process is as follows: <ol style="list-style-type: none"> a) Any process or activity with the potential to create an explosive atmosphere is subject to DSEAR regulations, and must undertake a Stage 1 DSEAR Risk Assessment. The Stage 1 assessment ascertains if a full DSEAR Assessment is required.

b) If the Stage 1 DSEAR Risk Assessment identifies a possibility of dangerous substances or processes that may result in an explosive atmosphere, then a Stage 2 DSEAR Risk Assessment is required. The Stage 2 assessment assesses the fire and explosion risks that may result and will determine the risk reduction measures taken.

c) Risks and risk reduction measures should be described within an Explosion Protection Document. This document typically includes:

- (1) Technical or organizational measures so as to reduce or prevent the risk of explosions (as set out in Schedule 2) and measures used to mitigate the effects of an explosion.
- (2) The operation of early warning devices
- (3) Operational procedures, maintenance, operation of permits to work, and co-ordination between employers
- (4) Area classification reports & zonal drawings. (*Drawings should be accurate to the site in question, show plan and elevation views and include anything relevant to or encroaching upon the zone*);
- (5) Means of escape in the event of an explosion risk assessments;
- (6) Restrictions on the type of protection method employed;
- (7) Calculations (ventilation rates, Intrinsically Safe circuits etc);
- (8) Material safety data sheets;
- (9) Equipment design data (Gas Group, Temperature Class, Zone suitability);
- (10) Equipment certificates (EX rating);
- (11) A complete register of all EX equipment in hazardous zones.

The above list is not exhaustive, but risk reduction measures should be proportionate to the level of risk and the scope of the document should reflect this.

5. The Explosion Protection Document provides the evidence necessary to show that a facility is DSEAR compliant, and is to be made available during FGSR inspections.

6. In addition to the above, gas installations have the following considerations:

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. **Bulk LPG.** Bulk LPG facilities including delivery areas fall within the scope of DSEAR 02 therefore a stage 2 risk assessment shall be carried out.

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 the definition of explosive atmosphere within DSEAR 02, it is subject to codes of practice regarding ingress protection (IP) that contribute to a safe environment that compliments DSEAR. The Site Safety Case or Site Risk Assessment should consider the presence of liquid oxygen and the safety management system must recognise the interaction between these hazardous regimes.

7. 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 all drawings to be site specific.

8. DSEAR risk assessment must be reviewed on an annual basis and if there is a change to infrastructure/product/process. Once completed all documentation must be held and displayed on site.

Guidance Material

9. JSP 375 – Management of Health and Safety in Defence, Part.2 Volume 1, Chapter 9 mandates the requirement to complete Stage 1 and Stage 2 DSEAR Risk Assessments.

10. In the UK the Health and Safety Executive (HSE) publish Approved Codes of Practice (ACOPs) for a very wide range of Health and Safety topics. ACOPs interpret legislation and provide guidance on the minimum requirements to conform to the appropriate legislation for a given subject. For DSEAR, guidance can be found in L138: Dangerous Substances and Explosive Atmospheres Regulations 2002. Approved Code of Practice and Guidance.

11. Further guidance on hazardous areas and zones can be found in Energy Institute (EI) Model code of Safe Practice Part 15 Area classification for installations handling flammable fluids.

12. The professional body for the petroleum storage (including LPG) industry on retail petrol forecourts is the Association for Petroleum and Explosives (APEA).

13. The professional body for the bulk and cylinder storage of LPG and industrial gases is the UKLPG Association and the British Compressed Gas Association (BCGA) respectively.

