



SAFETY RULE BOOK

FOR PERSONS IN CHARGE OF WORK ON

MECHANICAL SYSTEMS

ASSOCIATED WITH JSP 375 VOLUME 3 CHAPTER 4



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FOR PERSONS IN CHARGE OF WORK ON

MECHANICAL SYSTEMS

A summary of the duties and responsibilities of Persons in Charge of work on Mechanical Systems, as taken from the MoD Health & Safety Handbook JSP375 Volume 3

Full details of JSP 375 Volume 3 Chapter 4 – Mechanical Systems can be found on the Defence Intranet at:

http://defenceintranets.diiweb.r.mil.uk/sites/polestar/cs/DocumentLibrary/02/32_jsp375_vol3_chap4.pdf

or on the World Wide Web at:

<http://www.mod.uk/NR/rdonlyres/CDCF6620-DD6D-45B7-875B-0B69F48EDAC7/0/JSP375Vol3Chap4.pdf>


SAFETY RULES AND PROCEDURES – MECHANICAL SAFETY RULE BOOK

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Rule Book issued to:	Name: Employed by:	
Address of Establishment		
Emergency Telephone Nos	On Site: Off Site:	
Maintenance Management Organisation (MMO) details	Address: Site Contact: AP Contact: Details: (Phone & Mobile)	
Additional Contacts		
4 Cs Co-ordinator	Name & Location: Phone No:	
Asbestos Register Custodian	Name & location: Phone No:	
Key Control System	Arrangements For issue of keys: Contact Names & Phone Nos:	
Site H&S Rules	Specific details or document references:	

Site Map



FOREWORD

SAFETY RULE BOOK

The Mechanical Safety Rule Book has been prepared for the benefit of all persons involved in working on or testing of Mechanical Systems for which the Ministry of Defence is responsible.

All persons issued with the Rule Book are to have it available for reference whenever they are working on or testing Mechanical Systems.

The Safety Rule Book is a brief summary of JSP 375 Volume 3 Chapter 4 Mechanical Systems. The JSP should be used as the key reference document.

Chapter 4 of JSP 375; Volume 3 was prepared under the patronage of the Ministry of Defence (MOD) Directorate of Defence Safety & Claims (DS&C) and is to be read in conjunction with the Common Requirements contained in Chapter 2. These Safety Rules & 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 etc Act and to aid the safe conduct of works activities.

The 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 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
- 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 Estates
Kingston Road
Sutton Coldfield
B75 7RL

Amendments to Chapter 4 will be advised by a Defence Information Notice or a Defence Estates Policy Instruction issued to MOD Top Level Budget Holders, DE 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.

The Safety Rules and Procedures have been devised for the use of the MOD and its contractors in the execution of contracts for the MOD. The MOD hereby excludes all liability (other than liability for death or personal injury) whatsoever and howsoever arising (including but without limitation, negligence on the part of the MOD, its servants or agents) for any loss or damage however caused where the Document is used for any other purpose.

Compliance with either Chapter 4, Chapter 2 (Common Requirements) or Chapter 8 (Tuition Training and Site Familiarity) does not of itself confer immunity from legal obligations.

1.0 INTRODUCTION

1.1 GENERAL

1.1.1 This Safety Rule Book is provided as guidance to Skilled Persons for work on 'Mechanical Systems'. For further information and detail reference should be made to JSP 375 Vol. 3.

1.1.2 In the case of conflict between this Safety Rule Book and Statutory Requirements or relevant Standards, the Skilled Person is to seek guidance from the AP.

1.2 SCOPE AND LIMITATIONS

1.2.1 The Mechanical Systems Safety Rules and Procedures are designed for use on MOD Establishments, both in the UK and overseas.

1.2.2 The Safety Rules and Procedures apply to the following Mechanical Systems:

- Any Pressure System containing a relevant fluid as defined by the Pressure Systems Safety Regulations (PSSR), these can include:
 - Steam
 - Pressurised and Hot Water systems
 - Compressed Air
 - Refrigeration
- Medical Gas Pipeline Systems (MGPS)
- Dental Air and Vacuum Systems (DAVS)
- Class III Boiler Fuels within the confines of the Boilerhouse, excluding 'hot work' and vessel entry
- LPG within the confines of a building after and including the LPG Isolation Valve
- Natural Gas within the confines of a building after and including the Gas Isolation Valve
- Hydraulic, Industrial Gas, LTHW systems and other Mechanical Systems as determined by the Authorising Engineer's Site Survey and Risk Assessment of the Systems where significant risk is identified

1.2.3 LPG cylinder and bulk storage (including distribution systems) is not within the scope of this Chapter and is to be managed in accordance with JSP 375 Volume 3 Ch. 5 – Petroleum.

1.2.4 Natural Gas Distribution Systems are excluded from this Chapter and are to be managed in accordance with JSP 375 Volume 3 Ch. 5 – Petroleum.

2.0 ROLES & DUTIES

2.1 AUTHORISED PERSON (MECHANICAL)

2.1.1 A key role of the AP is to oversee and certify the isolation of Mechanical Systems for which they have been appointed by the Authorising Engineer.

2.2 PERSON IN CHARGE (MECHANICAL)

2.2.1 The role of the Person in Charge (PiC) is to directly supervise (or carry out) work on a Mechanical System for which they are in receipt of a Permit to Work or directly carry out work on a Mechanical System for which he/she is in receipt of a Standing Instruction.

2.2.2 The PiC must be an appointed Skilled Person for the system for which the Permit to Work or Standing Instruction is to be issued.

