

**MOD JSP 375 VOLUME 3**  
**CHAPTER 5**

**PETROLEUM INSTALLATIONS**

## Amendments

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Professional and Technical Support

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## Foreword

This Chapter of JSP 375, Volume 3 was prepared under the patronage of the Ministry of Defence (MOD) SSDC (Safety Sustainability Development & Continuity) and is to be read in conjunction with the Common Requirements contained in Chapter 2. These Safety Rules and Procedures are mandatory for adoption by the Commanding Officer, Chief Executive or Head of Establishment, into their site safety plans, to secure compliance with the Health & Safety at Work Act and to aid the safe conduct of works activities.

These Safety Rules and Procedures, in conjunction with the Common Requirements address the responsibilities of the MOD with regard to the design, construction, operation and maintenance of facilities under the ownership, in the widest sense, of the MOD.

The adoption of the document into the site safety plan will influence the conduct of many organisations and personnel, including those whose responsibilities are defined in the Common Requirements, as follows:

- Site Safety Officer
- Site Estates Team Leader
- Establishment Works Consultant (where this duty is still extant)
- Works Service Management organisation and other Maintenance Management Organisations, other Contractors and Sub-contractors
- Facilities Managers, Project Sponsors, Project Managers and Contractors for Projects
- Designers of facilities and installations

Technical advice and assistance on the application of this document can be obtained from:

Senior Authorising Authority  
Defence Infrastructure Organisation  
Kingston Road  
Sutton Coldfield  
B75 7RL

Amendments to this publication will be advised by a Defence Information Notice or a Defence Infrastructure Organisation (DIO) ES&P Policy Instruction issued to MOD Top Level Budget Holders, DIO and organisations managing the MOD Safe Systems of Work. It is the responsibility of persons using this publication on any MOD Establishment to check with the Facilities Manager or Project Sponsor to ascertain if amendments have been issued. JSP 375 Volume 3 has been devised for the use of MOD and its contractors in the execution of works in relation to the MOD estate. The Crown hereby excludes all liability (other than liability for death or personal injury) whatsoever and howsoever arising (including, and without limitation, negligence on the part of the Crown its servants or agents) for any loss or damage however caused where the Standard (JSP 375 Volume 3) is used for any other purpose. Compliance with either this Chapter or Chapter 2 (Common Requirements) does not of itself confer immunity from legal obligations. In the case of conflict between these Safety Rules and Procedures and a Statutory Requirement becoming evident, SSDC and the SAA Mechanical are to be informed. Contact addresses are given below.

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# **PART 1**

# **RULES AND PROCEDURES**

# 1. Introduction

## 1.1. General

- 1.1.1 These Safety Rules and Procedures provide instruction on how work on 'Petroleum Installations' is to be managed on sites and in work situations which are under the control of the Ministry of Defence (MOD). They are to be read in conjunction with MOD Safety Rules and Procedures JSP 375 Volume 3 and related Chapters.
- 1.1.2 For the purpose of these Safety Rules and Procedures, 'Petroleum Installations' incorporate those detailed in section 1.3 Scope and Limitations.
- 1.1.3 This document provides a system for:
  - a. controlling work on petroleum installations (as defined in section 1.3)
  - b. minimising the risks associated with working on petroleum installations
  - c. defining the roles and duties of key individuals to manage, oversee and perform any such work
  - d. use in the application of these Safety Rules and Procedures
- 1.1.4 Where necessary the Authorising Engineer is to obtain written agreement for deviation or local version from the Senior Authorising Authority.

## 1.2 Concept of Operations

- 1.2.1 These Safety Rules and Procedures mandate the establishment of key individuals with specific responsibilities for the management and / or execution of work on petroleum installations. Further guidance on the roles and duties of these appointments is given in JSP 375 Volume 3 Chapter 2 – Common Requirements.
- 1.2.2 The line manager of the Fuels and Lubricants section hereby known as the Operating Authority. The Operating Authority has delegated authority for the installations, in accordance with JSP 317. Authority must be given by the Operating Authority before any works can be undertaken on a petroleum installation.
- 1.2.3 The application of these rules is the responsibility of all those, operating, working on, testing, decommissioning, ordering, specifying and designing petroleum installations or associated equipment.
- 1.2.4 Further reference should also be made to JSP 317, The Storage and Handling of Fuels and Lubricants.

## 1.3 Scope and Limitations

- 1.3.1 These Safety Rules and Procedures are designed for use on MOD Establishments, both in the UK and overseas.
- 1.3.2 These Safety Rules and Procedures include and are not limited to the following permanent fixed installations:
  - a. Packed Stock Storage
  - b. Mechanical Transport Fuelling Installation
  - c. Aviation Fuelling and Distribution Installations
  - d. Marine Ship to Shore Fuelling
  - e. Petroleum Supply Depots
  - f. Class II Boiler and Generator Fuels

- g. Class III Boiler and Generator Fuels
- h. Waste Petroleum Product Storage

1.3.3 The petroleum installations listed above may include the following:

- a. storage tanks
- b. product receipt pipelines and filtration
- c. transfer pipelines including floating hoses and subsea pipelines
- d. dispense/receipt points to road vehicles
- e. rail facilities
- f. pump house/filter water separators and filter monitors
- g. roads, vehicle hard standing / interception and drainage oil separators
- h. valve pits
- i. hydrant distribution systems
- j. pipe line end manifolds

1.3.4 Ancillary installations (Class III & II) serving boilers and generator houses involving low risk activities are not within the scope of this Chapter. Boiler fuel oil installations low risk activities shall be managed under JSP 375, Volume 3 Chapter 4. All work shall be risk assessed and where deemed a high risk activity such as involving hot work or confined space entry, are within the scope of this Chapter.

1.3.5 Service family Accommodation boilers supplied by Class III fuels are outside the scope of this Chapter.

## **1.4 Definitions**

1.4.1 Within this Chapter the abbreviations Authorising Engineer and Authorised Person, refer to Authorising Engineer (Petroleum) and Authorised Person (Petroleum) and no other related specialism. Other related specialisms will be written out in full e.g. Authorised Person (Electrical).

1.4.2 Other relevant definitions are provided in JSP 375 Volume 3 Chapter 2 - Common Requirements.

## 2. Roles & Duties

### 2.1 General

2.1.1 This section discusses the principal roles and duties of those involved in the management of the Safe System of Work. These are identified as follows:

- a. The Co-ordinating Senior Authorising Authority (CSAA)
- b. The Senior Authorising Authority (SAA)
- c. The Co-ordinating Authorising Engineer (CAE)
- d. The Authorising Engineer (AE)
- e. The Safe System Co-ordinator (SSC)
- f. The Authorised Person (AP)
- g. The Person in Charge (PIC)
- h. The Skilled Person (SKP)
- i. Operating Authority (OA)

2.1.2 Unless otherwise defined in this Chapter the general roles and duties of all individuals listed in paragraph 2.1.1 above are covered in section 1.2 of JSP 375 Volume 3 Chapter 2 – Common Requirements. The purpose of this section is to summarise those roles and duties as well as to identify any specific and/or additional roles and duties connected with the management of work on petroleum installations.

### 2.2 Authorising Engineer

2.2.1 The role of the Authorising Engineer (AE) is to implement, administer, monitor and audit these Safety Rules and Procedures.

2.2.2 The scope of appointment for the AE will be dependent on competence and will be identified on the Certificate of Competence issued to the AE by the SAA.

2.2.3 To be eligible for appointment, prospective AEs are to meet the requirements defined by Section 3.1 of JSP 375 Volume 3 Chapter 2 – Common Requirements.

2.2.4 AE duties in addition to those detailed in Chapter 2 include:

- a. determining the level of authority given to an AP in respect of the hazard levels. These authorisations will be identified on the Certificate of Appointment issued to the AP
- b. implementing a site notification regime

### 2.3 Authorised Person

2.3.1 A key role of the Authorised Person (AP) is to oversee and certify works on petroleum installations for which they have been appointed.

2.3.2 Duties of the AP are detailed in JSP 375 Volume 3 Chapter 2 – Common Requirements section 1.2.7. In addition, duties of the AP include:

- a. reviewing all prospective work on petroleum installations at the point from which the AP has control of the risk and determining the appropriate level of control
- b. ensuring communication with the OA of the petroleum installation at the work planning stage
- c. preparing an AP Risk Assessment

- d. preparing a Safety Programme to ensure adequate control of a petroleum installation prior to the issue of any Permits to Work for that installation
- e. accepting of a petroleum installation from the OA for the purpose of planned works
- f. defining the condition of the petroleum installation that is required immediately before planned works can commence
- g. ensuring that a Task Risk Assessment and Method Statement for all work on a petroleum installation is prepared to the satisfaction of the AP
- h. ensuring that any recipient of any Safety Documents is a current SKP for the installation to be worked on
- i. handing over of a petroleum installation to the OA on completion of work
- j. assessing SKP for appointment
- k. maintaining a Register of SKP assessments

## **2.4 Person in Charge**

- 2.4.1 The role of the Person in Charge (PIC) is to directly supervise work on a petroleum installation for which they are in receipt of a Permit to Work or Standing Instruction.
- 2.4.2 The PIC must be an appointed SKP for the installation for which the Permit to Work or Standing Instruction is to be issued.
- 2.4.3 An AP may not act in the capacity of a PIC whilst working in the capacity as the AP for that installation or location.
- 2.4.4 Duties of PIC for work on Petroleum Installations include:
  - a. ensuring that adequate emergency arrangements are in place before commencing the works
  - b. ensuring that the contents of the Task Risk Assessment and Method Statement for the task are communicated to all members of the work team
  - c. ensuring that all necessary safety equipment is available and suitable for use prior to work
  - d. ensuring that all members of the work team are adequately trained, fit and able to carry out the work required
  - e. being fully conversant with and able to ensure compliance with the conditions set out in the Permit to Work or Standing Instruction and the agreed Safety Programme
  - f. ensuring that all members of the work team are aware of the method of work set out in the agreed Method Statement for the task, the means of communication, the emergency arrangements and the requirements of these Safety Rules and Procedures
  - g. ensuring that the only work carried out is that for which the Permit to Work or Standing Instruction is valid
  - h. stopping work and withdrawing all personnel, tools, plant and equipment if for any reason the conditions of the Permit to Work or Standing Instruction cannot be met
  - i. reporting to the AP any accident, dangerous occurrence, defects found or other exceptional incidents occurring whilst working under the Permit to Work or Standing Instruction
  - j. always be present at the work site when any work is being carried out
  - k. monitor and record gas levels in accordance with the requirement of Permit to Work

## **2.5 Work Team**

A Skilled Person (SKP) will form part of the work team; for the duties of the SKP refer to Chapter 2 Common Requirements.

### **2.5.1 Duties of the work team include:**

- a. working in accordance with these Safety Rules and Procedures
- b. taking reasonable care of the health and safety of themselves and of any other person who may be affected by their actions or omissions
- c. only using equipment for which they have been trained and in the manner in which they have been trained
- d. reporting to the PIC/AP any defects found in the tools, plant and equipment to be used in the works
- e. reporting to the PIC/AP any defects identified with the equipment being worked on
- f. being conversant with petroleum hazards
- g. understanding the management hierarchy relating to the site installations

## **2.6 Operating Authority**

The line manager of the Fuels and Lubricants section, hereby known as the Operating Authority (OA) throughout this document, has the authority delegated by the Commanding Officer, Head of Establishment or Officer in Charge for one or a number of petroleum installations. The OA is required to exercise duty of care over all activities at the installations and ensure that petroleum and base wide operations are fully taken into account before the AP is given authority to undertake work.

## **3. General Arrangements**

### **3.1 General**

- 3.1.1 Compliance with these Safety Rules and Procedures is mandatory for work on petroleum installations, under the control of the Ministry of Defence (except where agreed with the SAA) from initial specification and design through installation operation and eventual de-commissioning. The design must incorporate adequate means for safe isolation and draining of the equipment. Consideration must be given to the needs of the operator and maintainer of the plant to enable safe working. Changes made to the original design, as a result of site alterations must not compromise safe working and preserve the ability for safe isolation. The Project Manager in charge of the works is to ensure that any alterations made on site do not affect the application of these Safety, Rules and Procedures.
- 3.1.2 The AE and APs for the establishment are to be available to provide advice on the application of these rules to any new installations and modifications to existing ones and to review tender drawings for compatibility with the requirements of these Safety Rules and Procedures.
- 3.1.3 Those involved in commissioning new works with respect to petroleum installations must be fully conversant with the requirements of the Safety Rules and Procedures and take these into consideration when commissioning the installation. The AE and/or APs for the establishment are to be included in both snagging and handover meetings for new works to advise on and ensure compliance with these rules.
- 3.1.4 As part of the handover procedures, the installer must include an adequate period of training for the OA, AP and SKP who will be responsible for the operation and maintenance of the installation.

### **3.2 Site Review**

- 3.2.1 A record of petroleum installations on an establishment that are subject to the application of these Safety Rules and Procedures is to be provided and held in the Petroleum Installation Document Register (PIDR). The professional inspection of fuel installations and flammable dangerous goods stores reports and the hazardous areas list from the establishment shall be utilised as a basis for maintaining this record. An appraisal is to be undertaken by any new AE, SSC or APs as part of their familiarisation. A review of this record is to be undertaken following any changes or modifications to the petroleum installation. The review is to be recorded in the Petroleum Installations Operating Record (PIOR).
- 3.2.2 The review is to consider the classification and hazards for each installation. This should be undertaken in conjunction with the decision tree detailed in section 5.4. Should the AE consider that a higher level of control is required on a particular installation, this should be detailed within the PIOR, documented in the PIDR and communicated to the APs. The following areas should be considered:
- a. product
  - b. flammability
  - c. toxicity
  - d. location
  - e. size
  - f. quantity of product held
  - g. complexity
  - h. potential environmental impact
  - i. maintenance regime
  - j. operational duties

- k. age
- l. condition
- m. records, drawings and instructions
- n. outstanding remedial works

3.2.3 The AE may determine that other fuel related systems pose hazards that require control by the implementation of these Safety Rules and Procedures (e.g. aviation fuel systems test houses, engine test houses and unclassified fuels). Details of these additional systems are to be recorded and filed in the PIDR and included on the APs appointment.

### **3.3 Demarcation Agreements**

3.3.1 Where a third party has responsibility for a petroleum installation, defined equipment or services a demarcation agreement must be drawn up setting out the exact point(s) of demarcation, and detailing the responsibilities of all parties to the agreement. See Annex K for Works Organisation at Product Receipt Enclosure

3.3.2 A drawing marked with the demarcation points must accompany the agreement. As a general rule, demarcation points are to be immediately upstream or downstream of valves to aid isolation and provide an easily identified demarcation point.

3.3.3 The demarcation agreements are to be agreed and accepted by the AE. Copies of the agreements are to be filed in the PIDR

3.3.4 Where works cross the boundaries of demarcation agreements it may be necessary to obtain a Permit to Work or Certificate of Isolation from a third party. A Certificate of Isolation is a formal statement to be completed by the responsible person for one side of a demarcation line between two sections of a petroleum system/installation. This will enable work to be undertaken for which there is shared responsibility, as defined by the demarcation agreement.

## 4. Management Arrangements

### 4.1 Petroleum Installations Document Cabinet

- 4.1.1 For each site, location or geographical area(s), a document cabinet is required for the documents that support the management arrangements for petroleum installations and will include the following:
- a. working pads, completed pads and stocks of:
    - i. Safety Programmes
    - ii. Permits to Work
    - iii. Standing Instructions
  - b. Petroleum Installations Operating Records
  - c. the Petroleum Installations Document Register (PIDR)
  - d. folders used for holding other relevant documents
- 4.1.2 The document cabinet is to be a lockable drawer, cabinet or series of cabinets which is to be kept locked when unattended. Access is to be under the control of the APs.
- 4.1.3 The document cabinet, and the documents/information contained therein are, and remain, the property of the MOD. This is to remain available on any change of AP, AE or Maintenance Management Organisation (MMO).
- 4.1.4 Where documents noted above are held elsewhere, their location is to be identified in the relevant section of the Document Register.

### 4.2 Petroleum Installations Document Register

- 4.2.1 The Petroleum Installations Document Register (PIDR) is the principal source of management information for petroleum installations within the site, location or geographical area and is to be maintained by the APs.
- 4.2.2 The PIDR will contain the following information:
- a. an index
  - b. a detailed record of petroleum installations/systems subjected to the application of these Safety Rules and Procedures
  - c. details of all redundant or abandoned tanks on site
  - d. demarcation agreements
  - e. planned maintenance regime
  - f. a schedule of Personal Protective Equipment (PPE), Respiratory Protective Equipment (RPE) and Safety Equipment held and maintained relating to the Petroleum discipline
  - g. OA notification regime
  - h. Safety Data Sheets (product or material SDS)

Records completed by the AP for:

- a. the examination/calibration of PPE, RPE and other Safety Equipment
- b. the number of hours in use of all PPE, RPE for all MMO site held equipment
- c. duplicate Permits to Work (can be held in pad)
- d. completed Safety Programmes and Risk Assessments
- e. Standing Instructions (can be held in pad)
- f. cancelled Permits to Work
- g. cancelled Standing Instructions
- h. a register of all staff that have been medically cleared for work on petroleum installations
  - i. this is to include the level of the medical clearance.
- i. copies of Professional Inspection reports

- j. any previous reports which may assist in assessing whether the petroleum system is safe to operate
- k. relevant information on repairs
- l. petroleum system schematics, hazardous zone drawings and valve identification charts where determined necessary by the AE
- m. any relevant Policy Instruction, Defence Instruction Notice (DIN), Operational Restriction, Safety Alert, AE Instruction, as directed by the AE
- n. Unit Spillage Response Plan
- o. AE/AP appointment information
- p. skilled person appointment information
- q. AE audit reports

4.2.3 Where documents noted above are held elsewhere, their location is to be identified in the relevant section of the Document Register.

### **4.3 Petroleum Installations Operating Record**

4.3.1 For each site, location or geographical area, as determined by the AE, a Petroleum Installation Operating Record (PIOR) is to be prepared. This is to be in the form of a bound book, with pages sequentially numbered. The book is to be clearly and indelibly marked with the name of the site/location or geographical area to which the records relate.

4.3.2 The AE may determine that it be preferable to have separate PIOR for distinctly separate installations.

4.3.3 Entries are to be made within the PIOR of any activity undertaken with respect to a Petroleum installation (as defined by these Safety Rules and Procedures). These entries are to include:

- a. the relinquishing and acceptance of responsibility between APs
- b. the isolation of any Petroleum Installation (or part of a system) in accordance with a Safety Programme and Risk Assessment
  - i. this is to make reference to the Safety Programme and Risk Assessment and not repeat all steps from the Safety Programme
- c. when Multiple Gas Indicators are response tested, to include the make and serial number of the instrument, and a satisfactory or non-satisfactory result
- d. the issue and cancellation of each Permit to Work or Standing Instruction
- e. the loss of a Permit to Work or Standing Instruction
- f. the withdrawal of a Permit to Work or Standing Instruction including the reason for withdrawal
- g. the re-instatement of any Petroleum Installation (or part of a system) following the completion of all works and the closure of the Permit to Work or Standing Instruction
- h. details of any reportable disease, injury or dangerous occurrence and spill reports associated with work on Petroleum Installations
- i. any change of the product in a petroleum storage system
- j. AE visit, audit or inspection
- k. SAA visit, assurance audit or inspection
- l. The undertaking of a Professional Inspection of Fuel Facilities and Flammable Dangerous Goods Stores
- m. receipt of relevant Policy Instruction, Defence Instruction Notice (DIN), Operational Restriction, Safety Alert, AE Instruction and resulting action taken in response to the receipt

4.3.4 Entries in the PIOR are to be made in chronological order, each entry being ruled off with a horizontal line across the page. A sample format for the PIOR is given in Part 2 Model Forms.