Regulation 6: Roles and Responsibilities

Regulation	Those operating on Fuel & Gas Storage (F&GS) facilities shall appoint appropriate persons to manage and facilitate on behalf of the Duty Holder. All staff with responsibilities are to have their roles and responsibilities formally arranged so that they are clear and understood by both the person and the staff who interact with them
Rationale	The administration of bulk fuels and gas facilities is contained within JSP 375, JSP 317 and JSP 319 and managed through a hierarchical structure. Some of the roles are carried out within the MOD and some by industry partners who are engaged to undertake the operation, maintenance and upkeep of the estate. It is important that structures are adequately defined to ensure key elements of H&S are not overlooked
Defence Code of Practice (DCOP)	<ol style="list-style-type: none">1. There is a legal requirement for TLBHs/CEs, Line Managers, Commanding Officers and Heads of Establishment, and anyone else with responsibilities for managing Defence activities comply with UK legislation in managing HS&EP risk. Further details on these requirements are provided in DSA 01.1 and DSA 01.2.2. The roles of key personalities in the operation and maintenance of fuel and gas sites are outlined below. A more detailed list of responsibilities may be found in JSP 375.3. Operating Authority (OA). OA is a responsibility given to the HoE specifically for petroleum installations. Responsibility for the safe and proper operation of petroleum installations rests with the HoE; authority, but not responsibility, may be formally delegated to an appropriate person who may carry out tasks on behalf of the HoE (see Annex C). The OA is required to exercise duty of care over all activities at the installations. Where any infrastructure or related work is required, liaison, control and 'hand-over' of the facility is to be done in accordance with processes contained within JSP 375 Part 2 Vol 3 Chap 5; this also contains further details of the OA duties.4. DIO Representative. The DIO Representative acts as an interface between HoE and DIO. They are responsible for the management of infrastructure maintenance and projects for a geographical area or in some cases individual units within budgetary constraints.5. Maintenance Management Organisation (MMO). MMOs are Responsible for planning, organising and managing the operation, maintenance and repair of equipment and may include the design and construction of new works. The MMO may be contractor, DIO or military, e.g. Carillion Amey.

6. **Authorising Engineer (AE) / Gas Safety Manager (GSM).** An AE / GSM is a person who has been deemed competent by the Senior Authorising Authorities (SAA) to oversee the application and provide the necessary assurances of adequate implementation of a specific discipline within JSP 375 Pt 2 Volume 3. The AE / GSM community provide the primary audit function within the Safety Management System along with high level implementation of the rules and procedures and assessment of competence across an estate delivery area.

7. **Professional Inspector (PI).** Professional Inspectors are selected by DIO and are responsible for the completion of annual engineer inspections of fuel and gas sites through implementation of the Practitioner Guide 06/12 inspection. This provides the technical information required to authorise the safe, continued operation of fuel sites and informs some of the findings of the FGSAA.

8. **Authorised / Responsible Person.** An AP/ RP is a person who has been deemed competent by the AE / GSM and appointed by the MMO to undertake the practical implementation of a specific discipline (Chapter) of JSP 375 Pt 2 Volume 3 for the defined area of appointment. The APs / RPs implement the rules and procedures at site level and are responsible for the control of activities through the issue of Safety Documentation.

9. **516 Specialist Team Royal Engineers (STRE).** 516 STRE are the design authority for Joint Operational Fuel System sites and provide the AE and AP function. They are responsible for ensuring commissioning, decommissioning and maintenance of the site are completed safely.

10. **Fuel and Lubricants (F&L) Manager.** Sites operating fuel and gas infrastructure shall have a person appointed and suitably trained to oversee fuel operations. This person may be military or civilian, but shall have completed the appropriate F&L Managers' Course as stated in JSP 317.

11. **Installation Operator.** Operators' duties include receipt and issue of fuel, fuel quality testing, and replenishment of PPE and PCS stocks, tank dipping as required, wet stock management, site husbandry, and reporting of any infrastructure failures. Installation Operators are appointed by the F&L Manager and their competence is certified using JSP 317 Part 1 Chapter 8 Annex A.

**Guidance
Material**

12. More detail on the roles and responsibilities above may be found in [JSP 375 Part 2 Volume 3 Chapter 2](#) and [JSP 317 Part 1 Chapter 8](#)