2.2.3 Duties of PiC for work on Mechanical Systems include:

- Ensuring that adequate emergency arrangements are in place before starting work
- Ensuring that the contents of the Risk Assessment for the task are communicated to all members of the work team
- Ensuring that all necessary safety equipment is available and suitable for use prior to work
- Ensuring that all members of the work team are adequately trained, fit and able to carry out the work required
- Understanding and complying with the conditions set out in the Permit to Work and agreed Safety Programme and Statement of Isolation
- 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 the Safety Rules and Procedures
- Ensuring that the only work carried out is that for which the Permit to Work or Standing Instruction is valid
- Stopping work and withdrawal of all personnel, tools, plant and equipment if for any reason the conditions of the Safety Programme and Statement of Isolation or Permit to Work or Standing Instruction cannot be met
- Reporting to the AP any accident, dangerous occurrence, defects found or other exceptional incidents occurring during work under the Permit to Work or Standing Instruction
- Always being present at the work site when any work is being carried out

2.3 SKILLED PERSON (MECHANICAL)

2.3.1 Duties of the Skilled Person include:

- Working in accordance with the Safety Rules and Procedures
- Taking reasonable care of the health and safety of themselves and of any other person who may be affected by their actions or omissions
- Only using equipment for which they have been trained and in the manner in which they have been trained
- Reporting to the Person in Charge any defects found in the tools, plant and equipment to be used in the works

2.3.2 A Skilled Person must only work on Mechanical Systems for which he/she has been appointed.

3.0 MANAGEMENT ARRANGEMENTS

3.1 KEYS & KEY SECURITY

Safety Locks, Safety Keys & Safety Key Boxes

3.1.1 Safety Keys are keys to Safety Locks. These are used to:

- lock isolation valves in the open or closed position as appropriate
- isolate fuel and electricity supplies
- lock by-pass valves in safe positions
- lock open drainage points and vents

3.1.2 A Safety Lock is a padlock indelibly painted red having only one unique key. When the safety locks are in use under a Safety Programme and Statement of Isolation the safety keys are to be kept in a Safety Key Box.

Access Keys

3.1.3 Access Keys are keys to locks that control access to Boilerhouses and Plantrooms that contain Mechanical Systems.

3.2 CO-ORDINATION OF ACTIVITIES ACROSS THE SITE

3.2.1 Where work involves APs from different disciplines, one AP is will co-ordinate the actions of the APs of all other disciplines.

4.0 OPERATIONAL PROCEDURES

4.1 RISK ASSESSMENT

4.1.1 Prior to any work on a Mechanical System a 'suitable and sufficient' Risk Assessment must be produced.

ISOLATION RISK ASSESSMENT

4.1.2 This Risk Assessment is produced by the AP to address the hazards exhibited by the system.

4.1.3 The Isolation Risk Assessment must be prepared in conjunction with the Safety Programme and Statement of Isolation to confirm the isolation methodology to be adopted. This Risk Assessment **must** also include the hazards to the individual carrying out the isolation.

TASK RISK ASSESSMENT

4.1.4 This further Risk Assessment is required to cover the risks encountered in carrying out the task. This 'Task Risk Assessment' is to be followed by the person(s) carrying out the task and is to include local hazard information.

4.1.5 The Task Risk Assessment is to be submitted to the AP **prior** to the issue of a Permit to Work/Standing Instruction. There must be a reasonable timeframe (to be agreed with the AP/Skilled Person) prior to the requirement for a Permit to Work to enable the AP sufficient time to review the Task Risk Assessment.

4.1.6 If the Task Risk Assessment is inadequate the AP will not issue a Permit to Work/Standing Instruction.

4.2 ISOLATION

4.2.1 As stated in Para 4.1.3, the method of isolation will be in accordance with JSP375 Volume 3 Chapter 4 Para 5.4.

4.2.2 ELECTRICAL ISOLATION

4.2.2.1 Electrical isolation for the purpose of mechanical maintenance may be made without reference to the AP (Electrical) when:

- a, the isolation is via a switch or circuit breaker, and
- b, the switch or circuit breaker can be locked in the 'off' position by use of a safety lock

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)

4.2.3 FUEL OIL ISOLATION

4.2.3.1 Work on Class III Fuel Installations within the confines of a boilerhouse or plantroom can be authorised by the AP. Work on Fuel Oil installations outside the confines of the Boilerhouse or works involving hot work is to be managed in accordance with JSP 375 Volume 3 Chapter 5 – Petroleum.

4.2.4 NATURAL GAS / LPG

4.2.4.1 The re-instatement of Natural Gas or LPG whether isolated or disconnected must be undertaken by a member of a class of persons approved by HSE (currently Corgi) fitter and carried out in accordance with the current gas safety regulations.

4.2.4.2 Where any part of the system has been physically disconnected, a gas soundness certificate must be issued prior to restarting the system.

4.3 SAFETY PROGRAMME AND STATEMENT OF ISOLATION

4.3.1 The sequence of events involved in raising and implementing a Safety Programme and Statement of Isolation is shown in the accompanying flow charts.

4.3.2 **Points to Note:**

4.3.3 Once the Safety Programme and Statement of Isolation is completed the system or part of the system is deemed to be safe to work on.

4.3.4 The Safety Programme and Statement of Isolation cannot be closed until all Permits to Work raised against it are complete and the system has been visually inspected for integrity by the AP.

4.3.5 Where 2 Stage Isolation is being applied, a minimum of 2 people including the AP must be present. This will be detailed within the Isolation Risk Assessment and may include additional precautions in addition to the requirement for countersignature by a second AP or the AE.

4.3.6 The nature of the task/tasks to be implemented will determine if the keys are to be locked in a standard Safety Key Box or a Safety Key Box which has the facility to fit a multi-hasps. The AP will retain and secure the AP Key from the Safety Key Box.