- 4.3.5 Completed PIORs are to be retained in the Petroleum Installations Document Cabinet for a minimum period of three years after the date of the last entry.

#### **4.4 Keys & Key Security**

- 4.4.1 The use of safety key boxes, safety and other types of locks in the management of these Safety Rules and Procedures are detailed in JSP 375 Volume 3 Chapter 2.

#### **4.5 Management of Remote Sites**

- 4.5.1 Where sites do not have a resident AP, the AE is to determine suitable arrangements for the management of any work on petroleum installations at that site. This will include the appointment of an AP for the remote site. The AE is to determine the arrangements for custody of the documents relating to the remote site.

#### **4.6 Notification Regime**

- 4.6.1 A formal notification regime is to be implemented between the OA and the APs. For each site the AE is to approve the notification regime to ensure control and co-ordination is achieved on current and planned works requiring the application of these Safety Rules and Procedures. The regime is to be formally agreed by the MMO and OA. Details of the regime are to be held in the PIDR.

#### **4.7 Co-ordination and Co-operation of Activities**

- 4.7.1 Tasks to be carried out on petroleum installations by organisations other than the MMO must be coordinated with the OA. The information obtained can be used by the OA to link to the system in place for the establishment wide control and co-ordination of operations and works activities. In this way establishment wide safety issues can be taken into account, together with local operational matters at the petroleum installation.
- 4.7.2 Where work involves APs from different disciplines, the AP Petroleum is to co-ordinate the activities of the APs of all other disciplines.
- 4.7.3 In exceptional circumstances, and only where approved by the AE, where it is beyond the capacity of the AP to raise the required safety documents and provided there is no conflict between the activities then a second AP can take responsibility for additional work on the same site. The following co-ordination arrangements are to apply as a minimum:
- the duty AP is to identify the extent of the work the second AP is able to cover
  - the second AP is to be familiar with the extent of the works already being managed by the duty AP
  - the second AP is to sign on in the PIOR making a clear note that there are now two APs on duty and clearly state the extent of the work for which he is taking responsibility
  - once the overlapping is completed, the appropriate AP is to sign off in the PIOR, making a clear note of the name of the remaining AP and informing that AP accordingly.

#### **4.8 Safety Rule Book**

- 4.8.1 The Petroleum Safety Rule Book has been prepared for the benefit of all persons involved in working on petroleum installations for which the Ministry of Defence is responsible.
- 4.8.2 All persons issued with the Petroleum Safety Rule Book are to have it available for reference whenever they are working on petroleum installations.
- 4.8.3 The AP is to ensure that all appointed SKPs are in possession of a Petroleum Safety Rule Book.

## **5. Operational Procedures**

### **5.1 General**

5.1.1 This Section describes the documents to be used and the operational procedures to be adopted when controlling work on any petroleum installation defined in these Safety Rules and Procedures.

### **5.2 Risk Assessment**

5.2.1 Risk Assessments are carried out to identify the risks to health and safety to any person arising out of, or in connection with, work or the conduct of their undertaking. They should identify how the risks arise and how they impact on those affected. This information is needed to make decisions on how to manage those risks so that decisions are made in an informed, rational and structured manner and that the action taken is proportionate.

5.2.2 For the purposes of these Safety Rules and Procedures there are two distinct types of risk assessment; an AP Risk Assessment and a Task Risk Assessment.

5.2.3 The AP Risk Assessment is required to be produced by the AP to address the hazards exhibited by the installation/system in relation to the task. It is to include information concerning the methodology for isolation and/or control of the task, which will then be detailed within the Safety Programme.

5.2.4 The Task Risk Assessment is required to cover the risks encountered in carrying out the task. The Task Risk Assessment is to be completed by the person/persons carrying out the task and is to include local hazard information supplied to the individual by the Area Custodian as detailed by JSP 375 Volume 2 Leaflet 34.

5.2.5 The Task Risk Assessment is to be submitted to the AP prior to raising a Safety Programme or Standing Instruction. This must be a reasonable timeframe (to be agreed with the AP/SKP) prior to the requirement for a Permit to Work or Standing Instruction to be issued. This will enable the AP to allow sufficient time for the review of the Task Risk Assessment.

5.2.6 The AP is to review the Task Risk Assessment and determine if it is consistent with the method of control. Should the AP consider the Task Risk Assessment inadequate, a Permit to Work or Standing Instruction is not to be issued. If the AP is in doubt as to the suitability of the Task Risk Assessment they are to refer to the AE for further guidance.

5.2.7 During the task the AP Risk Assessment is to be retained with the Safety Programme, and the Task Risk Assessment with the associated Permit to Work or Standing Instruction.

5.2.8 Contents of all Risk Assessments must be communicated to all parties involved in the task.

5.2.9 A model form to record the findings of the AP Risk Assessment is given in Part 2. This does not restrict the use of other model forms that are used to record risk assessments for the purpose of complying with the Management of Health and Safety at Work Regulations.

### **5.3 Method Statement**

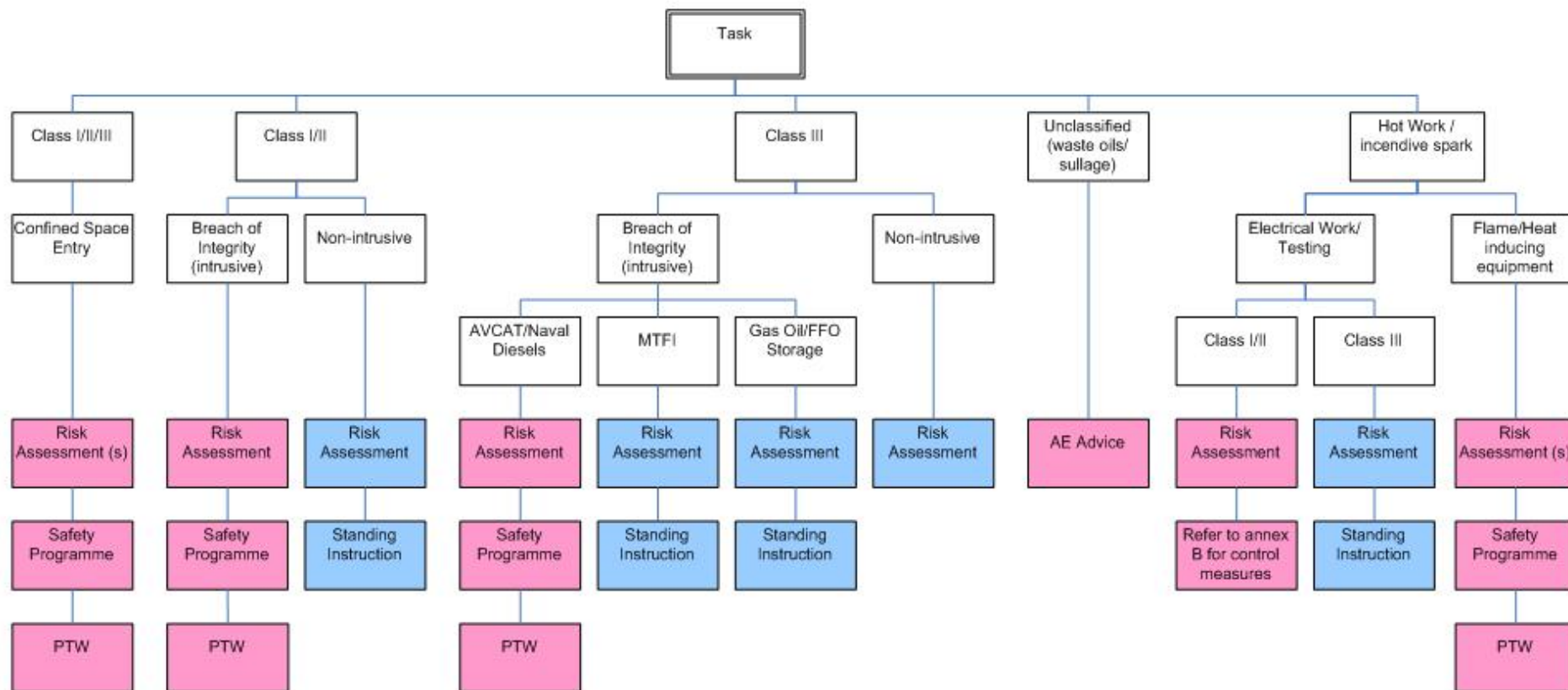
5.3.1 The Method Statement is a written procedure to be produced by those undertaking the work that specifies the works to be done. A Method Statement for the task is to be completed and submitted to the AP at the start of the planning process to enable an AP Risk Assessment to be developed. All activities that necessitate the issue of a Permit to Work or Standing Instruction are to be supported with an appropriate Method Statement which is to include the following as a minimum:

- a. a description of the task and location
- b. the sequence and method of work
- c. the hazards identified during the risk assessment
- d. the skills required to deal with the hazards
- e. the precautions necessary to control the hazards
- f. references to specific safety procedures covering known hazards
- g. details of tools and equipment to be used
- h. method of disposal of waste and debris
- i. details of the state or condition in which the plant or equipment will be left at the end of the activity

## **5.4 Determining the Level of Control**

### **5.4.1 Decision Tree**

The decision tree provides guidance on the level of control to be applied for common elements of tasks likely to be found on petroleum installations on the MOD estate. The AE should be consulted for advice where tasks fall outside of this guidance.



Definitions:  
 Breach of integrity involves the exposure of product.  
 Non-intrusive works are those where no breach of integrity takes place for example Inspections, painting etc

Note: see Annex E for specific guidance on requirements for Grass cutting



- 5.4.2 The level of control exercised over work on petroleum installations will take the form of one of the following:
- a. Standing Instruction
  - b. Permit to Work
- 5.4.3 If work is planned simultaneously at multiple petroleum installations, a separate Permit to Work (Permit to Work) must be raised for work at each installation. When an area is restricted by the implementation of a Permit to Work, only one Permit to Work may be in use at any one time in that particular restricted area.
- 5.4.4 Normal practice should be to limit the number of Permit to Work issued for a hazardous area to one at any point in time. There may be occasions where multiple work activities in one hazardous area cannot be avoided requiring more than one Permit to Work, on such occasions the agreement of the AE to proceed must be sought. Work activities, their co-ordination and control shall be identified in the planning process, the AP Risk Assessment and detailed clearly within the PIOR.
- 5.4.5 Where certain facilities e.g. standby generator houses are located within the security fence surrounding fuel installations, but not within the hazardous area zones as classified by the Dangerous Substances and Explosive Areas Regulations (DSEAR), where the AP determines necessary it is admissible for a Standing Instruction (SI) to be raised for such works, simultaneously with a Permit to Work for works on the petroleum installation. Such occasions are to be identified within the planning process, the AP Risk Assessment and detailed clearly within the PIOR.
- 5.4.6 Guidance on the requirements of the Standing Instruction and Permit to Work is given in sections 5.7 and 5.9.

## **5.5 Restricted Area**

- 5.5.1 This is an area in which there is an increased risk of fire, explosion, asphyxiation or poisoning, due to spillage, defects or the nature of the work to be undertaken. Before a restricted area can be set up all operations must cease and personnel withdrawn. A restricted area is to be set up when petroleum products are exposed in liquid or vapour form, when there is a requirement to enter confined spaces, or there is a need for hot work to be undertaken. Further guidance is detailed in Annex F.

## **5.6 Safety Programme**

- 5.6.1 A Safety Programme (SP) is to be implemented before the issue of any Permit to Work.
- 5.6.2 The SP cannot be closed until all Permits to Work raised against it are complete and the system/installation has been visually inspected for integrity by the AP.
- 5.6.3 A SP is to have a format similar to the model form detailed in Part 2 of these Safety Rules and Procedures. Each sheet of the SP is to bear the same pre-printed serial number on the original and duplicate copies.
- 5.6.4 The SP is to include the necessary steps for control of the complete task. This is to include the issue of Permit to Work and general steps to completion of the work and reinstatement.
- 5.6.5 The SP is to include:
- a. the location of the installation
  - b. AP Risk Assessment number
  - c. the type of installation, which the proposed work sequence will make safe to work on

- d. cross-reference to other relevant certificates and permits
- e. OA authorisation and contact details
- f. the maximum gas concentrations applicable to the type of work to be undertaken
- g. permissible oxygen level minimum of 19% and a maximum of 22% at the point of work
- h. grades of RPE and PPE and other safety equipment to be used
- i. the point(s) of work, which is/are to be made safe
- j. arrangements to isolate product and/or electricity supplies
- k. the name and signature of the originating AP (and where applicable the countersigning body)
- l. a schematic diagram with the points of the isolation, draining arrangements, points of work, other safety measures and equipment
- m. the works sequence to be undertaken indicating:
  - i. the location at which each operation is to be performed
  - ii. the identity of each valve or component part to be operated
  - iii. the operation to be performed
  - iv. the reason for the operation
  - v. the maximum allowable gas concentration
  - vi. any item (e.g. keys, locks, signs) required
  - vii. steps required for reinstatement

- 5.6.6 The diagram required as part of the SP may either be a hand drawn or a CAD drawing (or section of one) or a copy of the relevant schematic stapled to the SP. Such drawings are to incorporate a title block, which includes the SP number, the name and signature of the AP, the name and signature of the PIC and is to be dated upon issue of the SP.
- 5.6.7 When the SP has been produced, including the work sequence, and is ready to be implemented, the AP is to obtain OA authorisation for the work to proceed by having them sign the SP at part 2. The AP is then to issue the OA a copy of the SP for their reference.
- 5.6.8 The requirement for a second confirming signature (counter-signature) endorsing the safety programme, already signed by the originating AP, remains within the judgment of the AE and is not a mandatory prerequisite of these Safety Rules and Procedures.
- 5.6.9 Each isolation point is to be secured with a Safety Lock (where practical) and a safety sign fitted.
- 5.6.10 Upon completion of any initial isolation in the work sequence, the AP is to place any Safety Keys used into a Safety Key Box.
- 5.6.11 When a SP has been implemented the AP is to file the original in the Petroleum Installations Document Cabinet. This gives a record of the isolation as implemented.
- 5.6.12 Once isolations have been made or removed the actions are to be recorded in the PIOR by reference to the item number of the sequence of operation entry contained within the SP.
- 5.6.13 When all work associated with a SP has been completed and all associated Permits to Work have been completed or stopped, the AP is to visually inspect the system for integrity and cancel the original SP at part 4. The installation is to then be returned to the OA who confirms return at part 5. The original is then to be filed in the PIDR for a period of not less than three years.

## **5.7 Permit to Work**

- 5.7.1 A Permit to Work (PTW) is required as determined by the decision tree in section 5.4.1 and AP Risk Assessment.

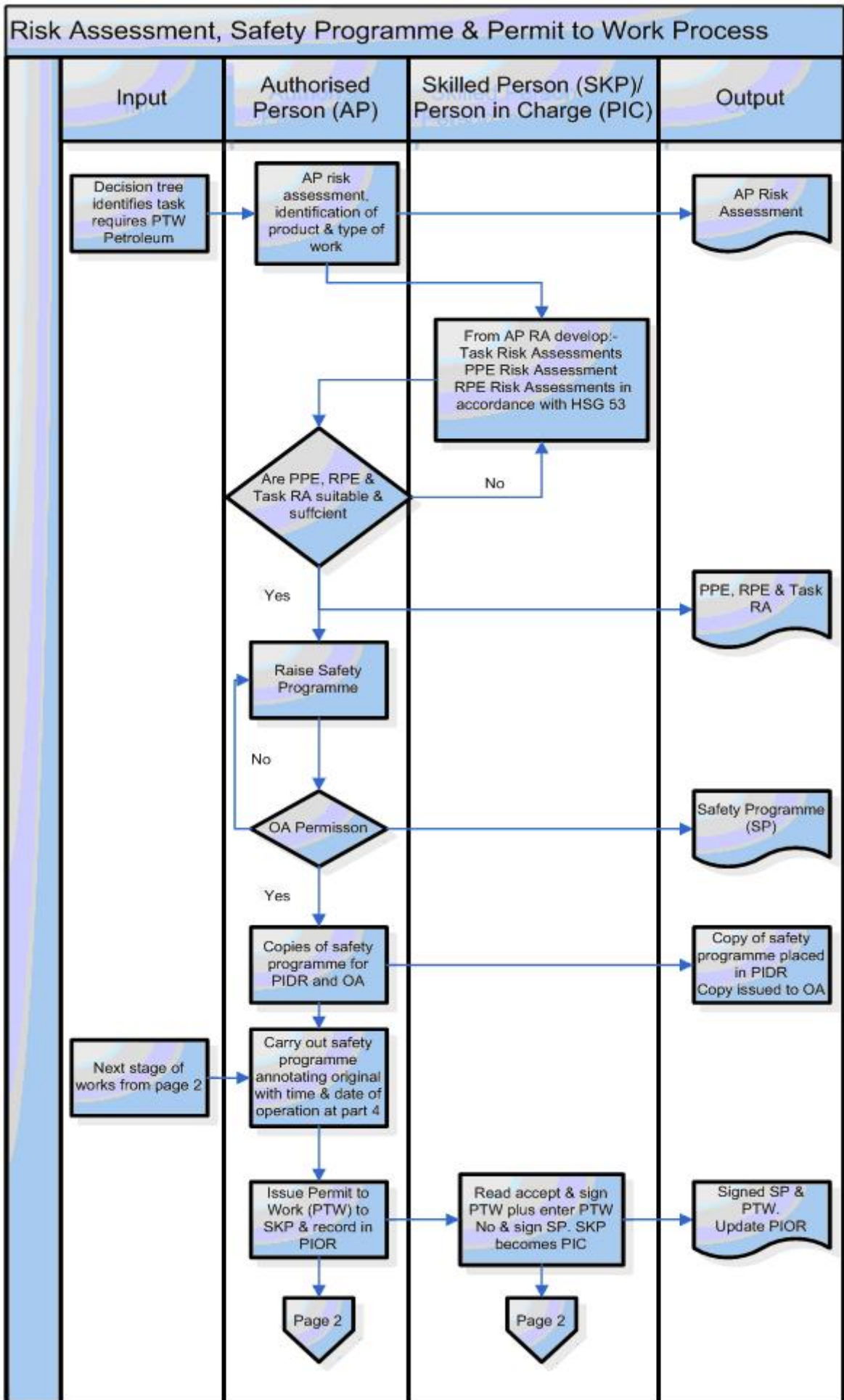
- 5.7.2 A PTW is to have a format similar to the model form detailed in Part 2 of these Safety Rules and Procedures. Each sheet of a permit is to be identified by the same pre-printed serial number on the original and copy. Sets of consecutively numbered forms are to be used.
- 5.7.3 Before the issue of the PTW the AP and prospective PIC are to carry out joint gas monitoring with two gas detectors, the highest reading of the two being recorded on the PTW.
- 5.7.4 The AP is to issue the PTW immediately before work is to commence and it is to remain in force until the work is completed or the PTW has been reaffirmed a maximum of seven times.
- 5.7.5 Where works is to continue over a number of days and the PTW will require reaffirming the PTW is to be suspended at the end of each working day. The AP and PIC are to confirm that the work has been suspended, carry out gas monitoring and record in part 5 to confirm a safe condition prior to leaving site.
- 5.7.6 Whilst a PTW is in force a sign is to be displayed at the point of work clearly identifying that a PTW is in force and giving contact details of the AP and the Safety Programme number (this may form part of the Temporary Restricted Area Signage).
- 5.7.7 APs cannot issue permits to themselves.
- 5.7.8 A PTW is to state precisely and legibly:
  - a. the installation to be worked on
  - b. the location of the installation
  - c. the proposed work
  - d. the serial number of the Safety Programme
  - e. where applicable, the serial number of any related safety documentation (i.e. Electrical PTW)
  - f. validity period