Regulation 7: Training and Competence

Regulation	Those operating on Fuel & Gas Storage (F&GS) facilities must only allow personnel who are suitably trained, qualified, experienced and competent to operate the facility; This requirement must be formally managed and documented to ensure compliance
Rationale	<p>The Health and Safety at Work Act 1974 (HSWA) requires the employer to provide suitable and sufficient information, instruction, training and supervision as is necessary to ensure the health and safety of employees.</p> <p>Furthermore, the Provision and Use of Work Equipment Regulations (PUWER) requires that employers must <i>'ensure that all persons who use work equipment have received adequate training for the purposes of health and safety, including training in the methods which may be adopted when using work equipment, and risks which such use may entail and the precautions to be taken.'</i> There is a similar duty to ensure adequate training in relation to supervisory and managerial staff.</p> <p>In order to comply with legislation, MOD implements management systems to ensure that staff are deemed to be Suitably Qualified and Experienced Personnel (SQEP) to perform their tasks safely</p>
Defence Code of Practice (DCOP)	<ol style="list-style-type: none">1. Personnel operating fuel and gas facilities shall be suitably trained and competent to perform their roles. This is a mandatory requirement for MOD fuel and gas facilities to be certified as Fit for Continued Operation.2. The nature and depth of training will depend on the type of facility and the role in question. Types of training may be formal (i.e. classroom based), informal, (such as in-house briefs and Toolbox Talks) or experiential (“on the job”).3. If a given role is safety critical then the training requirements will be mandatory, and evidence of competence will be required. In the case of formal training the evidence may be in the form of a Training Certificate. Examples of formal mandated training include:<ol style="list-style-type: none">a) Fuel & Lubricant (F&L) Managerb) Authorised / Responsible Person (AP) / (RP) Authorising Engineer (AE)4. With mandatory informal training, or assessment of experience, the evidence may be a written statement (i.e. Certificate of Competence). For example, all Fuel Operators shall have a Certificate of Competence in place prior to operating a bulk fuel facility. Certificates of Competence must be certified by the relevant competent personnel listed in JSP 317.

5. A typical Certificate of Competence for an F&L operator, gas compound manager is compiled of a series of training requirements which the nominee must complete in order to be deemed competent. An example of a Certificate of Competence is available in JSP 317.

6. Training requirements and currency of SQEP shall be reviewed every 12 months by the relevant competent personnel listed in JSP 317 and JSP 319.

**Guidance
Material**

7. 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- FGSAA 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.

c. Storage of flammable liquids in tanks – HSG176.

d. Safe use and handling of flammable liquids – HSG140

Regulation 8: Bulk Fuels and Gases Infrastructure

<p>Regulation</p>	<p>Those operating on Fuel & Gas Storage (F&GS) facilities must ensure the infrastructure facilities are sited, designed, constructed, operated and decommissioned in a manner that is safe, environmentally sound, and fit for purpose. This fitness for purpose must be actively maintained throughout the life of the facility.</p>
<p>Rationale</p>	<p>The Construction (Design and Management) Regulations 2015 (CDM 2015) provides regulations for managing the health, safety and welfare of construction projects and applies to all building and construction work and includes new build, demolition, refurbishment, extensions, conversions, repair and maintenance.</p> <p>Section 2 of the Health and Safety at Work Act requires employers to provide plant and equipment that is safe for employees to use.</p> <p>The Environmental Permitting (England and Wales) Regulations 2010: Regulations 38(1), 12(1) and Schedule 22 state that it is an offence to cause or knowingly permit a water discharge activity and /or groundwater activity unless an environmental permit or exemption is complied with.</p> <p>Defence fuel and industrial gas facilities shall be designed to minimise the risks from fuels and gases to any person and the environment, likely to be at, near, or affected by the products contained within applicable infrastructure including (but not limited to) storage tanks / vessels, delivery / dispense stands, access roadways, drainage systems etc.</p> <p>Defence fuel and industrial gas facilities, shall encompass the philosophy of a through life concept, whereby all aspects of the infrastructure from initial concept, design, in-service life, site closure and decommissioning are considered</p>
<p>Defence Code of Practice (DCOP)</p>	<p>Siting</p> <p>1. The environment, adjacent activities and adjacent properties, shall be considered as part of the planning process and suitable risk assessments shall be conducted to determine appropriate safe separation distances for bulk fuels, bulk gases, and gas cylinder storage sites.</p> <p>Design / Construction</p> <p>2. To ensure mechanical integrity and environmental compliance, defence fuel and industrial gas facilities shall be designed and constructed in accordance with a Defence, British, European, national, or international standard.</p>

3. The materials used in the construction of defence fuel and industrial gas facilities should be compatible with the chemical and physical properties of the liquid / gas to ensure that no interaction occurs which might cause failure of the infrastructure.

Fitness for purpose

4. Defence fuel and industrial gas facilities shall be built and maintained to appropriate standards and be able to operate under all foreseeable environmental conditions, (e.g. day / night, climate, temperature, local weather conditions).