4.4 PERMIT TO WORK (REQUIREMENTS)

4.4.1 A Permit To Work is required where the integrity of a system is to be breached and when either:

- the system is classified as high risk or
- the system is classified as low risk and the Approved or Acceptable Method of isolation is not achievable (see JSP375 Volume 3 Chapter 4 Para 5.4).

4.4.2 A Permit to Work is not required for routine operational tasks not involving the use of tools (Water treatment, draining receivers)

4.4.3 Work on Low Risk Systems where a PTW is not required will be controlled by the use of a Standing Instruction.

4.4.4 The AP will issue the PTW to the Skilled Person immediately before work is to commence and it is to remain in force until the work is completed.

4.4.5 Whilst a PTW is in force a sign will be displayed at the point of work clearly identifying that a Permit to Work is in force and giving contact details of the Duty Authorised Person.

4.5 ISSUE, ACCEPTANCE AND CANCELLATION OF PERMITS TO WORK

4.5.1 The sequence of events involved in the issuing and acceptance of a Permit to Work (PTW) is shown on the accompanying flow charts.

4.5.2 **Points to Note:**

4.5.3 A Permit to Work will be issued only at the point of work.

4.5.4 Before the issue of a PTW, the Duty AP will demonstrate to the Skilled Person:

- the identity of the Mechanical System and the component parts to be worked on
- that the Mechanical System or component part has been isolated
- the safety arrangements at the place of work and at points of isolation
- any special instructions and/or safety measures
- that the point(s) of work is/are de-pressurised, vented and drained, and that it is safe for the work to proceed

4.5.5 Before the issue of a PTW the Duty AP will also ensure that the Skilled Person is in possession of and understands the Task Risk Assessment and the Method Statement for the task.

4.5.6 Before accepting the PTW the Skilled Person is to:

- read the PTW and the Safety Programme and Statement of Isolation
- understand the extent of the work
- understand the safety precautions
- be prepared to undertake the work
- enter the PTW number and sign the Safety Programme and Statement of Isolation

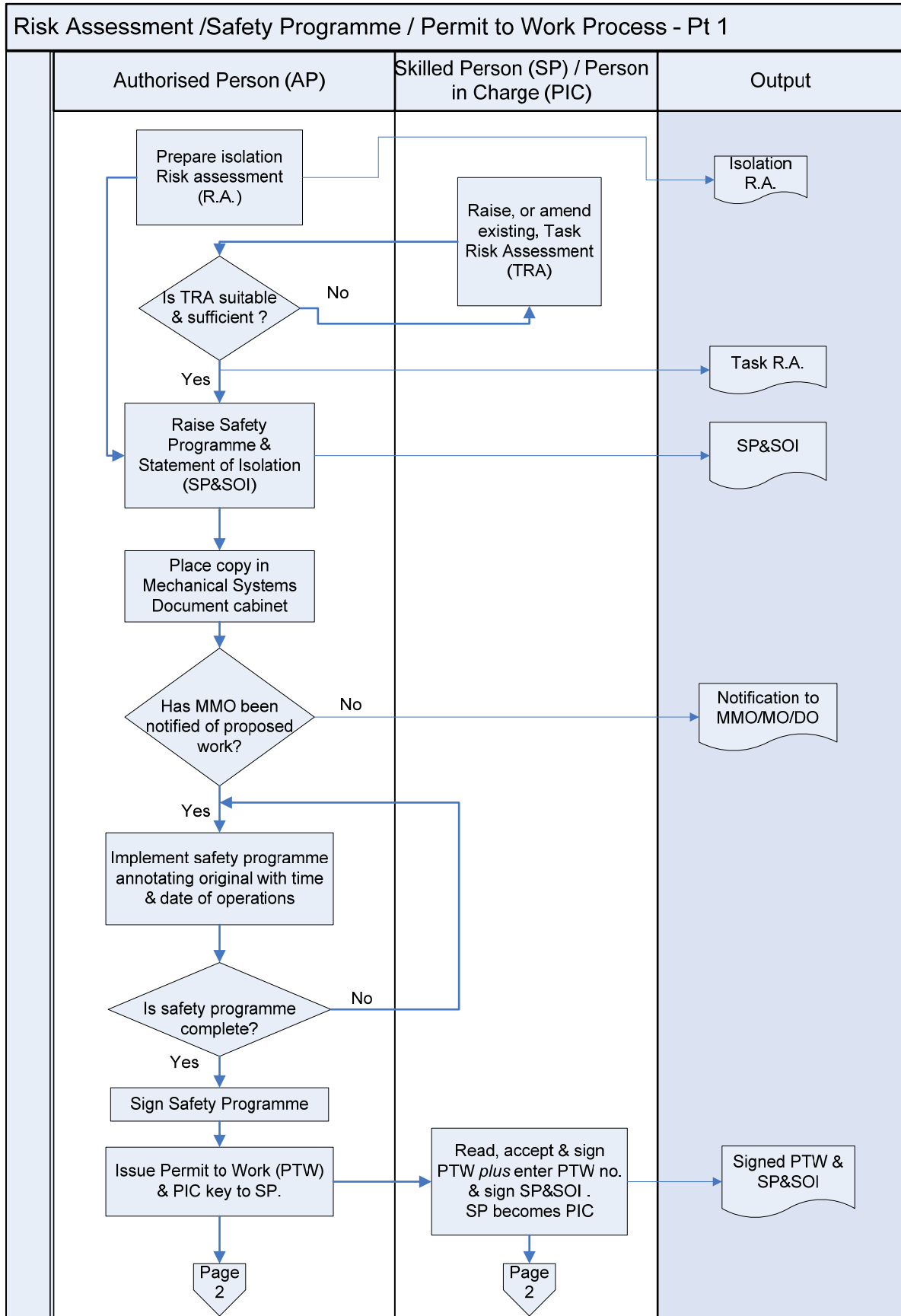
4.5.7 The Skilled Person is to sign the relevant Section of the PTW to accept the responsibilities of the Person in Charge (PIC). On signing for acceptance of the PTW the Skilled Person authenticates the permit as valid and becomes the PIC of the permitted work.