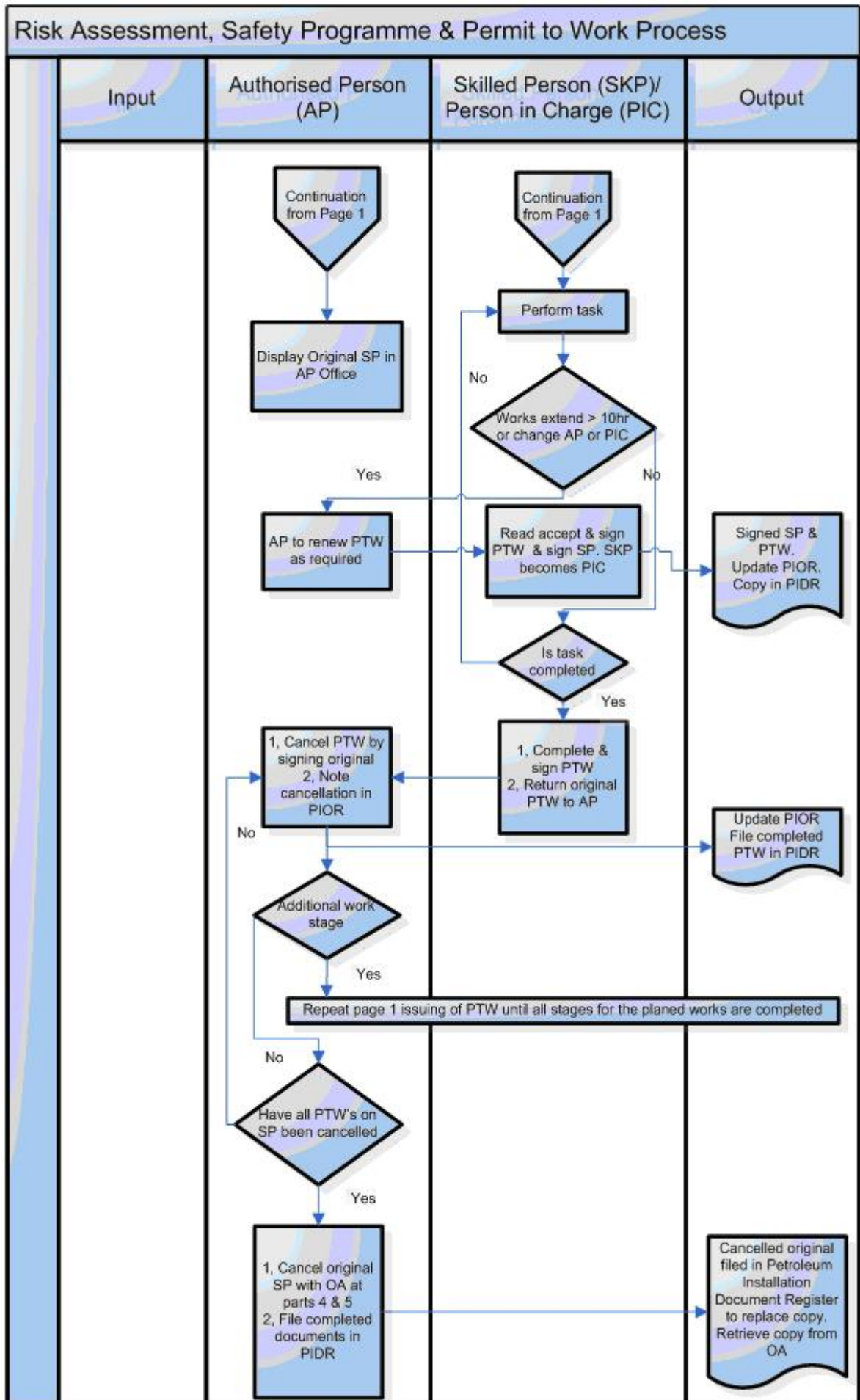
## **5.8 Issue, Acceptance and Cancellation of Permits to Work**

- 5.8.1 A PTW to be issued only at the point of work. The issue and cancellation of every PTW is to be recorded in the PIOR.
- 5.8.2 The AP is to issue the PTW only to SKP on the AP's Register of SKPs
- 5.8.3 Before the issue of a PTW the AP is to demonstrate to the SKP:
  - a. the identity of the petroleum installation and the component parts to be worked on
  - b. any initial isolations in accordance with the SP
  - c. the safety arrangements at the place of work and at points of isolation
  - d. any special instructions and/or safety measures
  - e. where applicable, that the point(s) of work is drained, and that it is safe for the work to proceed
- 5.8.4 Before the issue of a PTW the AP is also to ensure that the SKP is in possession of and understands the Task Risk Assessment and the Method Statement for the task.
- 5.8.5 Before accepting the PTW the prospective PIC is to:
  - a. read the PTW and the Safety Programme and sign the drawing(s)
  - b. agree the extent of the work
  - c. agree the safety precautions

- d. be prepared to supervise or undertake the work
- 5.8.6 The SKP is to sign the relevant Section of the PTW to accept the responsibilities of the PIC. On signing for acceptance of the PTW the SKP authenticates the permit as valid and becomes the PIC of the permitted work. The PIC is then to take control of the PIC Key from the Safety Key Box.
- 5.8.7 The acceptance of a PTW identifies the PIC as personally responsible for supervising or undertaking the defined work.
- 5.8.8 While the work is in progress, the PIC is not permitted to leave the site or to undertake any other work or tests. If for any reason the PIC has to leave the point of work then during that temporary absence work is to be halted. The PIC is to ensure that suitable safety precautions are taken and the AP informed, before leaving the point of work.
- 5.8.9 Where a change of AP and/or PIC is required, the incoming AP/PIC are to carry out the joint checks and are to sign part 5 of the PTW to accept control of the work and any restrictions and controls laid down in the safety paperwork. The change is to be recorded in the PIOR.
- 5.8.10 On completion of the work the PIC is to:
- a. withdraw all persons, equipment, tools and instruments from the point of work
  - b. advise all persons under their control that they are no longer permitted to work on the petroleum installation
  - c. complete and sign the relevant section of the original PTW
  - d. return the original PTW and PIC Key to the Safety Key Box to the AP
- 5.8.11 The AP is to confirm that the work has been completed satisfactorily and carry out final gas monitoring and record in part 3 of the PTW, to confirm safe condition prior to handing back the installation to the OA.
- 5.8.12 The AP is to cancel the PTW by signing part 8 of the original and filing in the PIDR and recording the cancellation in the PIOR.
- 5.8.13 If the AP decides that it is necessary to stop the work, the PTW is to be withdrawn and cancelled. The withdrawal is to be noted on part 7 and 8 of the copy of the PTW and the reasons for withdrawal recorded in part 6 and any actions taken are to be noted in the PIOR. A new PTW is required before re-starting work.
- 5.8.14 The PTW is to be cancelled or suspended if during the period of validity, any of the following conditions apply:
- a. the conditions under which it was issued change beyond the stipulated limits e.g. gas concentration and oxygen percentages
  - b. a change of work is necessary which is not authorised on the original PTW
  - c. any personnel or contractors disregard the conditions of the PTW/or the MOD Safety Rules and Procedures
  - d. there is a failure of safety equipment
  - e. prolonged absences of the AP or PIC
  - f. the OA requests the discontinuation of the work
  - g. should any accident occur involving injury to personnel, damage to equipment or plant, or spillage of product
- 5.8.15 Where the work is stopped and the PIC has returned the PTW, the AP is to annotate the Safety Programme to highlight that work may not be complete. This serves to prevent removal of the isolations until all associated work is complete and the integrity of the system has been restored.

- 5.8.16 If the PIC has lost the original PTW, the loss is to be recorded by the AP in the PIOR. The copy of the PTW is then to be used in place of the original and cancelled in accordance with the above paragraphs. The PIC is to countersign the statements in the PIOR to confirm and acknowledge the loss of the PTW.
- 5.8.17 Copies of cancelled original PTW, together with their associated Risk Assessments and Safety Programme are to be retained in the PIDR for a minimum period of three years after the cancellation date.





## 5.9 Standing Instruction

- 5.9.1 A Standing Instruction (SI) can be issued by the AP to a SKP for both one-off and repetitive tasks on petroleum Installations where the risk assessment has determined that the task is low risk and a Permit to Work is not appropriate.
- 5.9.2 Examples of tasks for which an AP may issue a SI:
- external inspection and non intrusive work on Class I and II installations, not involving Hot Work or requiring entry into Confined Spaces
  - intrusive work on Class III installations excluding tank entry
  - electrical Work and Testing on Class III installations
- 5.9.3 Non intrusive work on Class I and II installations may be defined as low risk maintenance tasks, not including any task which exposes petroleum products in liquid, gas or vapour form, introduction of a source of ignition, or involves confined space entry. Examples of these non intrusive tasks are:
- external painting
  - tightening pipeline flanges and unions, rectification of minor leaks
  - adjusting machinery, equipment and metering
  - adjustment and tightening of valve glands (excluding repacking)
  - maintenance tasks of valve gear equipment
  - minor adjustment or replacement of instruments and equipment
- 5.9.4 Intrusive works on Class III installations with the exception of AVCAT and Naval Fuel Depots containing large storage may be defined as low risk maintenance tasks. Electrical work and testing on all Class III installations may be defined as a low risk task.
- 5.9.5 An SI is to contain the following information:
- validity period of SI
  - location and Identity of equipment
  - task or operation to be undertaken
  - detail of tasks to be carried out
  - special instructions or safety measures applicable
  - originating AP
  - name of SKP
  - employer
- 5.9.6 SIs must be specific to a system and must contain sufficient detail with respect to the procedure required to be undertaken by the SKP to ensure that the facilities and installations

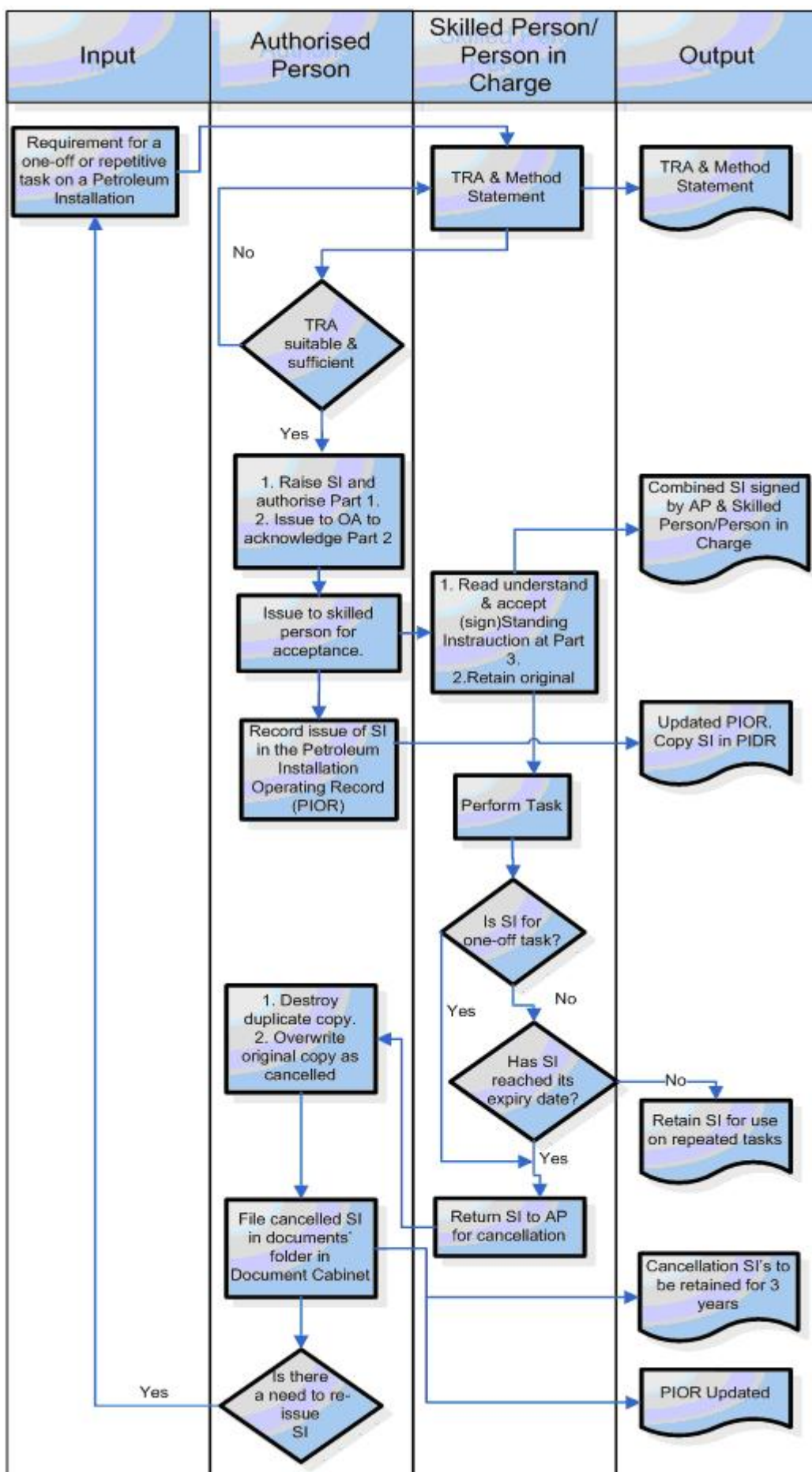
are safe before commencement of work. The Process Chart details the procedure for issuing a SI, and is found at the end of this section.

- 5.9.7 All risks and hazards associated with the work to be carried out under a SI and the controls identified to manage them must be fully communicated to the PIC prior to commencement and issuing of a SI. All work on petroleum installations will be co-ordinated by the AP to ensure that the petroleum related risks are fully taken into account. For all petroleum tasks undertaken by a SI, a Task Risk Assessment and Method Statement will be produced by the PIC and reviewed by the AP.
- 5.9.8 SIs Electrical issued by the AP Electrical for electrical work are outside the scope of these Safety Rules and Procedures and are covered in JSP 375 Volume 3 Chapter 3.
- 5.9.9 A SI is to have a format similar to the model form SRP PET 05 of these Safety Rules and Procedures. Each sheet of a SI is to be identified by the same unique serial number on the original and duplicate copies.

## **5.10 Issue, Acceptance and Cancellation of Standing Instructions**

- 5.10.1 Having determined the level of control from the Decision Tree, the AP may raise a Standing Instruction for the defined or repetitive task(s). The AP must detail:
  - a. the task or operation to be conducted on the equipment
  - b. specified circumstances under which the task may be conducted
  - c. any special instructions or safety measures
- 5.10.2 The AP authorises the Standing Instruction by signing Part 1 of the document.
- 5.10.3 The AP then informs the OA of the proposed issue of the Standing Instruction detailing the task to be undertaken, advising of the effect that the task may have on operations. The OA will acknowledge the issue of the Standing Instruction by signing Part 2.
- 5.10.4 Having acknowledged the instruction(s) and being prepared to undertake the task(s), the SKP is to sign and accept the Standing Instruction by signing Part 3. On signing for acceptance of the instruction a SKP authenticates the instruction and becomes the PIC of the permitted task(s). Notwithstanding that the PIC has been authorised to undertake the task, he must seek the permission of the OA before conducting the task on each occasion.
- 5.10.5 The issue of a Standing Instruction is to be recorded in the PIOR. The original copy of the Standing Instruction is to be issued to the SKP who then becomes the PIC. A duplicate copy is to be retained in the PIDR.
- 5.10.6 When an AP is appointed or returns to duty the AP is to review the PIOR to check for any Standing Instruction in force. The APs are to familiarise themselves with the contents of the extant Standing Instructions and annotate the PIOR to record this fact.
- 5.10.7 On completion of the tasks outlined in the Standing Instruction or on reaching the expiry date, the PIC is to return the instruction to the AP for cancellation. All Standing Instructions are to include an expiry date.
- 5.10.8 The AP may cancel a Standing Instruction at any time by retrieving the original from the PIC and destroying the duplicate. The original Standing Instruction is to be overwritten with the word "Cancelled" or "Expired", as appropriate, followed by the date of termination. The original copy of the Standing Instruction is to be retained in the PIDR for a period of three years from the date of termination. The cancellation is to be notified to all other APs appointed for the installation and facilities.

- 5.10.9 The cancellation of a Standing Instruction is to be noted in the PIOR.
- 5.10.10 If the PIC has lost the original Standing Instruction, the loss is to be recorded by the AP in the PIOR. The copy of the Standing Instruction is then to be used in place of the original and cancelled in accordance with the above paragraphs. The PIC is to countersign the statements in the PIOR to confirm and acknowledge the loss of the Standing Instruction.
- 5.10.11 A Standing Instruction is not to be transferred from one PIC to another.
- 5.10.12 A Standing Instruction is to be valid for not more than three years and must be reviewed by an AP at intervals of not more than twelve months or following any change or modification to the system; the review of the Standing Instruction is to be recorded in the PIOR. The review shall be carried out in conjunction with the review of the SKP status.



## **6. Training**

### **6.1 Introduction**

6.1.1 The requirements for general training for APs and AEs are given in JSP 375 Volume 3 Chapter 2 and are not discussed further within this section.

### **6.2 Authorising Engineers**

6.2.1 AEs for the petroleum discipline must achieve the same technical training standards as given in Section 6.3 for an AP.

6.2.2 The AE for a site is to be involved in the selection and training requirements of APs intended for appointment on that site.

### **6.3 Authorised Persons**

6.3.1 The AP is required to satisfactorily complete the necessary training prior to appointment. This training is made up of :

- a. initial common requirements training to all AP appointments
- b. the Authorised Person Petroleum Course
- c. any additional specialist training identified by the AE

### **6.4 Petroleum Course**

6.4.1 The Petroleum Course is designed to inform APs how to implement the Petroleum Safety Rules and Procedures and to provide an understanding of the management of risks.

6.4.2 The course will cover:

- a. an introduction to petroleum products, their characteristics and classifications
- b. an overview of associated statutory regulations
- c. an overview of petroleum systems and the types of fuel installations on the MOD Estate
- d. an introduction to MOD Petroleum Safety Rules and Procedures
- e. the scope of the Petroleum Safety Rules and Procedures
- f. an overview of operational appointments
- g. the specific roles and responsibilities of appointed personnel with respect to Petroleum the Petroleum Safety Rules and Procedures
- h. hazards and risks associated with petroleum products and petroleum infrastructure
- i. isolation methodology
- j. personal and respiratory protective equipment
- k. test and safety equipment
- l. electrical work in petroleum areas
- m. management, application and control of Petroleum Safety Rules and Procedures Documentation
- n. implementation of the Safety Rules and Procedures on site and to tasks
- o. associated MOD and commercial documents

### **Learning outcomes**

- 6.4.3 On completion of the course, candidates shall be able to:
- a. list and differentiate petroleum products
  - b. demonstrate an understanding of the classification of fuels
  - c. identify systems within the scope of JSP 375, Volume 3, Chapter 5
  - d. list the roles and responsibilities of those parties with operational appointments relating to JSP 375, Volume 3, Chapter 5
  - e. identify hazards, risks and control measures associated with working with petroleum products and installations
  - f. identify the different test and safety equipment available; understand their use and limitations and inspection requirements
  - g. demonstrate knowledge of the AP Petroleum requirements for electrical work in petroleum areas
  - h. demonstrate a knowledge of the management, application and control of Petroleum Safety Rules and Procedures documentation
  - i. demonstrate an understanding of the planning required prior to start of works including AP Risk Assessments and Safety Programme and how they should be applied
  - j. produce suitable and sufficient AP Risk Assessments for typical tasks on petroleum installations
  - k. prepare Safety Programmes, Permits to Work and Standing Instructions in accordance with these Safety Rules and Procedures
  - l. state the action to take when there are conflicting requirements listed in statutory regulations, these Safety Rules and Procedures and any local rules
  - m. demonstrate an understanding of the requirement for demarcation agreements

### **Assessment**

- 6.4.4 By the end of the training, candidates are to have been formally assessed. The assessment will include:
- a. an open book examination, covering the topics identified above
  - b. an open book practical paper-based exercise involving the preparation of an AP Risk Assessment, Safety Programme and Permit to Work (up to completion stage)
- 6.4.5 On completion of the assessment, candidates will be graded as either, “Satisfactory” or “Unsatisfactory” and a certificate issued to that effect.
- 6.4.6 Candidates who gain an unsatisfactory grading shall submit themselves for re-assessment of the failed element(s), in order to have their grading reviewed. There is no requirement, to re-attend the entire course unless deemed necessary by the training provider in conjunction with the individual’s AE (or SAA in the case of an AE). The re-assessment is to be undertaken within three months of initially attending the course.