5. Bulk fuels facilities that have been built and maintained to appropriate standards can be assured as being fit for purpose by holding an in-date fit for purpose certificate issued by DIO as described in Practitioner Guide (PG) 06/12 – Professional Inspection of fuel infrastructure and flammable dangerous goods stores. Failure to hold an in date certificate will render the facility as not fit for purpose.

6. Bulk gas storage facilities and associated systems operating at pressures greater than 0.5 Bar are subject to the Pressure Systems Safety Regulations 2000. An important requirement of these regulations is that the user of the system **must** have a written scheme for periodic examination and a suitable schedule for maintenance shall be in place. Bulk gas storage facilities and associated systems are also supported by the DIO managed Gas Safety Management Plan (GSMP). The Gas Safety Management Plan is a site specific document which records the details of gas infrastructure present at each relevant location as well as the specific arrangements required to be implemented in order to ensure the safe operation and management of such gas infrastructure.

7. Defence fuel and industrial gas facilities shall be designed, maintained, and operated as to provide continued safe compliant operation and shall prevent direct loss of product to the ground, surface watercourse, or to the atmosphere.

Demarcation

8. There shall be clear and concise lines of demarcation that are understood and agreed by all parties with regard to the ownership, operation, and maintenance of defence fuel and industrial gas facilities that are owned, managed and maintained on the MOD estate. Examples being (but not limited to) bulk LPG and cryogenic vessels owned by 3rd party contractors, Aquatrine assets, encroachments, JOFS etc.

9. To summarise, FGSR uses the FGSAA to obtain assurance that the above requirements are in place and that the facility is operating safely.

Guidance Material

10. The APEA - The design, construction, modification, maintenance, and decommissioning of filling stations (APEA Blue Book) provides technical information about storage and dispensing of petroleum products used as fuels for motor vehicles (including petrol, diesel and autogas (also known as LPG). It provides information on civil, mechanical, hydraulic and electrical installation issues for the planning, design, construction, commissioning, modification, maintenance and decommissioning of filling stations, together with information aimed to minimise the risks from fire and explosion, to health and to the environment.
11. EI 15 Design, Construction, Operation, & Maintenance of Aviation Fuelling Facilities provides technical and general information about storage and dispensing of aviation fuels.
12. CIRIA publication C535- Above-ground proprietary prefabricated oil storage tanks systems provides guidance on the design construction and use of manufactured above ground storage tanks of steel or plastic construction. The publication also assesses the level of environmental protection offered by these types of systems against common causes of pollution and the preventative measures that be taken to avoid them.
13. UKLPG CoP 1, Part 1 is the LPG distributors Industry Code of Practice for bulk design, installations and operations of LPG Storage Vessels located above ground. COP 1 Part 4 covers underground and semi buried bulk LPG vessels.
14. The British Compressed Gas Association (BCGA) CoP 36 Cryogenic Liquid Storage at Users' Premises provides detailed guidance for the construction and layout for bulk cryogenic facilities.
15. BCGA CoP 44 and UKLPGA CoP 7 provide technical guidance for the design, construction and siting of industrial and LPG gas cylinders respectively.
16. DIO PG 06 12 Fuel
17. DIO PG 2015/01 Gas
18. Oil storage Regs - Petrol, Guidance
19. F-gas Regs
20. AESP for JOFs- siting Bds, design authority – 516 STRE
21. DIO PG 05/12
22. DIO DMG 14