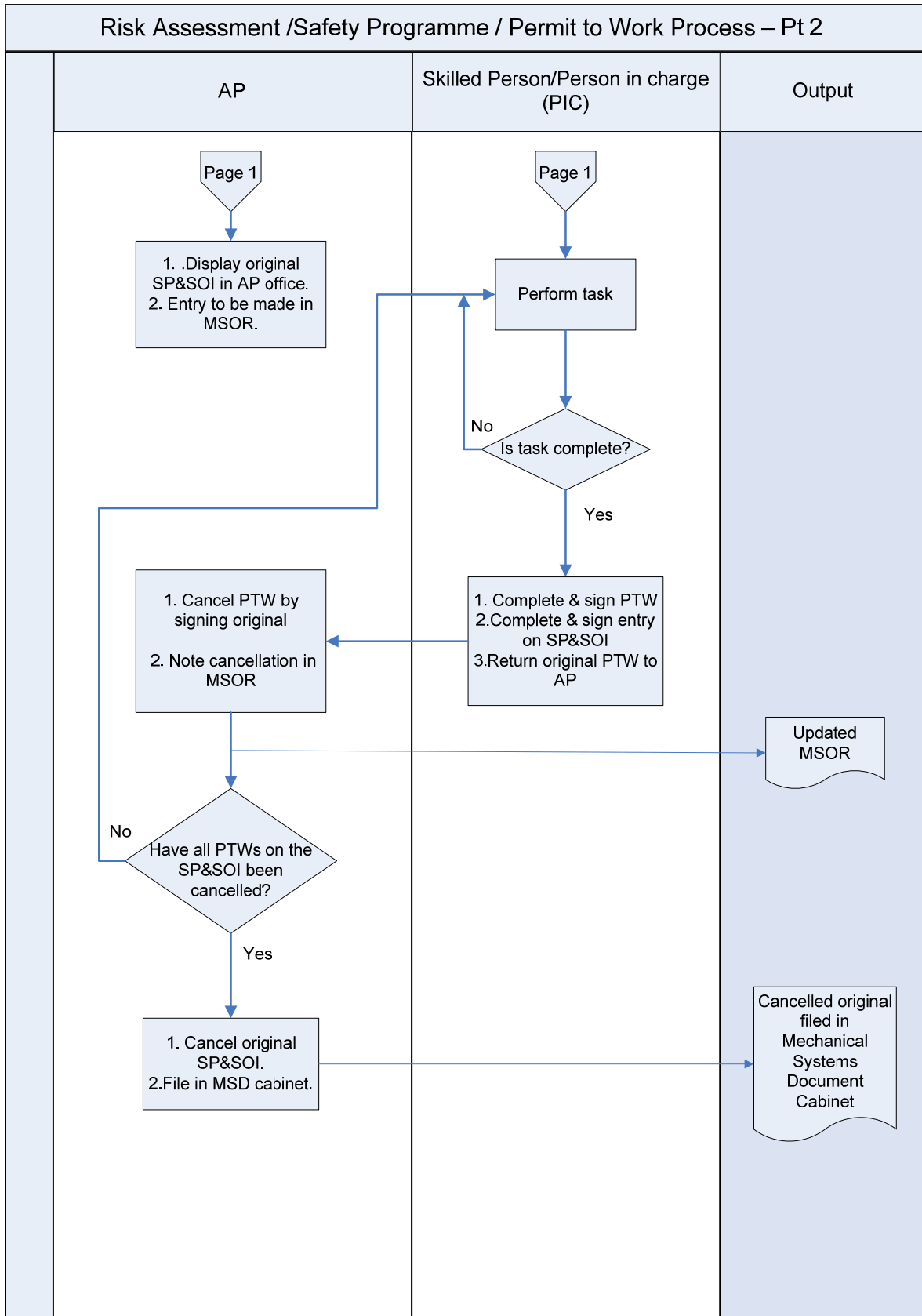
4.5.8 The PIC is then to either take control of the PIC Key from the Safety Key Box, or is to attach a unique padlock to the multi-hasps on the Safety Key Box and take control of the key to that padlock.