## **Acknowledgements**

These revised Safety Rules and Procedures have been produced by a joint Industry / Ministry of Defence working group comprising representation from the following contributing companies, organisations and individuals:

Interserve Defence Ltd  
Atkins Defence Asset Management  
Debut  
Babcock Infrastructure Services  
Turner Facilities Management  
Carillion  
Defence Infrastructure Organisation  
Citrus Training  
Develop Training

### Isolation Methodology

- A1.0** The isolation methodology used on the MOD Estate is to be based on the risk exhibited by the system and in the Health and Safety Executive publication 'The Safe Isolation of Plant and Equipment' HSG 253. This is the lead reference when determining isolation and control.
- A2.0** All isolation methods can fail. The potential for human failure is a major factor affecting the reliability of an isolation method. The performance of an isolation depends not only on the integrity of the isolation hardware, but also on the adequacy of the arrangements to identify each isolation point, secure the isolation, prove/monitor the isolation and maintain total control of the work. When selecting an isolation method, consideration should be given for the potential of both mechanical and human failure.
- A3.0** Security during the intrusive task is provided by the final isolation. An initial isolation may also be required to enable this final isolation to be installed. A range of isolation techniques are detailed in A10. The choice of final isolation method should be based on risk assessment. In the instance where an isolation of higher integrity is available, and where it is reasonably practicable to use, it should be used, except where this would not reduce risk.

#### Stages of Isolations

- A4.0** Installation of isolations can, involve two stages
- a. An initial isolation
  - b. A final or full isolation.
- A5.0** The initial isolation, which is usually a valve, enables draining and the insertion of downstream positive isolation once depressurised and drained. Positive isolation can take the form of a blank, spade or spectacle plate and can be accompanied by the removal of pipework sections. The safety of this initial isolation must be considered when selecting your final isolation method. A key requirement during the initial isolation is to identify whether valves being used provide an acceptable level of isolation. Physical disconnection should be used wherever reasonably practicable.
- A6.0** The final isolation protects those carrying out the work, and those who might otherwise be affected from a release of fuel or vapour from the system. For tasks involving confined space entry or where isolations are to be in place for an extended period of time positive isolations must be used where practicable.
- A7.0** When using valves for pipeline isolation, you should aim to achieve a double block and bleed isolation. Suitable blank flanges and / or plugs should be used to close off any open pipework. These should be appropriately rated and properly installed with the correct gaskets and securing bolts so that they can withstand the system pressure and product characteristics.
- A8.0** Localised isolation of pipelines can involve various techniques or combinations, e.g. valves, removable spool pieces, pipe freezing, line plugging, pipe stoppers, bags, high friction pigs or spheres, use of 'slugs' of inert fluids and flooding sections of pipeline with water.
- A9.0** Devices other than blanks, plugs or caps that are proposed to be used to seal the ends of open pipework to enable pressure testing or work activities will require a specialised assessment and approval by the AE. This includes specialised systems that provide local isolation as detailed in A8.

## **A10.0 Isolation Techniques**

### Positive isolation

Complete separation of the plant/equipment to be worked on from other parts of the system.

#### Example

- Physical disconnection (e.g. spool removal)

Valved isolation to an appropriate standard is required to enable positive isolation.

#### Example

- Double block, bleed (DBB) and spade
- Single block and bleed (SBB) and spade

### Proved isolation

The effectiveness of the valved isolation can be confirmed via vent/drain points before intrusive work commences. Within this isolation category the level of mechanical security is greatest for DBB and lowest for SBB.

#### Example

- Double block and bleed
- Double seals in a single valve body with a bleed in between
- Single block and bleed

SBB should not normally be used as a final isolation method; approval by the AE should be obtained where the use is considered justified and where the risk assessment has shown it to be acceptable.

### Non-proved isolation

The effectiveness of valved isolation can not be confirmed by vent/bleed points before intrusive work commences.

#### Example

- Double valve
- Single valve

**A11.0** Proposals to use non-proved isolation are to be agreed by the AE.

**A12.0** Further guidance is available in 'HSG 253 'The Safe Isolation of Plant and Equipment'.

**A13.0** It should be noted that if the point of work is in line then appropriate isolation is required either side of the point of work.

## **Electrical Isolation**

**A14.0** Electrical isolation for the purpose of petroleum maintenance may be made without reference to the AP (Electrical) when the isolation is via a switch or circuit breaker, and the switch or circuit breaker can be locked in the 'off' position by use of a safety lock.

**A15.0** When the isolation requires the removal of fuses or the disconnection of cable terminations the isolation is to be made by an appointed Skilled Person (Electrical) or an Authorised Person (Electrical).

#### **Fuel Oil Isolation**

**A16.0** Suitably competent personnel working for the MMO may isolate and carry out maintenance on a fuel oil supply pipework to an item of equipment provided that the fuel in question is Class III and that the work is within the confines of a boiler house, plant room or generator house.

## Annex B

# Electrical Works in Petroleum Hazardous Areas

### B1.0 Introduction

This annex covers work on or the testing of electrical equipment and systems within the defined hazardous area, as identified in accordance with the Dangerous Substances and Explosive Atmosphere Regulations (DSEAR), zonal classification drawings and associated risk assessments for petroleum installations on the MOD estate, which should be read in conjunction with the main Safety Rules and Procedures.

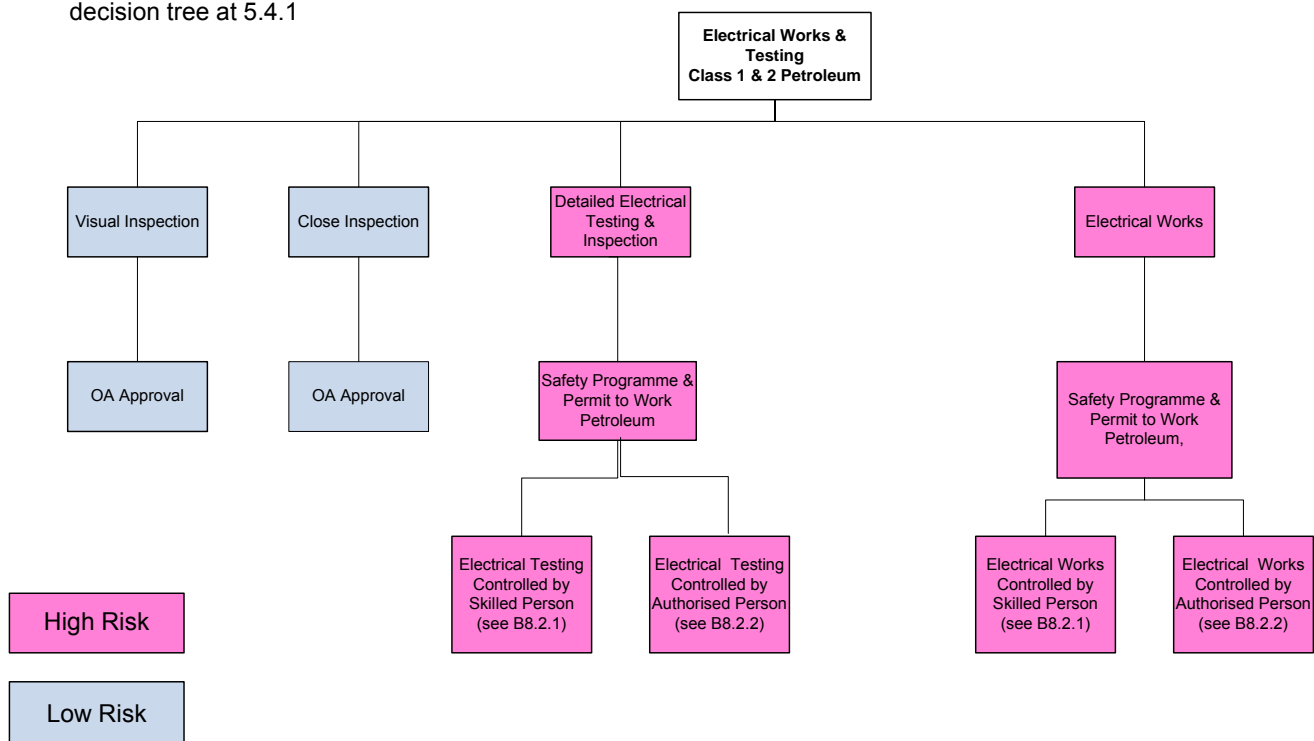
### B2.0 General

Electrical work and testing in petroleum hazardous areas are to be controlled in accordance with the JSP 375 Volume 3 Chapter 3 Electricity. Electrical work and testing in hazardous areas is to be under the overall control of the AP Petroleum.

The decision tree in 5.4.1 and this annex provides guidance on the level of control to be applied under these Safety Rules and Procedures and JSP 375 Volume 3 Chapter 3 Electricity. The AE Petroleum should be consulted for advice where works fall outside the scope of this guidance.

#### Electrical Works & Testing within Class I & II Petroleum Installations

Continuation from decision tree at 5.4.1



### **B3.0 Aspects of Electrical Work and Testing on Petroleum Installations**

There are five aspects of electrical work (incl. testing) on petroleum installations to be considered to enable the petroleum related risks to be controlled, by Safe Systems of Work described in this guidance. These aspects are in addition to the general requirements for the control of the electrical danger.

1. The integrity of the concept of protection of electrical equipment subject to maintenance must be restored when the maintenance is complete, and the integrity must be appropriate for the DSEAR hazardous zone classification for any new equipment installed. No alteration that will invalidate the certificate or other approval document relating to the protection of the electrical equipment or system is to be made.
2. Equipment must not be opened, or the protection disturbed, until it is electrically isolated and a gas free condition established, where identified as a control measure within the Task Risk Assessment, prior to proving dead.
3. Electrical testing can cause induced currents and voltages throughout an installation, due to earth bonding and lightning protection systems. To reduce the risks from incendive sparks and where identified as a control measure on the Task Risk Assessment, electrical testing is to be carried out under the control of a gas monitoring regime as detailed in B8 2.1 and 2.2.
4. Electrical testing within the hazardous areas is defined within BS EN 60079 part 17 as one of the following:
  - a. Visual Inspection, inspection undertaken without the use of tools or access equipment
  - b. Close Inspection undertaken with the use of tools and access equipment and may include minor repairs
  - c. Detailed Inspection, which requires the removal of covers to expose electrical connection and testing using test instruments

Visual and Close inspections are to be controlled by the AP's (Petroleum) RA, the Task Risk Assessment and Method Statement.

Detailed inspections are to be controlled by the AP Petroleum's Risk Assessment, Task Risk Assessment, Method Statement and Permit to Work Petroleum in accordance with requirements of JSP 375 Volume 3 Chapter 3 and JSP 375 Volume 3 Chapter 5 Decision Tree within this annex.

5. The maintenance of electrical equipment in hazardous areas shall be carried out by SKP Electrical having adequate training, experience, and theoretical knowledge to be considered as a competent person on electrical equipment installed in hazardous atmospheres.

### **B4.0 Planning and Co-ordination**

The planning of electrical work and testing at petroleum installations requires the AP Petroleum, AP Electrical and OA to co-operate and co-ordinate when defining the task, and deciding on the appropriate work method and completing an AP (Petroleum and Electrical) Risk Assessment, with particular emphasis on:

1. the elimination of the risk of creating a source of ignition within the hazardous area whilst undertaking the work.

2. the AP Petroleum's Risk Assessment is to identify the potential for the following:
  - a. product exposure
  - b. product atomisation due to elevated pressures
  - c. vapour drift from a higher classification fuel
  - d. elevated temperatures (either surface or ambient)
  - e. creation of an incendive spark
  - f. criticality of the electrical installation protection
3. electrical isolations as appropriate (to include control systems).
4. control of the Safe System for electrical work which is the responsibility of the AP Electrical.

#### **B5.0 Responsibilities of the AP Electrical**

The AP Electrical is responsible for:

- a. compliance with the Safety Rules and Procedures Electrical.
- b. appointing suitably qualified and experienced Skilled Persons (Electrical) to work on electrical systems in petroleum hazardous areas.
- c. co-ordination with the AP Petroleum, to include:
  - i. deciding on the requirement for Electrical Safety Documentation
  - ii. ensuring that the Task Risk Assessment and Method Statement are available and have been reviewed

#### **B6.0 Responsibilities of the Skilled Person**

The principle adopted is that of using SKPs appointed under the Electricity Safety Rules and Procedures to undertake the electrical task. SKPs Electrical are:

- a. to have sufficient training, knowledge, experience and understanding of the petroleum hazards
- b. to confirm by their signature that they have completed the works/tests correctly and document in accordance with BS EN 60079 part 17. The electrical equipment has been restored to the correct level of concept of protection, and the installation is suitable to be returned to service
- c. to carry out gas monitoring of the environment as required

#### **B7.0 Responsibilities of the AP Petroleum**

The AP Petroleum is responsible for:

- a. co-ordinating the electrical work or test with, and seeking the authorisation of, the OA

- b. implementing any control measures required as a result of the AP Petroleum Risk Assessment
- c. verifying the competence of the SKP Electrical for gas monitoring and confirming this has been carried out by making a statement in the PIOR

## **B8.0 Works Control**

### **B8.1 Electrical Works in a Class III installation**

Electrical work/tests within class III installation are to be controlled by a Standing Instruction Petroleum and the relevant parts JSP 375 Volume 3 Chapter 3 providing the following criteria are met:

- a. Those undertaking the task are to confirm with OA the cessation of product receipt, transfer and dispense and be satisfied that the residual risk would not result in the ignition of product.
- b. Table HAZ 3 of JSP 375 Volume 3 Chapter 3 is to be used where the clear and certain identity of the points of isolation of the circuit to be worked on is established or where as a result of the AP Petroleum review there is no foreseeable potential of:

exposure of product, atomisation of product, vapour drift (from a higher classification product);

or

elevated temperatures (either surface or ambient), and a source of an incendive spark

### **B8.2 Electrical Works in a Class I & II installation**

#### **B8.2.1 Permit to Work (Petroleum) & JSP 375 Volume 3 Chapter 3 Table HAZ 3**

Where the clear and certain identity of the point of isolation of the circuit to be worked on is established and where as a result of the AP Petroleum's review the only foreseeable risk is the potential presence of product vapour the AP Petroleum is to issue a Permit to Work Petroleum and carry out the initial gas monitoring checks in accordance with Annex C. The PIC will be responsible for the continuous gas monitoring and the recording in accordance with Annex C.

#### **B8.2.2 Permit to Work (Petroleum) & JSP 375 Volume 3 Chapter 3 Table HAZ 1 & 2**

Where the clear and certain identity of the point of isolation of the circuit to be worked on cannot be established or where the residual risk is such that there is a foreseeable risk of ignition of product vapour the method of control is:

AP Electrical is to control in accordance with electrical Safety Rules and Procedures.

AP Petroleum is to issue a Permit to Work Petroleum and carry out the initial gas monitoring checks in accordance with Annex C. The SKP Electrical will be responsible for the continuous gas monitoring and the recording in accordance with Annex C.

## **B9.0 Works outside DSEAR Hazardous Zones**

Works at the control room or the standby generator house of petroleum installations, that are wholly outside of the DSEAR classified hazardous zones will not require a Standing Instruction or Permit to Work Petroleum and are to be managed in accordance with the

Electrical Safety Rules and Procedures and is to be determined at the planning stage by the AP Electrical.

OA permission will be required for access and this shall be co-ordinated by the AP Petroleum.

*Note: there are many examples of Petroleum Installations at which the security fence encloses both areas classified as hazardous, and also a wider non-hazardous area which may contain such installations as control rooms and standby generator rooms. Works on such installations are usually in close proximity to the petroleum installation, and as they are within the security fence, is to be controlled as a minimum by the formal petroleum access procedures agreed for the establishment.*

# Gas Detection and Monitoring

## C1.0 General

- C1.1** It is a requirement of these safety rules and procedures to detect the presence, and concentration of flammable gases, oxygen and other hazardous substances identified in the AP Risk Assessment. This is needed to exercise the correct control over work within petroleum Hazardous Areas. For this purpose, a Multiple Gas Indicator (MGI) is to be used. Testing for the presence and concentration of flammable gasses, oxygen and other hazardous substances is a requirement of these Safety Rules and Procedures when the need is identified by the AP Risk Assessment. Appropriate MGIs shall be used in conjunction with Table C1.
- C1.2** Readings are to be taken before the commencement of any work, and during the work, to check that the gas concentrations and other levels are within the limits stipulated on the Permit to Work, as determined from this document and the Safety Programme.
- C1.3** There will be a requirement for individual readings by the PIC, and joint readings carried out by the AP and the PIC. These joint readings must be taken simultaneously with separate instruments.
- C1.4** Test frequencies and responsibilities shall be in accordance with Table C2.
- C1.5** Individual MGIs must be maintained, calibrated and used in accordance with the manufacturer's instructions and a Quality Assurance System. All records of calibration are to be kept for reference purposes.
- C1.6** Those using gas detectors must be appropriately trained, competent and understand their limitations.
- C1.7** Permits to Work must stipulate the maximum gas concentrations applicable to the type of work to be undertaken. A separate Permit to Work must be issued for each part of the work where working practices or requirements alter the maximum permissible gas concentration e.g. changes from cold work to hot work.

## C2.0 Flammable Gas

- C2.1** The maximum permissible flammable gas concentration levels for differing work activities are contained in Table C 1.

## C3.0 Other Gases

### C3.1 Oxygen

- C3.1.1** The safe range for Oxygen percentage is 19 – 22%.

### C3.2 Hazardous Substances

- C3.2.1** Historical information concerning products utilised previously and details of the current product (Safety Data Sheets, manufacturer's information) should indicate whether other hazardous substances could be present. The hazardous nature of any substances that are introduced into the work area as a result of the requirements of the particular task and any possible reactions (the hazards of these substances must be identified to ensure that they do not react adversely with any other products present) must also be considered. The AP

Risk Assessment should consider this information to determine if other hazardous substances require monitoring. This may include Volatile Organic Compounds, Carbon Monoxide or Hydrogen Sulphide. The HSE document EH40, Workplace Exposure Limits (in conjunction with the Control of Substances Hazardous to Health Regulations (COSHH) (as amended)) contains the required limits for hazardous substances.

**C3.2.2** Tanks, vessels or confined spaces, which contain residual fuel oil, sullage, or waste fuels, may be contaminated by Hydrogen Sulphide. If the AP Risk Assessment identifies this risk, then it should be monitored.

#### **C4.0 Response testing of MGI**

**C4.1** Instruments are to be “response tested” (sometimes known as a “bump test” or “field check”) before use (as a minimum unless manufacturer’s instructions are more stringent), in clear air conditions at or near the site of work to confirm their ability and response to expected gasses. This is done by exposing the MGI to a gas concentration that exceeds the high alarm set points. It should be done by applying a specific test gas to the MGI. The detail of the requirements for this test will vary between instruments; in all cases the manufacturer’s recommendations are to be followed.