Regulation 9: Maintenance Inspections & Certification

<p>Regulation</p>	<p>Those operating on Fuel & Gas Storage (F&GS) facilities must ensure that the infrastructure facilities are properly maintained inspected and where necessary, provided with certificates to guarantee that they are fit for continued use, or taken out of service (decommissioned). This is to include an in-date FGSR CCO where applicable.</p> <p>Where fitness for continued use is not possible, those operating Defence fuel and industrial gas facilities must ensure that the facilities are made safe until such time as they are repaired or taken out of service.</p>
<p>Rationale</p>	<p>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 by the Competent Person carrying out maintenance iaw the periodicities mandated by legislation, manufacturers' maintenance instructions and / or DIO maintenance policies / MOD maintenance manuals.</p> <p>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 Defence fuel and industrial gas facilities. FGSR provide assurance that Defence fuel and industrial gas facilities are maintained correctly, are satisfied by process specific procedures, inspection reports, and applicable certificates.</p>
<p>Defence Code of Practice (DCOP)</p>	<p>FGSR Inspections</p> <ol style="list-style-type: none"> 1. 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. If a fuel facility passes the FGSR inspection a Certificate for Continued Operation (CCO) will be issued. The FGSR Certificate is equivalent to the certification regime imposed on civilian petrol storage facilities by the Petroleum Consolidation Regulations (2014). 2. In order prevent wasted resources, a risk based certification regime was implemented giving FGSR inspector's scope to extend the length of licences from annual, to 3 and 5 yearly depending on their scoring against certain criteria. On interim years, suitably qualified and experienced persons within TLBs are authorised to complete self-assessments utilising the FGSAA through the online FGSR database.

Bulk Fuels Facilities

3. PG05/12 (Inspection, Maintenance & Testing of Equipment Installed at Petroleum Installations on MOD Property), DMG 14 (Design Maintenance Guide 14 - MTFIs) and PG 06/12 (Professional Inspection of Fuel Infrastructure and Flammable Dangerous Goods Stores) provide 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. Assurance that bulk fuels installation mechanical maintenance and electrical has been complied with and is up to the appropriate standard carried out by a professionally qualified engineer who conducts a visual inspection of the facility (Professional Inspection of fuel infrastructure and flammable dangerous goods stores). As part of this inspection all relevant certificates and documentation are sighted by the professionally qualified engineer. The certificate produced by the professionally qualified engineer iaw PG 06/12 concludes that the facility will be either:

- a) Fit for continued use – unrestricted (12 months).
- b) Unfit for continued use.
- c) Fit for continued use with recommendations.

Electrical Test Certificate

5. Electricity at Work Regulations 1989 (EWR) 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 prevents danger (Regulation 6). 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 is applicable to all electrical systems within MTFIs; BFIs; bulk waste fuel compounds; (UETFs); Oil (OFDs); and bulk LPG compounds that have an electrical supply. In response to this, an annual electrical inspection must be completed by a competent electrician and be correctly recorded on an appropriate certificate

Non-Destructive Testing / Tank Tightness Tests

6. Defence has no exemption from national legislation set out in the Environmental Protection Act 1990 and the Environmental Damage (Prevention and Remediation) Regulations 2009. As a result, a critical part of the inspection regime must include testing of underground infrastructure deemed to be at enhanced risk. Non-destructive testing of fuel systems has been introduced as a response to the increased risk of environmental damage posed by aging single-skin steel underground fuel infrastructure. Evidence of such tests shall be correctly recorded on an appropriate certificate.

Oil Water Interceptor (OWI) Maintenance

7. OWIs are to be regularly inspected and routinely maintained according to manufacturer's recommendations. The frequency should be determined by site conditions, but as a minimum, inspection is recommended every 6 months, with major servicing every 5 years. Records of OWI maintenance, classification, type, and capacity shall be held by the MMO and be available to the site operator to provide relevant information to support Environmental / Pollution / Emergency Risk Assessments.

Dispenser Pumps

8. Fuel dispenser (metering) pumps are shall be designed / manufactured and placed on the market certified as fit for use iaw Measuring liquid (liquid fuels and lubricants) Regulations 1995 (2006), and shall dispense fuel as to comply with the Weights and Measures Act 1985.

9. Fuel dispensers shall be calibrated by competent persons iaw the periodicities mandated by the respective DIO maintenance publications.

Bulk LPG / Cryogenic Facilities

10. Contractor owned bulk gas vessels are subject to the Pressure Systems Safety Regulations 2000 (PSSR) and are maintained against a Written Scheme of Examination (WSE). This is demonstrated by the appropriate data plate on the vessel being annotated by the current inspection date. The Vessel Owner maintains all records for vessel maintenance.

11. MOD (RAF) owned cryogenic vessels are maintained iaw Air Publication maintenance manuals. Evidence that RAF cryogenic vessels are serviceable is usually supported by an appropriately annotated MF 731 label.

12. Bulk LPG vessel supporting infrastructure is maintained by MOD Competent Persons (MMO). All maintenance records and applicable certification is managed iaw DIO GSMP Part C, and DIO PG 2015/01.