- 4.5.9 The acceptance of a PTW identifies the PiC as personally responsible for supervising or undertaking the defined work. The PIC retains the original Permit to Work until the task is completed or stopped.
- 4.5.10 While the work is in progress, the PIC is not permitted to leave the site or to undertake any other work or tests. During any temporary absence of the PIC from the point of work the 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.
- 4.5.11 Where a change of PIC is required the PTW is to be closed and a new PTW issued. The reason for closure of the PTW and status of the task is to be recorded on the original PTW and in the MSOR.
- 4.5.12 On completion of the work the PIC is to:
- withdraw all persons, equipment, tools and instruments from the point of work
 - advise all persons under his or her control that they are no longer permitted to work on the mechanical system
 - complete and sign the relevant Section of the original PTW
 - complete and sign the entry on the Safety Programme and Statement of Isolation
 - return the original PTW to the duty AP
 - return the PIC Key or remove the unique padlock from the multi-hasps
- 4.5.13 The Duty AP will confirm that the work has been completed satisfactorily and close the PTW.
- 4.5.14 If the Duty AP decides that it is necessary to stop the work, the PTW will be withdrawn and cancelled. A new PTW is required before re-starting work.
- 4.5.15 Where the work is stopped, the PTW will be cancelled. The PIC is to:
- withdraw all persons and if appropriate all equipment, tools and instruments from the place of work
 - advise all persons under his or her control that they are no longer permitted to work on the system
 - amend the relevant section of the original Permit to the effect that the work is incomplete and the point of work has been made safe
 - return the original PTW to the duty AP
 - return the PIC Key or remove the unique padlock from the multi-hasps
- 4.5.16 Where the work is stopped and the PIC has returned the PTW, the AP will annotate the Safety Programme and Statement of Isolation to highlight that work is not complete. This serves to prevent removal of the isolations until all associated work is complete and the integrity of the system has been restored.
- 4.5.17 If the PiC has lost the original PTW, the loss is to be recorded by the Duty AP in the MSOR. The photocopy or carbon duplicate from a pad 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 MSOR to confirm and acknowledge the loss of the PTW.

4.6 REINSTATEMENT ON COMPLETION OF WORK/INSPECTION

- 4.6.1 The isolation risk assessment will identify the risks associated with the reinstatement of the system on completion of work/inspection. Where the risk of reinstatement is identified as high, a documented reinstatement programme will be produced and implemented under the supervision of the AP..
- 4.6.2 A reinstatement programme is required to be produced for all works involving a two stage isolation.





4.7 **STANDING INSTRUCTIONS**

4.7.1 Standing Instructions are issued by the Duty AP to Skilled Persons for both one-off and repetitive tasks on mechanical systems where a PTW is not appropriate.

4.7.2 A Standing Instruction will contain:

- Location and type of system to which the instruction refers
- Isolation procedure (if applicable)
- Detail of tasks to be carried out
- Special instructions or safety measures applicable
- Name of Skilled Person
- Employer
- Validity period of Standing Instruction

4.7.3 Standing Instructions will detail the procedure to be undertaken by the Skilled Person to ensure that the system is safe to work on. This may be in the form of an attached procedure detailing the method for isolation and de-pressurisation. There could be several such procedures supporting a Standing Instruction as it may cover more than one item or plant system.

4.7.4 Standing Instructions will be supported by Risk Assessments that cover both the isolation procedure and the task.

4.7.5 Standing Instructions (Electrical) issued by the Authorised Person (Electrical) for electrical work such as fault finding in a boiler house control panel are outside the scope of the Safety Rules and Procedures.

4.8 **ISSUE, ACCEPTANCE AND CANCELLATION OF STANDING INSTRUCTIONS**

4.8.1 The sequence of events involved in the issuing and acceptance of a Standing Instruction is shown on the accompanying flow chart.

4.8.2 **Points to Note:**

4.8.3 Having understood the instruction(s) and being prepared to undertake the task(s), the Skilled Person is to sign and accept the Standing Instruction. On signing for acceptance of the instruction a Skilled Person authenticates the instruction as valid and becomes the Person in Charge of the permitted task(s).

4.8.4 In accordance with local or other MOD procedures the AP will ensure that, where appropriate:

- Persons in Charge inform the Maintenance Management Organisation (MMO) of any task to be undertaken which may result in any loss of service
- Persons in Charge obtain permission from the MMO before taking mechanical systems out of service
- Skilled Persons are provided with a written instruction of the arrangements for informing the MMO of any loss of service.

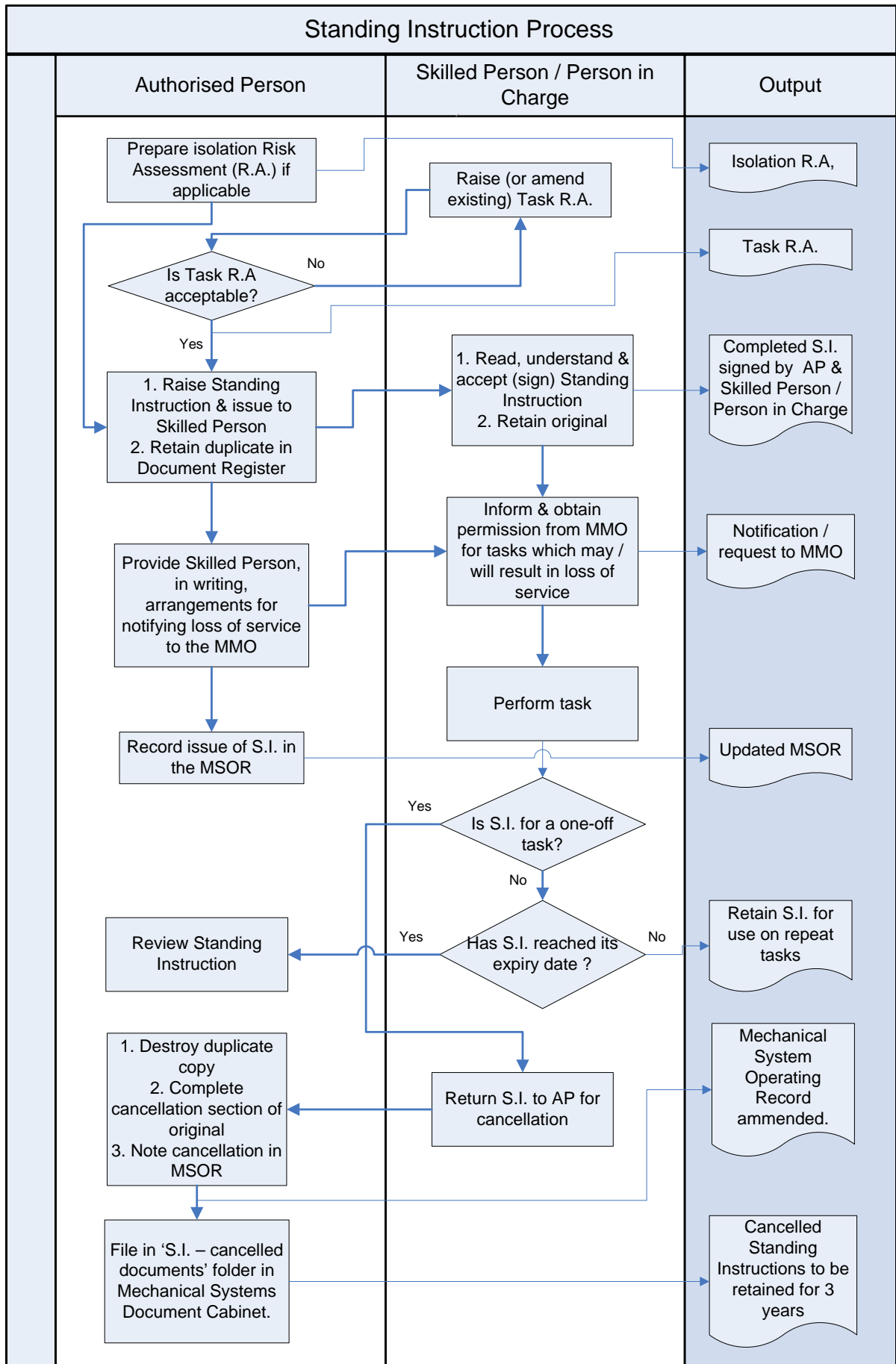
4.8.5 The Duty AP may cancel a Standing Instruction at any time.