#### **C5.0 Initial readings**

**C5.1** An Initial reading must be taken as follows:

- a. immediately before the associated work/inspection
- b. before entry into tanks or confined spaces
- c. when reaffirming
- d. when the AP decides it is necessary

#### **C6.0 Readings for open space work**

**C6.1** Readings should be taken at the location of the work, at any low lying locations such as drains, ducts, and excavations in the vicinity of the work. Readings should be taken at any temporary perimeters set up for the duration of the work; which must take into account the wind direction.

#### **C7.0 Reading within tanks or confined spaces**

**C7.1** Readings must be taken through the access point before entry. The AP is to be aware of the possibility of stratification of gases within undisturbed confined spaces.

**C7.2** On entering the confined space, areas liable to have higher gas concentrations e.g. pipeline entries, drain sump and low bottom plate levels on tanks, should be checked to confirm they are within the limits stipulated on the Permit to Work.

**C7.3** Pockets of combustible gas can be trapped under rust patches especially on the bottom plates of tanks. Any such patches should be removed by safe methods (determined by additional Task Risk Assessment) and further readings taken.

#### **C8.0 Readings for gas freeing operations**

**C8.1** There are two main purposes for taking gas readings during gas freeing operations;

- To confirm that the tested area is free from all hazardous and flammable gases.

- To establish whether normal minimum safety distances require extension. The aim is to achieve less than 1% of LEL at the boundary of the marked Restricted Area. If higher readings are recorded, the boundary must be extended.

- C8.2** If there is any wind, the readings to establish if a concentration less than 1% of LEL exists should be made at the Downwind Boundary (DWB) of the Restricted Area.
- C8.3** In still air conditions, readings must be made all around at the normal safety distance from the point of vapour emission and the restricted area boundary moved out if readings are not satisfactory.
- C8.4** The figures recorded on the Permit to Work and if necessary the Gas Concentration Continuation Sheet, are for the Down Wind Boundary (DWB), not the levels inside the confined space being ventilated.
- C8.5** It is the PIC's responsibility to monitor what is happening inside the confined space being ventilated and record their findings in accordance with local arrangements.
- C8.6** When ventilating confined spaces it may be necessary to switch off any ventilation arrangements (e.g. fans), before taking a reading in order for the atmosphere to stabilise. This will avoid the possibility of reading the gas concentration only in the ventilated air stream.
- C9.0 PIC monitoring**
- C9.1** The PIC must continuously monitor the gas concentration whilst work is in progress within the confined space.
- C10.0 Recording of readings**
- C10.1 Recording of initial reading**
- C10.1.1** The highest initial reading obtained, simultaneously by the AP and the PIC using two instruments will be recorded immediately.
- C10.2 Repeat readings**
- C10.2.1** The minimum frequency for recording readings is given in Table C 2.
- C10.2.2** These readings will be recorded on the reverse of the Permit to Work or when necessary on the Gas Concentration Monitoring Sheet.
- C10.2.3** The highest intermediate readings required to be taken will be recorded by the PIC.
- C10.2.4** The highest confirmatory readings required to be taken will be recorded by both the AP and the PIC.
- C10.2.5** Both intermediate and confirmatory readings will be entered onto the AP's copy and signed for by the Person in Charge on the next visit to site by the AP Petroleum.
- C11.0 Final readings**
- C11.1** Both the AP and PIC must carry out final readings, and they must agree that the combustible gas level is below 1% LEL before dismantling Restricted Areas and prior to cancelling any Permit to Work.

**Table C 1 Flammable Gas Concentrations for Activities**

TYPE OF ACTIVITY	READING (% of LEL)	REMARKS
(a)	(b)	(c)
Entry to tanks, confined spaces and vessels, for visual inspection	Less than 20%	Entry of personnel for visual inspection only and use of tools is not permitted.
Sludge removal from tanks, confined spaces and vessels	Less than 20%	Entry of personnel for the removal of leaded or otherwise contaminated sludge.
Cold Work	Less than 10%	Any mechanical works where the tool or work piece temperature remain below 100°C
Hot work	Less than 1%	See definitions.
Electrical work/test	Less than 1%	Any intrusive work on electrical equipment in hazardous areas which can induce current and voltage to flow with the possibility of incendive sparks.
Grass Cutting at Class I and II installations	Less than 1%	Use of mechanically driven grass cutting devices in hazardous areas

**Table C 2 Minimum frequencies of recording readings**

TYPE OF WORK	READING RECORDED BY	MINIMUM FREQUENCY THAT READINGS ARE RECORDED
(a)	(b)	(c)
1. HOT WORK a. Before commencement  b. 2 <sup>nd</sup> reading  c. Intermediate readings whilst work proceeds  d. Confirmatory test whilst work proceeds	AP and PIC  AP and PIC  PIC  AP and PIC	Initial and before start of work daily  Ten minutes after starting  Hourly  2 Hourly
2. ELECTRICAL WORK a. Before Commencement  b. Intermediate Readings whilst work proceeds  c. Confirmatory test whilst work proceeds	AP and PIC  PIC  AP and PIC	Initial and before start of work daily  Hourly  2 Hourly
3. CONFINED SPACES  a. Before commencement  b. Intermediate readings whilst work proceeds  c. Confirmatory test whilst work proceeds	AP and PIC  PIC (taken by entrant and communicated to PIC)  AP and PIC	Initial and before entry daily  2 Hourly  4 Hourly
4. GRASS CUTTING CLASS I INSTALLATIONS  a. Before commencement  b. Confirmatory test whilst work proceeds	AP and PIC  AP	Initial and before work starts daily  Continuous testing with records for each potential point of release made at fifteen minute intervals

TYPE OF WORK	READING RECORDED BY	MINIMUM FREQUENCY THAT READINGS ARE RECORDED
(a)	(b)	(c)
<p>5. GRASS CUTTING CLASS II INSTALLATIONS</p> <p>a. Before commencement</p> <p>b. Intermediate readings whilst work proceeds</p> <p>c. Confirmatory test whilst work proceeds</p>	<p>AP and PIC</p> <p>PIC</p> <p>AP and PIC</p>	<p>Initial and before start of work daily</p> <p>4 Hourly</p> <p>8 Hourly</p>
<p>6. COLD WORK</p> <p>a. Before commencement</p> <p>b. Intermediate readings whilst work proceeds</p> <p>c. Confirmatory test whilst work proceeds</p>	<p>AP and PIC</p> <p>PIC</p> <p>AP and PIC</p>	<p>Initial and before start of work daily</p> <p>3 Hourly</p> <p>6 Hourly</p>
<p>7. GAS FREEING CLASS I AND II TANKS AND CONFINED SPACES</p> <p>a. At commencement</p> <p>b. 2nd Reading</p> <p>c. Intermediate readings whilst gas freeing</p> <p>d. During first 8 hours of gas freeing</p>	<p>AP and PIC</p> <p>AP and PIC</p> <p>PIC</p> <p>AP and PIC</p>	<p>Initial and before start of work daily</p> <p>Ten minutes after starting</p> <p>Hourly</p> <p>2 Hourly</p>
<p>After the first 8 hours</p> <p>e. Intermediate readings whilst gas freeing</p> <p>f. Confirmatory test whilst work proceeds</p>	<p>PIC</p> <p>AP and PIC</p>	<p>3 Hourly</p> <p>6 Hourly</p>

<b>TYPE OF WORK</b>	<b>READING RECORDED BY</b>	<b>MINIMUM FREQUENCY THAT READINGS ARE RECORDED</b>
<b>(a)</b>	<b>(b)</b>	<b>(c)</b>
In addition to the above readings, the Person in Charge must monitor the gas concentration continuously whilst work is in progress		

\* The frequency of readings may have to be increased in changeable weather conditions particularly when Class I products are involved.

**C12.0 Equipment requirements for gas monitoring**

- C12.1** The monitor is to be selected from petroleum industry standard equipment, with proven effective use in the industry in similar application areas.
- C12.2** The equipment must be robust and suitable for use as a tool to aid maintenance operations, not simply a laboratory type scientific instrument, and must be portable.
- C12.3** The temperature and humidity range over which the instrument is required to operate should be specified to the manufacturer, who in return should state the operating range for their instrument.
- C12.4** A risk assessment should be conducted by the AP to determine the particular type of gases/products to be detected. This can form part of the initial site review.
- C12.5** The sensors must be suitable for the particular products to be monitored.

**C13.0 Performance requirements**

- C13.1** The following features are considered to be a minimum requirement:
  - a. Audible and/or visual alarm, (minimum 85 db(A) at 1m, or above ambient sound levels), for the following items:
    - i. % LEL – Flammables
    - ii. % Oxygen
    - iii. PPM H<sub>2</sub>S (instant, TWA, STEL)
    - iv. fault
    - v. low-level battery
  - b. LEL, H<sub>2</sub>S and O<sub>2</sub> display
  - c. continuous monitoring of product
  - d. an appropriate level of explosion protection for the potentially explosive atmospheres that it is to be subjected to
  - e. an appropriate level of environmental protection for the hazardous environment that it is to be subjected to
  - f. confidence beep (normally every 30 seconds)
  - g. robust outer casing to protect the instrument
  - h. remote sampling probe
  - i. backlit display
  - j. scale calibrated in % for LEL, % for Oxygen
  - k. parts per million (ppm) for Hydrogen Sulphide

**C13.2** When switched on, the following messages on the instrument should be displayed:

- a. due date for next calibration
- b. battery life remaining
- c. self-diagnostics check

**C13.3** Instruments should display the following marking:

- a. CE mark
- b. Intrinsic Safety Classification
- c. ATEX Classification

**C13.4** Time waited average (TWA) for any other Hazardous Substance or gas identified by the AP risk assessment and in accordance with EH40.

**C13.5** Lower Explosive Limit setting shall be adjustable over the desired range via Multiple Gas Indicator keypad or PC/Laptop, access via user password.

#### **C14.0 Inspection requirements**

**C14.1** Prior to use, the AP must check that the Multiple Gas Indicator selected for use is fit for purpose. These checks include:

- a. the instrument is of the correct type for the gases to be monitored
- b. the total condition is acceptable e.g. no apparent damage and/or suitable for hazardous environment
- c. indicator is within calibration date and an in-date certificate of calibration is available
- d. indicator has been response tested in accordance with manufacturers recommendations
- e. correct Lower Explosive Limit, Gas or Hazardous Substance Alarm setting has been applied
- f. suitable remaining battery life remains for the proposed task

**C14.2** If there is doubt over the suitability of the proposed Multiple Gas Indicator then an alternative indicator must be used.

# **Personal Protective Equipment and Respiratory Protective Equipment**

## **D1.0 Personal Protective Equipment (PPE)**

The provision of PPE must be in accordance with the requirements of the Personal Protective Equipment at Work Regulations (Health and Safety Executive ACOP L25). It is the employer's responsibility to ensure that suitable equipment is provided and must be selected as a result of risk assessments in accordance with the Management of Health & Safety at Work Regulations by the PIC or MMO for self delivery. The minimum requirements for the type of PPE to be worn are stipulated in Table D1. The type required must be stated on the Permit to Work.

The materials of any PPE for use where the risk is petroleum products must be certified, by the supplier in accordance with British/European Standard(s), as fit to afford protection from exposure to the petroleum products or other harmful substances which are likely to be encountered. The suit, gloves and boots used in potentially explosive atmospheres must also be made from anti-static material.

The risk of exposure to petroleum products and the risk associated with regards to harmful chemical compounds vary depending on the task being undertaken, the petroleum product being exposed and the location. The class of PPE to be worn is to be after undertaking a hierarchy of elimination, such that the use of PPE is the last line of control and in accordance with the risk assessments for the task.

There are number of types of PPE equipment and these are outlined below:-

### **a. Non Gas Tight Type 2**

A full suit with integral pressure hood all of light coloured material which meets the requirements of BS EN 943 part 1 Type 2 non-gas tight for connection to a continuous breathable air supply by PVC hose which are to the requirements of BS EN 14594. The suit shall meet the permeation by petroleum product in accordance with BS EN 14325 and BS EN 468. The gloves are of light coloured and met the requirements of BS EN 374.

Type 2 Personal Protective Equipment is completed with boots, which are to meet the requirements of BS EN 345.

### **b. Type 3 & Type 4**

Overalls complete with hood are to meet the requirement of BS EN 14605. type 3 and type 4, and can be used with a separate air hood or blouse for use with air line mask fed from air bottles' or with fall face mask to BS EN 137. The selection of RPE is to be in accordance with HSG 53. Gloves which meet the requirements of BS EN 374 and are to be suitable for the task they are applied to. Knee high boots which are to meet the requirements of BS EN ISO 20345.

### **c. Basic PPE**

Flame retardant overalls correct to BS EN ISO 11612 and gloves which meet the requirements of BS EN 374 and are suitable for the task being undertaken.

## **D1.1 Wearing and Cleaning**

The requirements of this document must be observed when dressing into, removing, and cleaning PPE. The requirements for washing after use of the equipment are to be in accordance with manufacturer's recommendations.

## **D1.2 Maintenance**

The employer and employee are responsible for PPE and other Safety Equipment (e.g. harnesses, rescue lines). For example, the AP must ensure that equipment provided by the MMO is regularly inspected to ensure that it is safe for use.

Equipment must be inspected daily prior to use, and otherwise, at monthly intervals. A record of the monthly inspection and any servicing is to be kept in the PIDR where the equipment is provided by the MMO.

## **D2.0 Respiratory Protective Equipment (RPE)**

### **D2.1 Classification**

There are two distinct types of Respiratory Protective Equipment (RPE) devices:

- a. filtering devices: these purify the ambient air to be breathed using filters able to remove contaminants in the air
- b. Positive Pressure Breathing Apparatus: these supply the wearer with breathable air from either compressed air line or compressed air cylinders worn by the wear from an uncontaminated source and shall comply with the requirements of BS EN 12021 regarding quality of air

### **D2.2 Equipment Standards**

All RPE must conform to the legislative requirements of BS EN 529 (E) and HSG 53 RPE at Work, or any subsequent updates.

All breathable air shall be from sources which have been tested in accordance with BS EN 12021.

It is the responsibility of the equipment owner to ensure that the equipment complies with the above, and to provide written evidence of compliance. If written evidence cannot be provided, the equipment must not be used.

### **D2.3 Correct type of RPE**

The correct type of RPE is to be selected and worn as a result of risk assessments conducted by the PIC or MMO for self delivery in accordance with reference to HSG 53. An example form from HSG 53 can be found in Part 2 Model Forms.

### **D2.4 Training in the Use of RPE**

The employer should ensure that supervisors, wearers and others involved in the maintenance and use of the RPE receive suitable training. Refresher training should be provided as necessary; this should be at least annually unless otherwise decided by individual risk assessment.

### **D2.5 Wearing of RPE with Spectacles and Beards**

A good face seal cannot be achieved with the face piece by a person wearing normal spectacles or facial hair. Alternative RPE such as a full suit and or hood; is to be used when a poor seal is indicated. Fitting should be undertaken in accordance with HSG 53.

#### **D2.6 Disinfection of RPE**

All RPE must be cleaned and disinfected after use in accordance with manufacturer's instructions. The equipment should be stored in accordance with the manufacturer's instructions.

#### **D2.7 Use of Cylinders**

Compressed air cylinders in use in a confined space must be provided with a protective cover. This removes a possible source of a spark particularly from steel cylinders, and prevents accelerated corrosion of any damaged areas of the cylinders. The protective covers can normally be supplied by the cylinder supplier.

A system of control must be in place for the use of Breathing Apparatus supplied from cylinders or other containers, in order to ensure that the work period is contained within the limited available air supply time, including the time to safely egress the work area.

#### **D2.8 Maintenance of RPE**

Where RPE is provided for use, a system of inspection and maintenance must be put in place in accordance with HSG 53. The system should include an inspection for correct functioning before and after each occasion of use, and also at monthly intervals. A record of the monthly inspections and servicing shall be made available to the AP. Where the equipment is the property of the MMO, then adequate maintenance and usage records are to be maintained in accordance with the requirements of HSG 53.

Servicing is to be limited to that detailed in the manufacturer's user manual, and no attempt is to be made to replace components or make adjustments or repairs beyond the manufacturer's recommendations. Valves and regulators must be returned to the manufacturer at the intervals stipulated for servicing, repair and calibration. Evidence of fitness for use must be available for each set of RPE for presentation to the AP on request.

The AP must ensure that the above system is in place for equipment which he issues. It is important to note that any site maintenance conducted on RPE must be carried out by a competent person.

#### **Canister Filters**

Gas filters and combined filters conforming to BS EN 14387 (Specification for gas filters and combined filters used in RPE), for use with full face masks, fall into three classes:

- a. Class 1 – Low capacity
- b. Class 2 – Medium capacity
- c. Class 3 – High capacity

#### **D2.9 Air hoses**

### **D2.9.1 Examination**

All air hoses are to be examined daily before and after use for physical deterioration, e.g. cracks, holes or thinning of walls due to abrasive wear. Hoses found to be defective must be immediately withdrawn from service and repaired or discarded as applicable. Any such withdrawals, repairs or disposal should be recorded.

### **D2.9.2 Recording of Use**

A record must be kept of the number of hours air hoses are used on leaded tanks. After 100 hours use on leaded tanks, the hoses should be scrapped and this should be recorded. Hoses must be disposed of as hazardous waste.

### **D2.10 Use of contractors' air hoses and compressors**

Where employees are required to use Contractors' air hoses and air compressors, they are to obtain written confirmation before using the equipment, from the PIC that the equipment conforms to the requirements of HSG 53, BS EN 529 (E), BS EN 14594, BS EN 14953 and the air quality has been tested in accordance with BS EN 12021.

## **D3.0 Guidance on the Use of RPE and PPE**

### **D3.1 Selection of RPE and PPE**

In selecting RPE and PPE the following factors should be taken into consideration:

- a. types of work to be undertaken
- b. period of time the PPE is exposed to 'Wet' work with the product
- c. frequency of use
- d. quantities and type of suitable equipment
- e. suitability/range of application of equipment

### **D3.2 Use of Open Circuit Breathing Apparatus**

In the circumstances described in the preceding paragraph, the use of Positive Pressure Open Circuit RPE when used with Type 3 & 4 PPE, with air bottles carried by the wearer, or from bottles mounted on a cradle, should be considered. This type of equipment obviates the need for compressors, and air and water filters which are required when constant flow type apparatus is used.

### **D3.3 Conditions Requiring the Use of Type 2 PPE**

Type 2 PPE which incorporates RPE must be used for cleaning and maintenance work in tanks currently storing leaded fuels.

Appropriate quantities of this type of equipment should be kept for such conditions. In assessing the appropriate quantities the following circumstances should be taken into consideration:

- a. changeover from Aviation Leaded Gasoline fuels to AVTUR
- b. entry into leaded fuel tanks is much less frequent for other tasks, with the main exception of tanks at large MOD installations, and the periodic inspection of AVGAS installations

### **D3.4 RPE for Work outside Tanks**

The criteria for renewal of the filters is subjective, the wearer must leave the contaminated area, and remove the RPE and replace the filter when there is an indication of the onset of additional breathing effort. There is a need to record the period of use of RPE used for gas or vapour elimination. It is necessary to change filters before they become saturated with the gas or vapour, rather than attempt to rely on the user's sense of smell to detect the onset of saturation.

Such equipment must not be used by personnel who have a temporary or permanent problem with their sense of smell. Filter media is detailed in HSG 53 and Annex C to BS EN 529 (E) or any subsequent updates and the manufacture of the filter cartridges.