13. Infrastructure supporting bulk cryogenic facilities is maintained by MOD Competent Persons (MMO). All maintenance records and applicable certification is managed iaw DIO policy. (e.g. LEV, MGI certificates).

Gas Cylinders

14. Gas cylinders (Transportable pressure vessels) are generally Contractor owned and are subject to a 10 yearly Periodic Inspection and Test regime as mandated by the Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations (CDG). This is demonstrated by cylinder test rings and data being stamped on the cylinder vessel shoulder.

Decommissioned sites

15. All sites that are either temporary or permanently decommissioned shall be certified, demonstrating that the site has been closed safely, and in accordance with all appropriate H&S and environmental legislation.

Guidance Material

Bulk Fuels Facilities

16. Further information on the Inspection, Maintenance & testing of equipment installed at Petroleum Installations on MoD property can be found in PG 05/12 and DMG 14-; DIO Professional Inspection can be found in PG06/12.

17. APEA Design, construction, modification, maintenance, and decommissioning of filling stations (APEA “Blue Book”) provides guidance on the maintenance of petrol filling stations including all associated ancillary equipment.

18. BS-EN 858 Part 2, APEA “The Blue Book” and EI Guidelines for soil, groundwater, and surface water protection and vapour emission control at petrol filling stations provide guidance on OWI classification and maintenance requirements.

19. DIO TFM Briefing Note 012 Good Practice Guide No 1 – Fuels Infrastructure provides guidance on how the MMO conducts maintenance on Bulk Fuels facilities & the requirements of the MMO needs to carry out prior to and during the Professional Inspectors Audit. DIO TFM Briefing Note 012 Good Practice Guide No 1 also provides

guidance that the Professional Inspectors shall conduct a post inspection debrief to all site stakeholders prior to departing the site.

Bulk LPG / Cryogenic Facilities

20. DIO Gas Safety Management Plan Part C and PG 2015/01 provide guidance on management and maintenance regimes for bulk LPG facilities on the MOD estate.

21. UKLPGA CoP 1 Part 1, Part 3 provides guidance on design and maintenance requirements of bulk LPG vessels and enclosures.

22. BCGA Cop 36 provides guidance on design and construction of bulk cryogenic enclosures.

23. BOC Customer Engineering Services PN 1959 provides relevant certification for BOC owned cryogenic vessels operated in RAF cryogenic compounds.

24. AP 119 series provides maintenance regimes for MOD owned bulk Cryogenic vessels.

Gas Cylinders

25. The HSE website for approved cylinder design provides guidance on all types of cylinder design, as well as maintenance and inspection regimes. All cylinders are designed, manufactured, and tested iaw European standards and specifications. These are referenced in Chapter 6.2.2 of the 2003 text of RID/ADR .Standards recognised by the competent authorities of Member States as meeting the basic design and construction of RID/ADR may also be used under the Carriage Regulations for the transport and use of transportable pressure equipment throughout the European Union. Standards for UN certified cylinders are those listed in Chapter 6.2.2.1.2, 6.2.2.1.3 and 6.2.2.3 of the latest edition of the UN Model Regulations.

JOFS

26. PG 05/12 is not applicable for installations designed, executed and maintained by Royal Engineers in an operational theatre designated as a military works area (Joint Warfare Publication 4-05).

27. 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 technical publications. The inspection and maintenance regime should be addressed in the engineer design report for the facility. Guidance for suitable written instructions for the workplace are contained in the Provision and Use of Work Equipment Regulations 1998.