4.8.6 On completion of the tasks outlined in the Standing Instruction or (for repetitive tasks) on reaching the expiry date, the Person in Charge is to return the instruction to the duty AP for cancellation. All Standing Instructions for repetitive tasks will include an expiry date.

4.8.7 If the Person in Charge has lost the original Standing Instruction, the loss is to be recorded by the AP in the MSOR. The duplicate copy of the Standing Instruction is then to be used in place of the original and cancelled in accordance with the previous paragraphs. The Person

in Charge is to countersign the statements in the MSOR to confirm and acknowledge the loss of the Standing Instruction.

- 4.8.8 A Standing Instruction cannot be transferred from one Skilled Person to another.
- 4.8.9 A Standing Instruction for repetitive tasks is to be valid for not more than three years but must be reviewed by an AP at intervals of not more than twelve months or following any change or modification to the system. Before issuing a new Standing Instruction the AP is to review the tasks on the expired instruction.



5.0 TRAINING

5.1 SKILLED PERSONS

5.1.1 To be eligible for appointment, prospective Skilled Persons are to meet the requirements of JSP 375 Volume 3 Chapters 2 & 8 and are to have an appropriate qualification in a relevant discipline. Skilled Persons are required to have successfully undertaken technical training as determined by the AP to meet the needs of the site and the task.

5.1.2 The suitability of a specific qualification will depend on:

- the work to be undertaken
- the type of mechanical system

5.2 Specific Requirements for Work on Natural Gas and LPG

5.2.1 Any individual working on Natural Gas and/or LPG must also have successfully undertaken technical and practical training and assessment to enable them to be a member of a class of persons approved by HSE, their registration must be applicable to the type of work and responsibilities found on the particular establishment(s).

5.2.2 They must hold a valid identity card as a member of a class of persons approved by HSE (currently Corgi) with the relevant areas either endorsed on the rear of identity card or contained in a relevant certificate of competence from a Nationally Accredited Certification Body. See also Annex C

5.3 Specific Requirements for Work on MGPS & DAVS

5.3.1 In addition to the general requirements for Skilled Persons, those working on Medical Gas Pipelines and Dental Gas Systems (where not directly employed by the MMO) must also be employed by a company registered to BS EN ISO 9000 with the scope of registration defined to include design, installation, commissioning and maintenance of MGPS as appropriate (DAVS is deemed to be included in the MGPS registration).

5.3.2 Organisations installing or maintaining DAVS must be able to verify competence in appropriate techniques including supervision by qualified managers. Skilled Persons must be able to demonstrate that they are fully familiar with HTM 02 and with HTM 2022 Supplement 1. The Skilled Person must be qualified for the duties of the Competent Person as defined in HTM 02 Operational Management. The service provider must provide documentary evidence to this effect and evidence of the Skilled Person's training and re-training.

5.3.3 HTM 02 Part B Chapter 10 details procedures and rules for the competency of skilled persons. The Authorised Person has final authority in determining Skilled Person and contractor competency.

5.4 Specific Requirements for Work on Refrigeration Systems

5.4.1 To be eligible for appointment for work undertaken in association with Refrigeration Systems, prospective Skilled Persons are to meet the requirements of JSP 375 Vol.3 Ch. 2 & 8 and be competent and trained in the use and handling of refrigerants. Appropriate registration on the ACRIB Register of Operatives is required.