**Table D1: Combinations of PPE and RPE**

<b>PPE</b>	<b>RPE</b>
<b>Non Gas Tight Type 2</b>	
<b>Type 3 &amp; 4</b>	<b>By Risk Assessment in accordance with HSG 53</b>
<b>Basic PPE</b>	<b>By Risk Assessment in accordance with HSG 53</b>

**Table D2: Hazardous situations and examples of RPE and PPE when the conditions of paragraph D 3.1 apply**

HAZARDOUS SITUATION	RPE GRADE	COMMENTS ON PPE
Entry to a Class I petroleum product tank for work.	Integral to suit.	Type 2 suit enclosing the entire body.
Risk of exposure to a major spillage of Class I petroleum liquid.	Integral to suit.	Type 2 suit enclosing the entire body.
Leaded or other toxic sludge in tanks.	Integral to suit.	Type 2 suit enclosing the entire body.
Leaded sludge outside of tanks.	Determine by Risk Assessment.	Type 3 & 4 chemical resistant suit.
Exposure to FSII within FSII tanks.	Integral to suit.	Type 2 suit enclosing the entire body.
Entry to AVTUR-F34 & AVCAT – F44 tank which has water bottom (possible high FSII concentration).	Integral to suit.	Type 2 suit enclosing the entire body.
Exposure to AVTUR-F34 & AVCAT – F44, for example, working on drained and open filter vessels, including the handling of elements.	Determine by Risk Assessment.	Likelihood of dripping, splashing or spraying liquid petroleum product will determine grade of PPE required by risk assessment.

HAZARDOUS SITUATION	RPE GRADE	COMMENTS ON PPE
Entry to any tank with a gas reading of over 1% LEL for the purpose of cleaning or work for extended periods.	Integral to suit.	Type 2 suit enclosing the entire body.
Inspection of class II and class III tanks or work of short duration (less than 15 minutes) when the gas level is above 10% of LEL.	Determine by Risk Assessment.	Likelihood of dripping, splashing or spraying liquid petroleum product will determine grade of PPE required by risk assessment.
Entry to fully drained, clean and well-ventilated tank or confined space with gas concentration reading less than 1% LEL, and with an oxygen level within permissible limits.	Breathing Apparatus may not be required. (Working in Confined Spaces Regulations 1997 still apply.).	Basic PPE may be required.
Exposure to petroleum products in outside conditions where the gas concentration is above 1% LEL.	Determine by Risk Assessment.	Likelihood of dripping, splashing or spraying liquid petroleum product will determine grade of PPE required by risk assessment.
Exposure to petroleum products in outside conditions where the gas concentration is below 1% LEL.	Breathing Apparatus may not need to be worn and may be required at hand in case of elevated gas concentrations during work.	Likelihood of dripping, splashing or spraying liquid petroleum product will determine grade of PPE required by risk assessment.
Exposure to FSII additive outside the tank, working on injection equipment and pipework.	Determine by Risk Assessment.	Likelihood of dripping, splashing or spraying liquid petroleum product and additive will determine grade of PPE required by risk assessment.

# Guidance on Grass Cutting

## E1.0 Introduction

- E1.1** Grass and vegetation, especially in dry conditions, represent an increased risk of fire at petroleum installations. Wherever possible they should be permanently removed from the hazardous area; where this is not possible the procedures in this annex must be followed.
- E1.2** This annex provides guidance for grass cutting within the defined hazardous areas of petroleum installations on the MOD estate, and should be read in conjunction with part 1 of this Chapter.

## E2.0 Procedures

- E2.1** Grass cutting is to be controlled by the use of a Permit to Work and the appropriate gas monitoring regime as detailed in table C2 to Annex C.

## E3.0 Works planning

- E3.1** Planning of works prior to grass cutting is required by the AP and prospective PIC.
- E3.2** This will require an AP Risk Assessment. A Safety Programme will not normally be required for grass cutting unless the AP identifies a requirement for isolation.
- E3.3** It is acceptable for the prospective PIC to use a generic Task Risk Assessment and Method Statement grass cutting providing the following requirements are met:
- only one service provider has been contracted to undertake grass cutting within the petroleum hazardous areas for a specific site
  - the PIC has been appointed as a SKP
  - task Risk Assessment and Method Statement are provided by the Contractor and reviewed by the AP prior to the issue of a Permit to Work
  - should the AP consider the Task Risk Assessment and Method Statement inadequate a Permit to Work cannot be issued
  - the AP is to record in the PIOR that the Task Risk Assessment has been reviewed and is acceptable
  - Task Risk Assessment provided defines relevant hazards, risks and control measures to be taken against each Method Statements Method Statement must cover the procedure to be followed for grass cutting on each class and type of fuel installation within the site
  - the Contractor is to revise the generic Method Statements should work practises alter
  - copies of the generic Task Risk Assessments and Method Statements are to be retained in the PIDR

## E4.0 Points of gas readings

- E4.1** Prior to commencement of grass cutting the AP and the prospective PIC are to walk the area where the grass is to be cut, to identify any hazards that may restrict the grass cutting operation. This would include potential fuel leaks, and incomplete works by others such as open trenches; any additional hazards identified may require a separate risk assessment to be raised.
- E4.2** The AP is to undertake readings at any high risk areas which exist in close proximity to sources of vapour release such as tank vents. Low points such as fuel pits are to be

inspected and tested for vapour. All gas readings must be below 1% of the Lower Explosive Limit.

**E4.3** The AP and prospective PIC must record the highest reading of the two MGIs used on the Permit to Work; repeat readings are to be taken in accordance with table C 2 to Annexe C..

**E4.4** If during repeat gas tests a reading above 1% LEL is experienced, work is to cease, and grass cutting equipment withdrawn. The team other than the PIC must also withdraw until such time as the readings reduce to below 1% LEL.

**E5.0 Grass cutting on Class I Installations**

**E5.1** With Class 1 petroleum products the possibility of vapour drift from potential sources of release must be assumed during grass cutting, even when all transfer operations have stopped.

**E5.2** Internal combustion engine driven grass cutters can be used providing the following procedure can be followed:

- a. all petroleum transfer operations that could cause a vapour hazard are to cease
- b. all OA's personnel are to be withdrawn from the hazardous area
- c. combustible gas levels remain below 1% LEL

**E5.3** Where the procedure in E5.2 cannot be followed internal combustion engine driven grass cutters cannot be used.

**E5.4** Electrically driven grass cutters are not to be used.

**E5.5** The AP and PIC must remain on site whilst grass cutting is in progress.

**E5.6** The AP must continually monitor combustible gas readings at the risk locations.

**E5.7** The AP must record the combustible gas readings as per table C2.

**E6.0 Grass cutting on Class II Installations**

**E6.1** Class II petroleum products are less volatile than Class I and internal combustion engine driven grass cutters can be used providing the following procedure can be followed:

- a. all petroleum transfer operations that could cause a vapour hazard are to cease
- b. all OA's personnel are to be withdrawn from the hazardous area
- c. combustible gas levels remain below 1% LEL

**E6.2** Where the procedure in E5.2 cannot be followed internal combustion engine driven grass cutters cannot be used.

**E6.3** Electrically driven grass cutters are not to be used.

**E6.4** The PIC must remain on site whilst grass cutting is in progress.

**E6.5** The PIC must monitor combustible gas readings at the risk locations as per table C2.

**E6.6** The PIC, and where required AP, must record the combustible gas readings as per table C2.

**E7.0 Grass cutting on Class III Installations**

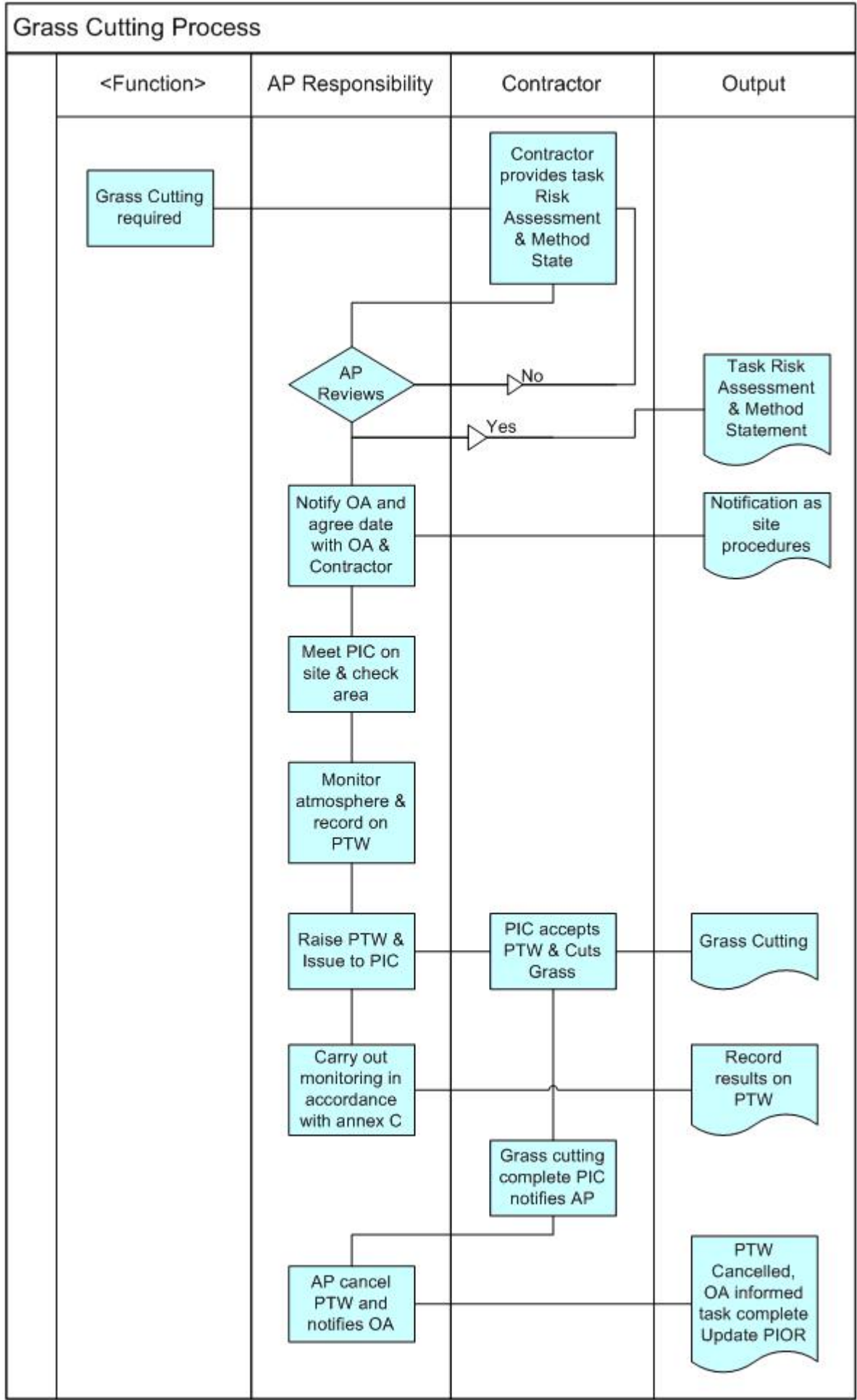
**E7.1** There are no requirements to control grass cutting under these Safety Rules and Procedures at installations containing Class III fuel products and no restriction on grass cutting equipment as long as the products remain unheated.

**E8.0 Removal of cuttings**

**E8.1** All grass cuttings are to be removed from the fuel installation and disposed of in accordance with current waste legislation.

**E9.0 Use of weed killers**

**E9.1** Where weed killers are used to control vegetation they must be of the type conforming to the MOD List of Permitted Chemicals in the Standard Specification for the Supply and Application of Herbicides.



## **Guidance on Restricted Areas**

### **F1.0 Determination of Restricted Areas**

The extent of safety distances at different types of petroleum installation and the distances from uncontrolled areas are clearly defined for hazardous areas depending on the class of petroleum product handled and the type of installation concerned. These distances are determined by the OA.

In restricted areas there may well be variables, depending upon the type of work carried out and the particular circumstances prevailing, that make it impractical in all cases to follow the same precise distances defined for the boundaries of hazardous areas. The extent of a restricted area requires individual interpretation on a case to case basis. The guidance given in this Annex relates to the principal factors involved, and is intended to assist those responsible for determining the extent and any special requirements of a restricted area.

### **F1.1 Dispersal of Gas**

The dispersal of flammable gas in air, to the extent that it ceases to be flammable, must be considered in relation to sources of possible ignition. It is essential that all factors that may influence the assessment of a restricted area are fully examined to ensure that the likely simultaneous existence of flammable gas/air mixture, together with a source of ignition, cannot occur. This can best be achieved by logical and progressive analysis taking into consideration all of the possible factors which may be involved.

#### **Setting Up a Restricted Area**

Normally a Restricted Area is established to accomplish a planned task. However, the possibility exists for such an area to be established in an emergency.

#### **Planned Work**

A restricted area must be set up when the works are being controlled under a Permit to Work or when excavation works are being undertaken and there is a risk that petroleum liquid or vapour may be present in the surrounding ground.

### **F2.0 Emergency Situations**

#### **F2.1 Sources of Escape of Petroleum**

All means must be taken to avoid sources of release and to prevent accidental escape. Whenever possible, any unavoidable escape of flammable liquid should be limited to the minimum quantity thus limiting the associated vapour, vapour spread, and risk. Where accidental releases occur, a Restricted Area will be required to control the area where the release has taken place.

#### **F2.2 Cessation of Operations**

Many sources of release of vapour and spillage of liquid petroleum can occur at installations during normal operations. Typical sources of release include: release from vents on tank filling, filling of lorries and containers, and leaks from seals of pumps. For this reason all operations must be stopped in a restricted area, and personnel removed from the area, to avoid the reintroduction of a petroleum risk to an area has been made safe. There is also the

basic safety requirement that operations must cease to permit isolation, and to prevent accidental releases during maintenance.

Consideration must also be given to any contingent operation carried out by the OA adjacent to the restricted area, which could result in a release of gas into the area or introduction of a source of ignition. Such operations depending on circumstances must be stopped, to enable the works activities to be conducted safely.

### **F2.3 Site and Weather Conditions**

These can play an important part in the safety of works and the safety consequences of works action. Consideration must be given to both site and weather conditions including the following:

- a. type of petroleum product involved
- b. presence of valve and drainage pits, drains and ducts
- c. excavations and nature of ground surfaces and gradients
- d. proximity of public thoroughfares
- e. proximity and nature of adjacent operations

In assessing weather conditions, account should be taken of wind direction, velocity and the potential for electrical storms. The AP should be prepared to react to changes in conditions. A change in wind direction may cause a change in the boundary of the restricted area.

Escaped petroleum gas, although heavier than air, may be carried upwards by wind currents, and in still air conditions, may linger. The latter presents a very serious risk at low levels. The potentially hazardous area that can be formed may therefore vary during the period of the planned work or the emergency situation, and must be monitored. Wind direction and strength should be determined by the use of a wind indicator located at high level, or in an exposed position free from shelter from the wind in any direction.

Wind direction must also be determined so that sources of air required for Breathing Apparatus and other equipment can be situated in an up wind location.

### **F2.4 Extent of Restricted Area**

#### **F2.4.1 Method of Measurement**

Normally the minimum extent of areas will be as for hazardous areas and be measured at a radius prescribed horizontally from the outer limits of the location when a hazardous atmosphere could occur and should be defined as follows:

- a. Class I installations - 15 metres
- b. Class II and III installations - 6 metres
- c. Filling and Service Stations metering pumps/dispensers - 4.25 metres (For hot work a minimum of 6 metres is required)

The minimum extent of the restricted area should be measured from the source of petroleum release or the edge of a potential spillage area.

#### **F2.4.2 Extent of Areas for Gas Freeing**

The large volume of petroleum gas and air mixture released during gas freeing operations, particularly when highly volatile Class I product is involved, may result in gas concentrations above 1% of Lower Explosive Limit spreading beyond normal safety distances in certain weather conditions. This situation is unlikely when Class II petroleum is involved, but could occur in certain conditions such as when gas freeing above ground tanks in hot climates.

In still air conditions, gas concentrations above 1% of Lower Explosive Limit are more likely to spread at low level beyond the normal Hazardous Area safety distances. This situation is therefore the most hazardous for gas freeing operations.

Gas concentrations must be carefully monitored at the boundaries of normal Restricted Areas, particularly at the commencement of gas freeing operations, and during the first 8 hours (see Annex C). Action must be taken before commencement of gas freeing operations to eliminate any possible sources of ignition as far as reasonable and practicable in the immediate areas surrounding the normal safety distance for the Hazardous Area, including downwind boundaries in windy conditions.

Additional warning signs and markings must be readily available should extension of the Restricted Area be required.

### **F2.4.3 Conditions during Gas Freeing Operations**

Maintenance, operation or any other type of work is not permitted in a restricted area whilst the gas freeing of Class I and II petroleum installations is in progress.

#### **Removal of Sources of Emission of Gas**

In circumstances where it is not practicable to meet the safety distances from the source of emission of gas described in F2.4 of this Annex, it may be possible to move such a source to a safe distance through extension to vents and pressure release valves. The AE should be contacted for guidance where safety distances cannot be met.

#### **Health Risks from Petroleum Vapour**

The presence of petroleum vapour can present a health risk, as well as an ignition risk. The AP must be aware of the potential risks of exposure of personnel to petroleum vapour and provide direction to the PIC on the Permit to Work. Particular care is required with Class I products due to the risks of exposure to highly volatile organic lead compounds (toxicity), as well as the risk of the petroleum vapour (flammability).

In cases of doubt on the matters described in the setting up and assessment of Restricted Areas, the AE should be consulted.

## Classification of Principle Petroleum Products

The following identifies the principle petroleum products found on the MOD estate and their classification that are controlled under these Safety Rules and Procedures. Should there be doubt on product identification or class, after referencing the safety data sheets then the AE should be contacted for further guidance.

### G1.0 Flashpoint Classification

Class 0	Liquefied Petroleum Gases (LPG)
Class I	Liquids that have flash points below 21 °C
Class II (1)	Liquids that have flash points from 21 °C up to and including 55 °C, handled below their respective flash point temperature
Class II (2)	Liquids that have flash points from 21 °C up to and including 55 °C, handled above their respective flash point temperature
Class III (1)	Liquids that have flash points from 55 °C up to and including 100 °C, handled below their respective flash point temperature
Class III (2)	Liquids that have flash points from 55 °C up to and including 100 °C, handled above their respective flash point temperature
Unclassified	Liquids that have flash points above 100 °C

Reference: EI (IP) Model Code of Practice (MCOP), Part 15 & JSP 317

### G2.0 Petroleum Products

Petroleum Class	Typical examples	Typical flash point (°C)	Remarks
0	LPGs, ethylene, propylene	Not applicable	
I	Gasoline (petrol)  Avgas Avtag wide cut jet fuel (JP4 and Jet B)	- 45  - 46  - 25	F-57 (MTGAS) F-67 (ULGAS) F-18 F-40
II	Aviation turbine fuel  Kerosene: - Premium grade - Regular grade	38 minimum  43 minimum 38 minimum	F-34 (AVTUR-FSII) F-35 (AVTUR)  KERO/A KERO/B
III	Aviation turbine fuel – high flash type  Furnace Fuel Oil Diesel fuel Gas Oil	61 minimum  55+ 55+	F-44 (AVCAT-FSII)  3/50 FFO F-54, DIESO UK, DIESO MT,F-76
Unclassified	Atmosphere residues Heavy fuel oils	>100 >100	

Reference EI (IP) MCOP Part 15 and DEFSTAN 01-05

### G3.0 Fuel Oil Classifications

Category	Crude Fraction	Primary Application
A1	Middle distillate	Automotive diesel fuel.
A2	Middle distillate	Agricultural engine fuel.
C1	Kerosene	Flue-less heating appliances.
C2	Kerosene	Vaporising or atomising domestic heating appliances.
D	Middle distillate	Atomising burners for domestic, commercial or industrial applications.
E - H	Residual distillate	Atomising burners for boilers or certain industrial engines, which may require pre-treatment or additives.