28. JSP 317 Part 2 provides guidance on operating procedures for fuels activities.

29. JSP 319 Part 2 provides guidance on operating procedures for industrial gas activities.

Regulation 10: Operations

Regulation	Those operating on Fuel & Gas Storage (F&GS) facilities must ensure that they are in possession of appropriate, current, and concise procedures that detail normal, abnormal, and emergency activities.
Rationale	HASAWA section 2 – mandates that the employer has a Duty of Care for the health and safety of employees by providing information, instruction and training. This is supplemented by MHSW Regulations 1999 and PUWER 1998.
Defence Code of Practice (DCOP)	<ol style="list-style-type: none">1. Those operating Defence fuel and industrial gas facilities must ensure that they are in possession of appropriate, current, and concise procedures that detail normal, abnormal, and emergency activities.2. Standard Operating Procedures are required to ensure that staff are fully aware of the following:<ol style="list-style-type: none">a) The hazards and risks involved in the particular operationb) Roles and Responsibilitiesc) Training Requirements and Competenced) Maintenance Schedulese) Operating instructionsf) How, What and When to do actions, in the event of an emergencyg) The Reporting Chain (including reporting defects)h) Other local arrangements (geography, weather etc)3. Procedures must be devised and written by persons competent in the given role. They must be written and communicated to staff in ways that are clear and unambiguous: this may require additional training of staff and/or mechanisms to ensure understanding (such as tests or Certificates of Competency).4. Procedures, as with all elements of safety management, must be reviewed on a regular basis or when there has been a significant change to the system or operation in question. Furthermore, rules must be in place to ensure that only the most current version is available for use.5. FGSR inspect Fuel & Gas facilities to ensure that they are operated in a safe and controlled manner. Procedures are examined to ensure that they are:<ol style="list-style-type: none">a) Present: (That, where a need is identified, a procedure has been produced)b) Fit for purpose: (That the procedure accurately describes and controls the requirement)

c) Are being enacted: (That the instructions are being followed)

6. During a Fuel & Gas Safety Assurance Audit (FGSAA) an FGSR Inspector will require to see documentary evidence of the following:

- a) Safety Management Systems (Duty Holder's Policy, Organisation and Arrangements, Letters of Delegation etc.)
- b) Environmental Management Systems (EMSAS, Environmental Risk Assessments etc.)
- c) Risk Assessments (Site Hazard Survey, Activity Risk Assessments, COSHH, DSEAR etc.)
- d) Training Records (Certificates of Competence etc.)
- e) Maintenance Records (Dispensing Pump calibration, OWI maintenance etc.)
- f) Inspection Records (DIO Periodic Inspection (PG 06/12), Electrical Inspections)
- g) Emergency Plans (USRP, GEEP, Fire Plan)
- h) Site Specific Operating Instructions (SOPs, GSMP Section C).

7. Item h) above describes a range of procedures which are unique to the installation in question. These may initially be provided by designers/manufacturers, or devised by previous incumbents, but the key factor is that they are owned by the current installation operator, who is ultimately responsible for their upkeep, currency and promulgation. Examples include (*List not exhaustive*):

- a) Procedures for Bulk Fuels/Gas delivery. Gas cylinder delivery / issue (access, MHE, safety etc.)
- b) Gas Cylinder / Packed stocks storage/segregation etc.
- c) Procedures for site husbandry tasks. (key location)
- d) Procedures for BFCV / BFCV transfers (location, safety)
- e) Procedures for bulk LOx blowdown
- f) Procedures for fuels / gas quality checks, emergency checks (alarm checks, emergency showers, LEV etc.)

8. Procedures do not always have to be documents. Signage, traffic control measures and pedestrian restrictions are all examples of non-documentary procedures. Furthermore, this physical evidence provides proof that the procedures are being enforced. In addition to the documentary evidence listed above, FGSR inspectors will be looking for evidence of the procedures in practice (i.e. non-documentary evidence):

- a) Traffic/pedestrian Control
- b) Signage ("No Smoking", "UN product numbers" and "What to do in the Event of Fire" etc)
- c) Security (Locking of hatches, junction boxes etc)

- d) Operator's duties (direct questions on how operators perform their allotted tasks)
- e) Condition (evidence that the facility is being properly maintained)

9. A combination of documentary and physical evidence will allow FGSR inspectors to get a true picture of the organisational Safety Culture, and gain assurance that Safety Management Systems are in place.

10. In summary, the need for clear procedures is an essential part of safety management. Documentary evidence is the common way of demonstrating compliance, but other evidence such as the use of practical measures is also necessary to demonstrate that procedures are in place, fit for purpose and are actively enforced.

**Guidance
Material**

13. Guidance for suitable written instructions for the workplace are contained in the Provision and Use of Work Equipment Regulations 1998

14. JSP 317 Part 2 provides guidance on operating procedures for fuels activities.

15. JSP 319 Part 2 provides guidance on operating procedures for industrial gas activities.