ANNEX A

BOILERS

A1 Introduction

- A1.1 The operation, maintenance and repair of these systems present hazards, the principal hazards being the potential uncontrolled release of stored energy in the form of a pressurised fluid and the potential to harm from contact with the heated fluid or heated surfaces. There are also other safety and environmental hazards to be considered including isolation of electricity and fuel supplies and evaluation of site conditions.
- A1.2 The pressure system isolation methods and proving techniques employed are based on the risk exhibited by the system. Selection criteria, methods of isolation and further guidance are described in JSP 375 Volume 3 Chapter 4 Mechanical Systems, Section 5, Operational Procedures.
- A1.3 In addition to the safe isolation and management procedures described in these Safety Rules and Procedures (JSP 375 Volume 3 Chapter 4 Mechanical Systems), it is necessary to provide operating and maintenance instructions that afford a safe environment.
- A1.4 With boiler installations there are many variations such as design concept, layout, control logic, which make the start-up methods, operating procedures, emergency action and maintenance routines all by definition slightly different.
- A1.5 **Skilled Persons must be familiar with the operating instructions and emergency procedures for the plant and equipment they are to work on.**

A2 EMERGENCY PROCEDURES

GENERAL

- A2.1 Report immediately, any accident or incident.

IN CASE OF FIRE

- A2.2 Raise the alarm in accordance with local arrangements for the building or site and then take action as follows, if safe to do so:
- isolate electricity supply
 - operate the emergency shut-off to the main fuel system fire valve where fitted

FAILURE OF ELECTRICITY SUPPLY

- A2.3 Where boiler houses have a second source of electricity, the following actions should be taken where applicable:
- initiate changeover sequence if manually operated
 - reset and start water circulating pumps
 - reset burner/stoker and fire boiler.
- A2.4 Where applicable:
- illuminate water gauge glasses, temperature, pressure gauges and other relevant controls with battery-operated lamps or torches
 - if necessary to avoid boiler water loss to the steam distribution system CLOSE the most convenient isolating valves and dampen down or withdraw fires
 - aid water circulation by opening all standby circulating pump valves

- observe the water level in the pressurisation unit and adjust the nitrogen pressure as a precaution against drawing nitrogen into the system and to avoid the generation of flash steam.

A2.5 On reinstatement of the electricity supply, restore the system to normal conditions and re-start boilers and associated equipment.

A3 Training

A3.1 All Skilled Persons are to have received suitable and sufficient training in order to demonstrate their competence for monitoring and maintaining heating, hot water and steam boiler systems to the satisfaction of the APs

ANNEX B

COMPRESSED AIR

B1 Introduction

- B1.1 Compressed air is a relevant fluid as defined by the Pressure System Safety Regulations. As air is compressible, it can contain a large amount of stored energy for a given volume and this characteristic can present a danger to those who operate or maintain compressed air systems.
- B1.2 The Health and Safety Executive produce a guidance booklet (HSG 39 Compressed Air Safety) which is essential reading for those operating and maintaining compressed air, plant and systems.
- B1.3 BS 6244 (Code of Practice for Stationary Air Compressors) provides further guidance on compressed air safety.
- B1.4 The Skilled Persons maintaining the compressed air system must have appropriate competence for the tasks they are required to carry out.
- B1.5 Installation and plant deficiencies must be recorded and brought to the attention of the Authorised Persons (APs).
- B1.6 Unsafe working by the users of the compressed air system is to be brought to the attention of the APs.

B2 Control of Works

- B2.1 Where there are small, single, compressor/receiver units, operating at or less than 10 barg. as typical of installations found in motor transport facilities, it is acceptable for the appropriately experienced and qualified Skilled Person to carry out maintenance tasks, including those that breach the integrity of the compressed air system. Such maintenance tasks are to be detailed on a Standing Instruction prepared and issued by an AP, in accordance with JSP 375 Volume 3 Chapter 4.
- B2.2 Work on compressed air systems:
- which comprise more than one receiver; and/or
 - which operate at > 10 barg; and/or
 - for which the risk assessment requires further controls
 - are to be controlled through a permit to work, in accordance with JSP 375 Volume 3 Chapter 4.

B3 Plant and Equipment Safety

Identification

- B3.1 For safety reasons, compressed air pipelines must be identified by a colour code in accordance with BS1710 (Specification for Identification of Pipelines and Services). Automatically controlled plant must have signs warning that the plant may start automatically and such signs must comply with the Health and Safety (Safety Signs and Signals) Regulations.

Air Intake and Plant Room Ventilation

- B3.2 Inlet air to compressors should be drawn from an area, which is free from potentially flammable or corrosive concentrations of fumes or vapours, or from moisture-laden air. Adequate ventilation must be provided in the plant room in which the air compressor plant is

sited and must take into account the heat generated from the compression process, as well as the risks to the system from low ambient temperatures.

Appropriate internal and external signage must be fixed adjacent to the air intakes. Compressors should preferably be sited outside boiler houses. Where this not so, the air inlet to the compressor plant should be ducted from an external source.

Operating Instructions

B3.3 All compressed air systems, plant and accessories are to have comprehensive, operating instructions. A copy of these instructions should be readily available to all Skilled Persons responsible for the maintenance of the compressed air plant.

B3.4 The Skilled Persons must be familiar with the emergency procedures for:

- any failure that results in the uncontrolled release of compressed air;
- over-pressurisation; and
- any other occurrence likely to cause danger.

Maintenance Tasks

B3.5 Maintenance is to be carried out in accordance with the manufacturer's instructions and MOD guidelines. General requirements for maintenance are set out in the Health and Safety at Work Act (Section 2(2) (a)) and the Provision and Use of Work Equipment Regulations. Guidance on the inspection and maintenance of compressed air systems is also provided in HSG 39.

B3.6 The discharge from a compressor may deposit oily residues in the exhaust chamber, the discharge pipe and the receiver. The oily residues can build up and if exposed to high temperatures, may ignite. This will result in fire in the compressed air pipe work.

Subject to a risk assessment, it may be necessary for the compressor head and discharge pipes to be removed and cleaned internally at least once per year.