*Reference BS 2869*

There may be conditions or countries where ambient temperatures are high enough for the handling temperature of Class II or Class III petroleum products to be above the respective flash point classification. In these circumstances the condition must be assessed and where necessary the product classification raised. Where petroleum products of different classes are mixed, the mixture is classified as the liquid having the lower flash point, unless flash point determination tests show otherwise.

## AP Petroleum Risk Assessment

### H1.0 Introduction

This annex provides guidance on Petroleum risk assessment.

### H2.0 Hazards

The significant hazards associated with conditions and procedures covered by these Safety Rules and Procedures are:

- a. Petroleum liquid product
- b. Petroleum vapours
- c. Static electricity
- d. Electricity
- e. Hydrogen Sulphide
- f. Micro-Biological contamination
- g. Confined spaces
- h. Moving vehicles
- i. Additives

### H3.0 Risks

The risks associated with the above hazards are:

#### Fire/Explosion

- a. As well as from residual product, a fire and explosion hazard may also arise from the work process. For example if solvents are utilised for cleaning purposes, or coatings applied to steel work which may be oil based or any other flammable material which may give off sufficient vapours to form a flammable mixture.

#### Respiratory

- a. Respiratory hazards can be present in many forms, including toxic vapours, particles from welding, painting and other procedures undertaken. These can result in potentially serious pulmonary conditions and other ill health problems.

#### Asphyxiation

- a. Through inflow of fluids, oxygen deficiency

#### Oxygen Deficiency/Enrichment

- a. Oxygen deficiency (below 19% by volume) can be caused by the presence of other gases (inert gases), the rusting of bare metal surfaces and microbial action depleting the oxygen

level. Damp or humid conditions in a tank and the use of naked flames can also reduce oxygen levels.

- b. Oxygen enrichment (above 22% by volume) can be caused by operations which involve equipment using oxygen, e.g. oxy-acetylene cutting, when leaks from equipment or supply hoses can occur. The release of oxygen to the confined space must be avoided, through proper equipment maintenance and correct operating procedures.

#### Poisoning/Toxicity

- a. Can be from direct handling of the product and ingestion, resulting from poor personal hygiene, incorrect use of RPE/PPE or inadequate RPE/PPE. This can result in breathing problems from inhalation and dermatitis/skin disease or complaints from direct contact.

#### Dermatitis/Skin disease or complaints

- a. Medical checks, personal hygiene and PPE (controls not risks). Can be from direct handling of the product, incorrect use or inadequate PPE.

#### Environmental

- a. Environmental contamination of the soil and of water courses can result from release of product if not suitably contained. Mitigation measures should be considered at the planning phase and include careful isolation and draining and following spillage procedures.

#### Electricity

- a. All electrical equipment should be isolated. Can result in electrical burns, shock and death. All electrical equipment must be isolated.

#### Micro-Biological

- a. Micro-organisms, when present in petroleum products, can proliferate when in contact with water or sludge at tank bottoms. There is also a possibility of microbiological growth in the form of slime on the tank walls at the interface of the water bottoms and underlying water itself.
- b. When such contamination is suspected or found, an additional risk assessment must be carried out.

#### Temperature

- a. Heat stress risks can develop through elevated temperatures when working within confined spaces, working in PPE/RPE and/or created by the work process itself.

### **H4.0 Considerations**

The following is a summary of areas to be considered when preparing the AP Risk Assessment:

- a. Biological
- b. Chemical (chemicals present, chemical reactions)
- c. Electrical (electric shock, plant isolation, incendive sparks)

- d. Environmental (spillage, contamination)
- e. Explosion (ignition sources, flammable mixture)
- f. Fire (ignition sources, vapour, gases, fire appliances)
- g. Flow (plant isolation)
- h. Plant (weight, size, location, access/egress)
- i. Poisoning
- j. Pressure (uncontrolled release, controlled release)
- k. Temperature (of fluids and equipment/plant items)
- l. Emergency Procedures including:
  - i. Rescue (access, egress, equipment)
- m. Type of fuel
  - i. Hydrogen sulphide may be present.
  - ii. May contain additives, e.g. 'FSII', which is a toxic additive in aviation fuel.
  - iii. Flash point.
- n. Type of storage tanks
  - i. Entry points, area of work, pipework connections, heating coils, suction points, floating arms, top hatches, side entry doors and cathodic protection fitted.
- o. Ancillary equipment.
  - i. Pump units, electrical and mechanical isolation.
  - ii. Tank gauging systems, temperature gauges, alarm and level control devices,
  - iii. Remote operated valves.
- p. Work Methods
  - i. Type of cleaning method

#### **H4.1 Cathodic Protection Systems**

Where works are carried out on fuel installations installed with a cathodic protection system the following must be considered during the planning stage:

- a. Before any break is made in cathodically protected metallic pipelines or plant, the impressed current system is to be switched off and disconnected 24 hours before commencement of the work
- b. Both sides of the intended pipeline break are to be electrically bonded together and earthed. It is important that electrical continuity is maintained throughout cathodically protected pipelines or plant to prevent the formation of incendive sparks during maintenance.

#### **H4.2 Electrical Storms**

The likelihood of electrical storms should be checked prior to commencement of, and during, work, as when they occur, all work must be stopped and all personnel, tools, plant and equipment withdrawn from the area. When there is a high risk of electrical storms prior to start of work, consideration should be given to the risks posed in commencing the task.

#### **H4.3 Fire Precautions**

When hot work is to be conducted at petroleum installations, risk assessments shall consider the necessary fire precautions relevant to the site. Co-ordination of works activities between the OA, AP and the base or local authority fire and emergency services shall be undertaken.

#### **H4.4 Tank Cleaning**

Tank entry, gas freeing and internal cleaning of the tank are probably the most hazardous works undertaken on a petroleum installation. The decision to proceed with any work requiring tank entry, and the prerequisites prior to tank entry must be properly planned and include the reinstatement of the installation to its normal operating condition.

A checklist (PET 06) is included on Part 2 to assist APs undertaking this task. The checklist is for work on petroleum installations holding fuels and their respective additives. It does not cover work on tanks containing other chemical products in their concentrated form such as anti-freeze compounds, icing inhibitors and specialist compounds.

## **Medical Requirements**

- I.1** There are two aspects for medical requirements when working on petroleum installations on the MOD Estate.
- a. Medical or health fitness of the personnel carrying out the work
  - b. Medical or health surveillance of all personnel
- I.2** The referenced regulations require all work to be risk assessed by a competent person; there is a requirement on the employer to consider the health, fitness and condition of an employee to perform a particular task.
- I.3** Assessing the hazards to health for personnel in petroleum installations is particularly important when working in tanks.
- I.4** The following factors should be considered for the wearers of personnel protective and respiratory protective equipment:
- a. Total fitness of wearer
  - b. Lung-function
  - c. Respiratory disorder
  - d. Tendency to claustrophobia
  - e. Mobility and agility.

### **I.5 Total Fitness for RPE Use**

Everyone who wears RPE must be endorsed medically fit prior to commencement of work, and is to produce certification to that effect with their competence documentation. The medical certification must be completed by a qualified medical practitioner.

### **I.6 Surveillance**

All personnel who are exposed to substances hazardous to health should have in place, as identified by the risk assessment, a health surveillance programme. This should be drawn up by the employer, with guidance from the occupational health advisor.

### **I.7 References**

- a. HSE. Respiratory Protective Equipment at Work: A practical guide HS (G) 53.
- b. HSE. The Control of Substances Hazardous to Health (COSHH) Regulations (as amended) Approved Code of Practice and Guidance, L5.
- c. Energy Institute (EI). Medical standards for fitness to wear respiratory protective equipment. Information for physicians. (Formerly and Institute of Petroleum (IP) publication).
- d. HSE. Management of the Health and Safety at Work Regulations (MHSWR) ACOP L21 Regulation 6, Health Surveillance.
- e. EI. Guidance on Health Surveillance. (Endorsed by HSE Chief Medical Advisor)
- f. Associated OCTEL Guidance.
- g. EI. Model Code of Practice – part 16: tank cleaning safety code.
- h. Control of Lead at Work Regulations (CLAW). Approved code of practice and guidance. ACOP L132.
- i. CONCAWE (The oil companies' European organisation for environment, health and safety) documentation.
- j. MOD. JSP375 Volume 2 Leaflet 49 RPE.

## Signs, Notices and Posters

### J1.0 Poster

The requirement for the provision of a Petroleum Safety Poster has been removed and is replaced by a Petroleum Safety Rulebook, which is extracted from JSP 375 Volume 3 Chapter 5 Petroleum.

### J2.0 Permanent Notices

#### J2.1 Hazardous Areas

It is the responsibility of the OA to ensure that permanent notices, warning of petroleum hazards and risks are prominently displayed on all approaches to petroleum installations, to warn all those entering the facility of the hazards and control measures.

JSP317 - Joint Service Safety Regulations for the Storage and Handling of Fuels & Lubricants details that whenever petroleum products are stored or handled, even in small quantities, hazardous conditions can arise. The extent of all hazardous areas is therefore to be clearly indicated by the use of notices such as for Class I installations 'PETROLEUM SPIRIT – HIGHLY FLAMMABLE – NO SMOKING – NO NAKED LIGHTS', conspicuously displayed in the appropriate languages, with other appropriate hazard warning and supplementary signs conforming in shape, size and colour with the requirements of the Health and Safety (Safety Signs and Signals) Regulations 1996. Examples of the appropriate signage may be found in the current edition of JSP317.

#### J2.2 Leaded Fuel Tanks

A permanent notice must be displayed for all those tanks which have contained leaded fuel and fall within the leaded fuel tank definition. Such tanks include those which currently contain leaded or unleaded gasoline, and those tanks which have contained leaded or unleaded gasoline in the past, and have not been treated to establish a lead free condition. The notice currently employed (see Figure 1) is as detailed below with the wording "Danger this tank has contained leaded gasoline" and, "Do not enter unless prescribed regulations are complied with".



Figure 1 Example sign – Leaded Tanks

### J2.3 Schematic Diagrams

Schematic diagrams of petroleum installations and systems are to be displayed at all bulk fuel installations. These should be displayed in control rooms and or pump houses. The diagram should detail all pipes runs, with identification numbers of all tanks, pumps and valves.

Schematic diagrams are not required to be displayed for small petroleum installations and mechanical transport fuelling installations (MTFI).

### J3.0 Temporary Notices

#### J3.1 Restricted Area Notices

Temporary notices are to be displayed at the points of access at all locations where restricted area maintenance work is being conducted.

Temporary notices are to be held at each location with a responsibility for maintenance of petroleum installations. The notice currently employed (see Figure 2) is as detailed below with the wording "DANGER - RESTRICTED AREA MAINTENANCE WORK IN PROGRESS - NO ADMITTANCE WITHOUT AUTHORITY"



Figure.2 Example sign – Maintenance Work in Progress

# Works Organisation at Product Receipt Enclosures

**K1.0** The Product Receipt Enclosure (PRE) contains the equipment associated with the termination of the supply pipeline to the base. The Oil and Pipeline Agency (OPA) arrange the operation and maintenance of the off base pipeline system, with pipelines operated by one of a number of contractors.

## **K1.1 Defining Responsibility for Equipment**

The responsibility for equipment, and its operation and maintenance, is vested in the OPA.

As defined the PRE should be an enclosed area (although there are examples where this is not the case). In addition, there can be on base facilities which are the responsibility of the base for operation and maintenance, located in the PRE.

There is a need to formally establish the lines of demarcation of the facilities, the operational and maintenance responsibilities, and the co-ordination and co-operation of all parties when works are required.

A written statement should be secured from the pipeline operator, defining the equipment which is his responsibility. The OPA is required to notify the customer when works are to take place at the PRE, so that the implications of such works for the base/establishment can be assessed. Equally, it is necessary to advise the pipeline operator when works are planned on fuel installations in the proximity of or directly related to the PRE.

## **K1.2 Communications prior to Works at the PRE**

Strong operating links are required between the MMO and the pipeline operating company. Formal communication between the pipeline operator and the MMO should be engaged at the planning stage for all works activity at the PRE, and all works activity on-base facilities which have an impact on the PRE, due to the proximity of the works or otherwise. The aim of this communication in the works context is to ensure that unsafe conditions are avoided. For example, gas freeing an airfield tank, whilst hot work is being performed at a nearby PRE.

The pipeline operating company will control works at the PRE using their standard safe system of work.

## **K1.3 Management of the Risks of Works at the PRE**

The MMO must have time and opportunity to consider the effect of the works at the PRE on other petroleum installation works on site and must co-operate with the pipeline operator. The details/consequences of the works for an assessment of the general effect on operations at the base must be provided to those with total base safety responsibilities.

## Definitions

### L1.0 Specific Definitions for the Petroleum Chapter.

#### **AE Petroleum (AE PET)**

As defined with JSP 375 Volume 3 Chapter 2, but with specialism in petroleum.

#### **AP Petroleum (AP PET)**

As defined with JSP 375 Volume 3 Chapter 2, but with specialism in petroleum.

#### **Boundary Valve**

Point of demarcation between the government oil pipeline operators (OPA) and the Maintenance Management Organisation (MMO) for the site/establishment.

#### **Bulk Fuel Installation (BFI)**

An installation where large quantities of fuel, normally aviation fuel, are stored, quality checked and dispensed to a consumer.

#### **Classes of Petroleum Products**

The following are in accordance with current guidance: -

**Class I:** Liquids which have a flash point below 21 degrees C.

**Class II:** Liquids which have a flash point from 21 to 55 degrees C inclusive.

**Class III:** Liquids which have a flash point above 55 degrees C, up to and including 100 degrees C.

**Unclassified:** Liquids which have a flash point above 100 degrees C.

See annexes G and H for further examples and guidance; always reference the specific safety data sheet (SDS or MSDS) for the product handled.

#### **Cold Work**

Cold work includes the use of tools for erection, dismantling and cleaning, which are not liable to produce incendive sparks, and work such as drilling, tapping and cutting carried out in such a way as to limit the heat produced and keep the temperature of the tools and work below 100 degrees C.

#### **Combustible**

Combustible refers to any substance solid, liquid or gas which will burn with the application of heat.

#### **Confined Space**

A confined space is a place which is substantially enclosed (in most cases), and where serious injury can occur from hazardous substances or conditions within the space or nearby (e.g. lack of oxygen).

### **Dangerous Fumes**

Fumes in a concentration, or mixture with air, of an obnoxious, harmful or dangerous nature, arising from gases or vapours generated from products and materials, from welding and the use of heat-generating tools or the application of protective coatings, particularly in unventilated spaces.

### **Dangerous Occurrence**

An incident which may give, or has given rise to, injury to a person or damage to plant and/or equipment, as defined by RIDDOR.

### **Down Wind Boundary (DWB)**

Furthest point of the restricted area and located down wind of the point of work or release of petroleum product, point of monitoring with MGI/CGI to ensure that there is no explosive vapour.

### **Electrical Testing**

Electrical testing within hazardous areas is defined within BS EN 60079 part 17; a summary of the three inspection criteria is given below:-

#### **Visual inspection**

Inspection which identifies, without the use of access equipment or tools, those defects, such as missing bolts, which will be apparent to the eye

#### **Close inspection**

Inspection which encompasses those aspects covered by a visual inspection and, in addition, identifies those defects, such as loose bolts, which will be apparent only by the use of access equipment, for example steps, (where necessary), and tools

Note: Close inspections do not normally require the enclosure to be opened, or the equipment to be de-energized.

#### **Detailed inspection**

Inspection which encompasses those aspects covered by a close inspection and, in addition, identifies those defects, such as loose terminations, which will only be apparent by opening the enclosure, and/or using, where necessary, tools and test equipment

### **Flammable (Synonymous with Inflammable)**

Refers to any substance, be it a solid, liquid, gas or vapour, which in the presence of air, is easily ignited. The addition of the prefix 'non' shall indicate that the substances are not readily ignited, but does not necessarily indicate that they are non-combustible. See also 'Combustible'.

### **Flashpoint**

The lowest temperature at which a liquid gives off sufficient vapour in air to form a flammable mixture.

### **Gas**

A term used in accordance with the practice of the Petroleum Industry and MOD, for example, in gas detection. The term is also used to describe petroleum vapours, and the residual vapour in tanks which must be removed before tank entry.

### **Gas Concentration**

A concentration of gas expressed as a percentage of the Lower Explosive Limit.

### **Gas detector**

An indicator designed to measure the concentration of Hydrocarbons, Oxygen, and other gases, such as Hydrogen Sulphide (H<sub>2</sub>S), depending on the requirement and the type of sensors fitted. This will encompass a number of variations of meters available, including Multiple Gas Indicators (MGIs), combustible or flammable gas indicators (CGIs). See also 'response test'.

### **Gas-Free**

An environment is said to be gas free when the following conditions are all met:

- a. A gas test shows that the concentration of gas is below 1% of the Lower Explosive Limit
- b. When it is free from all fuel and residues
- c. When it is free from vapour drift from any source.

### **Hazardous Area (on account of explosive gas atmospheres)**

The area surrounding a location or petroleum asset as defined and specified by the OA / Hazardous Area Manager / or other representative of the establishment and which is indicated by fences, notices or other means. Within this boundary can be contained the physical 'hazardous area' and possibly areas that would be deemed non-hazardous.

Non-hazardous area (on account of explosive gas atmospheres): *an area in which an explosive gas atmosphere is not expected to be present in quantities such as to require special precautions for the construction, installation and use of equipment.*

Examples of sub-assets within the fenced area but outside the physical hazardous area may be the control/rest room within a bulk fuel installation (BFI) or a Hazardous Waste Compound (incorporating petroleum products).

Refer also to 'Restricted Area'. The 'Restricted Area' may extend beyond the defined or fenced area of a petroleum installation.

**Hazardous Area Manager:** A person having control of works and other defined responsibilities within a Hazardous Area.

### **Hot Work**

This includes welding, the use of any flame or electric arc, and the use of any equipment likely to cause heat, flame or incandescence including non certified electrical equipment. It also includes caulking, chipping, drilling, riveting and any other heat-producing operation, unless it is carried out in such a way as to keep the temperature of the tools and the work below 100 degrees C, whilst also preventing the creation of incandescence sparks.

### **Hydrogen Sulphide, H<sub>2</sub>S**

A gas which is very toxic on inhalation and highly flammable.

### **Incandescence Spark**

A spark of sufficient temperature and energy to ignite a flammable gas

### **Lead**

A toxic alkyl compound (tetraethyl lead or tetra methyl lead), which may be present in gasoline and is still added to aviation gasoline, refer to the Manufacturer's/Material Safety Data Sheet (MSDS).

### **Lead-Free**

- a. Any tank, vessel or equipment which has at no time contained gasoline. Note that so called unleaded gasoline contains lead, and tanks which contain that product can therefore not be classed as lead free.
- b. Any tank, vessel or equipment which has contained leaded fuel and the whole of which has been blast cleaned and internally epoxy coated and is free from damage.

### **Lower Explosive Limit (Synonymous with Lower Flammable Limit), LEL, LFL**

The percentage by volume of gas in a mixture of gas and air below which no explosion will take place, the minimum concentration needed for ignition, hence below this will not ignite with the application of an ignition source. Refer also to Flash point and upper explosive limit.

### **Joint checks**

This is a specific requirement for the monitoring of combustible gases, oxygen levels and other gases by both the AP and the PIC with two appropriate gas indicators/monitors and recording of the highest reading of the two readings on the permit or other document as required.

### **Mechanical Transport Fuelling Installation (MTFI)**

Filling and Service Stations (Kerbside Pump Installations), installations for the receipt, storage and issue of petroleum products directly into the fuel tanks of vehicles for the sole use of those vehicles, and for the occasional filling of portable containers.

### **Multiple Gas Indicator, (MGI)**

See Gas Detector.

### **Operating Authority, (OA)**

The term is used in two related contexts, one use is to represent the line manager (either RN, RAF, Army, USF or civilian body) having total control of the operation of a petroleum installation, filling and service station or plant storage facility. In this context the OA is the officer with delegated authority for the operation of the petroleum installation. The alternative use of the term is to describe the total Service OA which defines the rules for handling petroleum at Service installations.

### **Personal Protective Equipment, (PPE)**

Overalls, headgear, eye protection, footwear, gloves, and other equipment intended for the protection of personnel against contamination by petroleum products. Type and grade subject to task being undertaken and risk assessment in accordance with Personal Protective Equipment at Work Regulation 1992 and Annex 'D'.

### **PET**

General abbreviation for petroleum used throughout this document, for example, AP Petroleum, and petroleum installation, to emphasise the source of the hazard to maintenance operations. May also be known as POL – Petrol Oil Lubricant.

### **Petroleum Installations Operating Record (PIOR)**

A site record listing significant events associated with petroleum installations in a chronological order.

### **Petroleum Installations Document Register (PIDR)**

A site specific document containing details of the petroleum installations and safety equipment held on site.

### **Product Receipt Enclosure (PRE)**

Enclosure normally located at the site boundary where fuel is received in to the site via the Government Pipeline or Sub-sea pipeline from tankers.

In the case of a PRE connected to the Government pipeline the equipment is operated and maintained by the Oil Pipeline Agency (OPA) in conjunction with the fuel supplier.

### **Response test**

This is the testing prior to use of the gas detector (MGI), used to monitor a space is free from flammable gas, correct oxygen level and other duties as required. The response test will be carried out using a known gas. Manufacturer's instructions must be consulted.

### **Restricted Area**

A temporarily defined area, normally but not necessarily in a Hazardous Area, in which, owing to the nature of the work to be undertaken, a release of petroleum product or liquid is possible thus giving rise to an increased risk of:

- a. Fire.
- b. Explosion.
- c. Asphyxiation.
- d. Poisoning from toxic sludge, fumes, gas or dust.

### **Respirator**

See RPE equipment.

### **Respiratory Protective Equipment, (RPE)**

Respiratory Protective Equipment selection of type equipment subject to assessment in accordance with Personal Protective Equipment at Work Regulation 1992 and HSG 53, for further information refer to Annex 'D', all equipment must have Health and Safety Executive approval and CE marked.

### **Rescue Line**

A line used in conjunction with a safety rescue harness.

### **Resuscitation Apparatus**

A portable apparatus for supplying oxygen, to assist resuscitation; for use only by specifically trained personnel.

### **Safety Key Box (SKB)**

SKBs are secure boxes with either two unique locks or one unique lock and the facility to fit a multi-hasps. Refer JSP375 Volume 3 Chapter 2 Section 4.3.

### **Safety Lock (SL)**

Safety Locks are padlocks indelibly painted red having only one key which is different from all other keys in use. Each SL is to be marked with a unique identification number and its key is to be labelled with the same number. When the SLs are in use the safety keys are to be kept in a Safety Key Box (SKB).

### **Safety Rescue Harness**

A harness worn when working in a tank or confined space to facilitate the removal of the wearer in an emergency, used in conjunction with a safety line.

**Safety Rule Book**

A booklet that is to be issued to all skilled persons to enable them to become familiar with the requirements of the MOD safety rules and procedures and a reference when conducting works in hazardous areas (petroleum). This booklet should not be used as a standalone document.

**Senior Authorising Authority (SAA)**

As defined within JSP 375 Volume 3 Chapter 2, but with specialism in petroleum.

**Sullage**

Also known as 'Bilge Water' collects from a ships deck and may contain water, fuel, oil, urine, detergents, solvents, chemicals, pitch, particles, and so forth and should be regarded as hazardous. A main hazard may be Hydrogen Sulphide (H<sub>2</sub>S).

**Upper Explosive Limit (UEL or UFL)**

Also known as upper flammability limit, where the concentration of gas reaches its highest concentration in air to burn when introduced to an ignition source. Once this concentration is exceeded the gas mixture will not burn, as the gas concentration in air is too rich. See also flash point and lower explosive limit.

# **PART 2**

# **MODEL FORMS**

**PET 01 - Petroleum Installation Operating Record (PIOR)**

Date & Time of Operation	Location & Identity of Equipment	Event Or Operation * and Reason	Signature

Rule off each entry

Page No

MoD Health & Safety Handbook  
 JSP 375 Volume 3 Chapter 5 Petroleum Installations  
**PET 02 - AP Risk Assessment**

RISK ASSESSMENT & CONTROL				Risk <i>Assessment No: Unique reference number</i>			
Site:		Location:		Sheet No:      of			
Date:		Date					
Activity: <i>Description of work to be carried out</i>							
Significant Hazards	Applicable To (Persons affected)	Risk Rating Before Control Measure		Control Measures	Risk Rating After Control Measure		
		High (tick)	Low (tick)		High	Low	
<i>Significant Hazards listed here</i>	<i>Person at risk – consider all</i>			<i>List those control measures in</i>			
<i>including any other work being</i>	<i>person at risk not just those</i>				<i>place to mitigate the identified</i>		
<i>undertaken in the vicinity.</i>	<i>carrying out the work</i>				<i>hazards</i>		
Further Considerations:							
Task Method Statement Required	Yes [ ]	No [ ]	OA permission Required	Yes [ ]	No [ ]		
COSHH Assessment Required	Yes [ ]	No [ ]	Manual Handling Assessment Required	Yes [ ]	No [ ]		
Confined Spaces Assessed	Yes [ ]	No [ ]	Electrical Permit Required	Yes [ ]	No [ ]		
Other – Please specify	Yes [ ]	No [ ]	Asbestos insulation or gaskets	Yes [ ]	No [ ]		
Assessment carried out by:			I have read, understood and will implement all control measures indicated on this Risk Assessment				
Signed: Name:			Signed:.....				
Date:.....			Name:.....				
For .....			Date:.....				
For .....			For and on behalf				
of .....			of.....				

**PET 03 - Safety Programme**

Site: \_\_\_\_\_ Location: \_\_\_\_\_ AP Risk Assessment No: \_\_\_\_\_

**Part 1 To be completed by the Authorised Person (Petroleum):**

The type of installation \_\_\_\_\_

The proposed works are on the following installations and equipment: \_\_\_\_\_

The proposed time and date for start and completion of work:

Start Time & Date \_\_\_\_\_ Completion Time & Date: \_\_\_\_\_

Product		Class		Leaded	Yes/No*	Toxic	Yes/No*
Maximum Permissible Gas Concentration	Identified in Work Sequence	Permissible Oxygen Level		Min 19% - Max 22%			
Other Gas Identified..... Maximum Permissible Gas Concentration		Associated Safety Documentation					
Respiratory Protective Equipment required	Yes/No*	Type identified in Work Sequence	Personal Protective Equipment required		Yes/No*	Type identified in Work Sequence	
Ventilation required	Yes/No*	Type identified in Work Sequence	Additional Safety Equipment		Yes/No*	Type identified in Work Sequence	

\* Delete as necessary

Signed: \_\_\_\_\_ (AP) \_\_\_\_\_ Time & Date: \_\_\_\_\_

Name (Print): \_\_\_\_\_ Telephone: \_\_\_\_\_

In the employ of: \_\_\_\_\_

**Counter Signature**

Signed: \_\_\_\_\_ Time & Date: \_\_\_\_\_

Name (Print): \_\_\_\_\_ Telephone: \_\_\_\_\_

In the employ of: \_\_\_\_\_ Appointment \_\_\_\_\_

**Part 2 Authorisation**

As Operating Authority I declare that the work can be carried out.

Name (Print): \_\_\_\_\_ Signed: \_\_\_\_\_ Time & Date \_\_\_\_\_

**Part 3 Work sequence**

Entry No	Location & Identity of Installation, Valve or Component Part	Event or Operation & Reason	Max LEL	RPE	PPE	Additional Items required	Date & Time of Operation

**Part 3 Work sequence (Continued)**

Entry No	Location & Identity of Installation, Valve or Component Part	Event or Operation & Reason	Max LEL	RPE	PPE	Additional Items required	Date & Time of Operation

**Part 4 Cancellation**

As Authorised Person Petroleum I declare that permits associated with this safety programme have been completed or stopped and have been cancelled and the system has been visually inspected for integrity.

This Safety Programme is hereby cancelled.

Name (Print):

Signed:

Time & Date

**Part 5 Return of Installation**

As Operating Authority I confirm the return of the installation for normal operations.

Name (Print):

Signed:

Time & Date

**NOTES**

- (a) The Operating Authority is to authorise the work by signing at part 2 of the Safety Programme.
- (b) The Operating Authority is the duty holder for the petroleum installation in accordance with JSP 317.
- (c) The Safety Programme is not complete until the proposed work sequence has been implemented and dated.
- (d) A copy of this Programme is to be issued to the Operating Authority on authorisation and retrieved at completion of task.
- (e) The cancelled original of this Programme is to be filed in the Document Register.
- (f) Unused lines in the Work sequence are to be marked through with diagonal lines.

**PET 04 - Permit to Work Petroleum**

Site:		Location:		Equipment:	
Safety Programme No:		Safety Programme Entry No:	Task Risk Assessment No:		Safety Key Box No:
Associated Safety Documentation:					
Validity from:	hrs	Date:	Validity to:	hrs	Date:
Contact No.	Fire:	Med:	OA:	AP:	PIC:

**Part 1 Authorisation**

The works to be carried out are as follows .....

.....

.....

.....

.....

**Initial Gas Concentration Monitoring**

Max Gas level Permissible	%LEL	Oxygen level Permissible	19-22%	Other Gas .....	
Initial Gas level POW	%LEL	Initial Oxygen POW	%	Other Gas POW	
Initial Gas level DWB	%LEL	Initial Oxygen DWB	%	Other Gas DWB	

I am in receipt of and have reviewed the above Task Risk Assessment including the control measures and the task method statement. Where necessary I have carried out, with the Person in Charge, initial gas concentration checks at the Point of Work (POW) and where a restricted area has been set up the Down Wind Boundary (DWB). I confirm that it is safe to carry out the work authorised in accordance with the MOD Safety Rules and Procedures, subject to these conditions being maintained.

Name (print) ..... Signature..... Time & Date.....  
 Authorised Person

**Part 2 Acceptance**

I accept responsibility for controlling the works detailed in Part 1. I have reviewed the above Safety Programme have been shown all aspects of the isolation and have been issued the Safety Box Key. Where necessary I have carried out with the Authorised Person, initial gas concentration checks at the Point of Work (POW) and where a restricted area has been set up at the Down Wind Boundary (DWB). I confirm that no attempt will be made by me or any person under my control to carry out work not authorised on this permit.

Name (print) ..... Signature..... Time & Date.....  
 Person in Charge

**Part 7 Completion**

I declare that all persons, equipment, tools and instruments under my control have been withdrawn and that the works detailed in Part 1 have been:

**\*(a) satisfactorily completed.**

**\*(b) stopped and abandoned** and that the system has been made safe pending further works, the reasons for stopping the work and the actions taken are detailed in Part 6 overleaf.

Name (print) ..... Signature..... Time & Date.....  
 Person in Charge

**Part 8 Cancellation**

I declare that the works detailed in Part 1 have been completed/stopped\* and that the permit is cancelled.

Name (print) ..... Signature..... Time & Date.....  
 Authorised Person

\* Strikethrough as appropriate

Part 3 Gas Concentration Monitoring							
Repeat Test	Test Location	Time	Date	Gas % Level	O <sub>2</sub> % Level	Other Gas .....	AP Signature PIC Signature
Test 1							
Test 2							
Test 3							
Test 4							
Test 5							
Test 6							
Test 7							
Test 8							
Test 9							
Test 10							
Continued on Gas Concentration Monitoring Form(s).....							

Part 4 Suspension							
The Authorised Person & Person in Charge are to ensure the site is left in a safe condition and record the date and time of the suspension.							
Date	Time	PIC Signature	AP Signature	Date	Time	PIC Signature	AP Signature

Part 5 Handover / Reaffirm							
If the Authorised Person or the Person in Charge are to change or if the job is to re-start after an overnight shutdown, then joint checks must be carried out and recorded (including gas reading) to establish that the conditions at part 1 of this permit can still be met.							
Once done the oncoming Authorised Person and Person in Charge must sign below to affirm the authorisation and acceptance of safety rules and procedures appertaining to this permit.							
This Permit is Reaffirmed				Authorisation of AP		Acceptance by PIC	
From		To		Name	Signature	Name	Signature
Time	Date	Time	Date				

Part 6 Stopped Works
The following are reasons for stopping the work and the actions taken:
.....
.....
.....
.....

Book No .....(Pre-Printed)..  
Serial No .....(Pre-Printed)..

### PET 05 - Standing Instruction

Site: .....

Person in Charge: .....

In the Employ of:.....

Issue Date: ..... Expiry Date: ..... (Not more that 3 years from issue)

Location and identity of the petroleum equipment to which this instruction applies:  
.....

#### Part 1 Authorisation

Tasks and/or operations to be undertaken on the equipment specified above:

- 1) .....
- 2) .....
- 3) .....
- 4) .....

Circumstances, under which the above tasks or operations are to be undertaken, and any special instructions or safety measures (including task risk assessment and method statement numbers):

.....  
.....  
.....

Signed: ..... Authorised Person  
Name (print): ..... Time & Date .....

In the employ of: ..... Contact Tel No. ....

#### Part 2 Acknowledgement

I hereby acknowledge that the above Person in Charge can carry out the tasks or operations listed on this Standing Instruction, subject to compliance with MOD Safety Rules and Procedures.

Signed: ..... Operating Authority  
Name (print): ..... Time & Date: .....

In the employ of: ..... Contact Tel No: .....

#### Part 3 Acceptance

I accept receipt of this Standing Instruction. I have been shown the installation to which this Instruction refers and confirm that I fully understand the tasks listed above and the circumstances under which they are to be undertaken.

Signed: ..... Person in Charge  
Name (print): ..... Time & date .....

In the employ of: ..... Contact Tel No. ....

## PET 06 - Restricted Area Works/Tank Entry Checklist

This checklist is intended to be used as an aid. Consideration should be made to any relevant safety publications and MOD documents,

	<b>Any deviations from the task plan, work must be stopped, the fault/error rectified prior to recommencing work.</b>	<b>Yes</b>	<b>No</b>	<b>N/A</b>
1.	Has the scope of work been clearly specified?			
2.	Building or Area Manager / Operating Authority aware of the work.			
3.	Work period, permit validity to be agreed by all parties.			
4.	Area, operational or system activities reviewed, and operations agreed to cease during the work period.			
5.	Safety arrangements, emergency arrangements agreed. Establishment/site safety instructions reviewed, and any other authorities informed of the forthcoming planned works. First aid, emergency resuscitation, fire fighting equipment and Unit Spill Response Plan.			
6.	Arrangements in place for removal of product, including final tank bottoms.			
7.	Details of installation, tank/s, drawings, operating and maintenance instructions available.			
8.	Details of product handled, MSDS available. Fuel classification (0, I, II, III or unclassified), additives within fuel (toxicity). Leaded product history for tank available.			
9.	Cathodic protection to tank or pipework – ensure isolation applied in accordance with manufacturer's instructions.			
10.	AP risk assessment completed			
11.	Safety Programme completed. Isolations clearly defined.			
12.	Task risk assessment and method statement completed, by the contractor/s undertaking the work.			
13.	Working at Height authorisation required.			
14.	Named person to be appointed as person in charge submitted by the employing company, including all certification and stated as competent to carry out the task by the employing company. Petroleum/confined space training Medical Fire Training First Aid			
15.	Tank entry - Method of cleaning appropriate for the tank.			
16.	Tank entry - Removal of tank internals/equipment required.			
17.	Tank repairs - Cleaning fluids, applications and compounds used for tank lining repair – risk assessment, COSHH assessment carried out.			
18.	Actions required in case of emergency, telephone numbers and points of contact.			
19.	Isolations appropriate for the task, clearly specified on the above documents. This includes mechanical (valves/blanks/spades) and electrical isolations (pumps and heaters).			
20.	Tank entry - All persons undertaking tank entry, standby persons and supervisor – appropriate certification received, medicals and submitted as competent by the employing company.			
21.	Skilled Persons' appointment procedures completed. Safety rule books issued and signed for.			
22.	All tools and equipment to be used, listed and accompanied with appropriate certification as fit for use, including the following: - PPE. Clothing, footwear, non-static, including under garments.			

	<b>Any deviations from the task plan, work must be stopped, the fault/error rectified prior to recommencing work.</b>	<b>Yes</b>	<b>No</b>	<b>N/A</b>
	RPE. Face masks, hoses, cylinders, canisters. Compressor for breathing air, diesel and its fuel. Safety equipment, rescue harnesses, life-lines, tripod. Multiple gas indicators. Warning notices. Lighting equipment.			
23.	Site layout agreed access and egress routes. Clearly defined restricted areas wash down areas, dirty and clean clothing areas, and welfare facilities.			
24.	Wash down facilities, and welfare facilities correctly placed.			
25.	All cross-bonding/earthing in place and satisfactory.			
26.	Weather, wind direction considered.			
27.	Drains, sewers blanked. Interceptors fit for purpose.			
28.	Are users briefed on the permit-to-work, and have they acknowledged understanding of requirements.			
29.	Isolations correctly implemented.			
30.	Tank entry - Manhole entry and tank ventilation.			
31.	Are the right people aware of isolated equipment?			
32.	Ensure housekeeping and hygiene standards remain satisfactory.			
33.	Tank entry - Tank ventilation is always kept running when persons are in the tank.			
34.	Procedures in place for removing arisings/sludge.			
35.	Procedures in place for disposal of arising/sludge – waste transfer note(s) – copy to be placed on AP file.			
36.	Records kept on the use of RPE and PPE; e.g. breathing apparatus canisters.			
37.	Repair works, risk assessed, method statement.			
38.	Hot work, (welding, grinding) permission required.			
39.	Installation reinstatement. Process for reinstatement documented. All equipment (electrical and mechanical) to be reinstated and signed off as fit for continued use by a competent person.			

Comments:

Raised by:

Signature:

Date:

**PET 07 - RPE Assessment**

STEP 1						
Company			Department			
Date of Assessment			Section			
Assessment By			Location			
Works Details			Work duration			
			Work frequency			
STEP 2						
Control Measures				Reason for using RPE		
Confined space working				Residual Risk		
	Unsure	No	Yes			
Confined space						Short duration work
Risk of oxygen deficiency						Emergency escape
Substance release						Interim measure
				Emergency work/rescue		
Seek specialist advice	Go to step 3	Comply with Confined Spaces Regulation. Use only breathing apparatus with PF of 40, unless a higher PF is indicated in STEP 3				
STEP 3						
Substance	Risk phrase*	HHG*	Amount*	Dust/Vol*	PF*	
				<b>Highest PF required</b>		
STEP 4						
Task related factors						
	Work related Heavy, Medium, Light			Clarity of vision critical		
	Wear time >1hr, <1hr			Clarity of communication critical		
	Abnormal temperature or humidity			Congested work area		
	Power tool used, list below			Potentially explosive area		
				Mobility critical		
User Name						
Wearer related factors						
	Headgear (turban etc)			Spectacles or contact lenses worn		
	Facial hair			Eye, head, ear or facial protection		
	Facial marking			Medical condition, seek medical advice		

Selected RPE using this information and <b>PART 2</b> , or show this form to your supplier/specialist advisor. Involve the wearer and provide a choice of RPE	RPE selected	
	BA Type:	
	Respirator type:	Filter:
<b>Step 5</b>		
Fit test, tight fitting RPE and implement RPE use	Signature of assessor	