The risk assessment could also require an over-temperature device to be installed in the compressor discharge to switch off the plant in the event of high temperatures.

B4 Training

B4.1 All Skilled Persons are to have received suitable and sufficient training to ensure their competence for monitoring and maintaining the compressed air systems to the satisfaction of the APs.

B4.2 Records of the Skilled Persons' appropriate engineering training and the associated experience are to be available to the APs.

ANNEX C

NATURAL GAS/LPG

C1 Introduction

C1.1 This section concerns how work on Natural Gas or LPG is to be carried out and controlled. It only covers installations located within buildings and does not cover the main storage/distribution system which falls under the remit of the AP/AE Petroleum.

C2 Control of Work

C2.1 The only persons allowed to work gas installations are those who are registered with the approved body for the class of work required. No work on any installation is to be carried out without prior consultation and approval from the MMO.

C3 Plant and Equipment Safety.

C3.1 Gas System Layout Drawings

(Sketches/Simple layout drawings of the site/premises gas system showing location of the Emergency Gas Control Valves, Isolation Valves etc are to be inserted into this section)

C3.2 Gas Escapes

Gas escapes are to be dealt with immediately they are identified and are to take priority over all other work.

C3.2.1 Initial Action

Where there is a danger to life the advice should be for people to vacate the premises/area around the leak.

Contact the Responsible Person (Gas) *(Insert details of contact eg Help Desk, AP)* by the quickest means possible to summon help.

Where there is no danger to life and/or the area/premise has been cleared the following actions are to be taken.

- Turn off the gas at the Emergency Control/Cylinder Valve
- Extinguish all sources of ignition
- Ventilate the building by opening all doors and windows within the property
- Ensure no one smokes
- Ensure no one operates any electrical equipment
- Ensure no one operates any electrical light or power switches (on or off)
- Ensure the premises can be easily accessed

C3.2.2 Action By Approved Gas Fitter

Take action to make the system safe as detailed above and test the installation for gas tightness.

Note: Where the approved gas fitter is advised of a smell of gas or detects a gas escape, no leakage tolerance is permitted.

Contact the Responsible Person (Gas) *(Insert details of contact eg Help Desk, AP)* by the quickest means possible to summon help. Obtain authority to locate and repair the leak.

Note: Where permission is NOT given by the MMO for action to be taken to re-instate the installation, complete all relevant documentation, listing any faults found and obtain a signature from the MMO.

C3.3 Unsafe Situations

Unsafe situations are to be dealt with in accordance with the attached flowchart.

C3.4 Safety Precautions

- C3.4.1 Any gas appliance, installation pipe work, flue or fitting installed at any place of work is to be maintained in a safe condition so as to prevent risk of injury
- C3.4.2 No person shall carry out any work in relation to gas in such a manner that gas could be released, unless steps are taken to prevent the gas so released constituting a danger
- C3.4.3 No person carrying out work in relation to gas equipment shall leave the undertaking unattended unless every incomplete gas-way has been sealed with the appropriate fitting or the gas equipment is otherwise safe.
- C3.4.4 When carrying out work in relation to gas equipment which involves exposing gas ways which contain or have contained flammable gas the Skilled Person shall not smoke or use any source of ignition in such a manner as may lead to the risk of fire or explosion
- C3.4.5 No person searching for an escape of gas shall use any source of ignition
- C3.4.6 Where a person carries out any work in relation to gas equipment which might affect the gas tightness of the installation they shall immediately thereafter test the installation for tightness at least as far as the nearest valves upstream and downstream of the works
- C3.4.7 No person shall install a gas storage vessel unless the site where it is to be installed is such as to ensure that it can be used, filled or refilled without causing danger

C3.5 Protection against Damage

- C3.5.1 Gas equipment is to be installed or replaced in accordance with appropriate standards and the manufacturer's instructions. The Gas Appliances (Safety) Regulations 1995 require such instructions to accompany appliances. Where the appliance is installed in domestic premises these instructions are to be left at the premises and a copy passed to the Responsible Person (Gas). Where the appliance is installed in non-domestic premises these are to be passed to the Authorised Person.
- C3.5.2 Gas equipment is not to be installed or replaced if there is reason to suspect that foreign matter may block or otherwise interfere with the safe operation of the fitting unless a suitable filter or other protective device is fitted.
- C3.5.3 Gas equipment is not to be installed or be replaced in a position where it is likely to be exposed to any substance which may corrode the equipment, unless it is constructed of materials which are inherently resistant to corrosion, or it is suitably protected against such corrosion.

C3.6 Existing Gas Equipment

- C3..1 No person shall make any alteration to any premises or site in which a gas storage vessel is fitted if that alteration would adversely affect the safety of the fitting or vessel such that, if the fitting or the vessel had been installed after the alteration, there would have been a contravention of or failure to comply with the Regulations
- C3..2 No person shall do anything which would affect a gas fitting or any flue or means of ventilation used in connection with the fitting in such a manner that the subsequent use of the fitting might constitute a danger to any person

C3.7 Installation of Gas Appliances

- C3.7.1 No person shall install a gas appliance unless:

- the appliance and the gas fittings and other works for the supply of gas to be used in connection with the appliance is safe
- there is a means of removal of the products of combustion from the appliance
- there is a sufficient permanent supply of air for the appliance for proper combustion
- there is a means of ventilation to the room or internal space in which the appliance is to be used, and
- the general conditions of installation including the stability of the appliance and its connection to any other gas fitting is correct

C3.8 Servicing Gas Appliances

C3.8.1 Where an Approved Gas Fitter services a gas appliance, the Employer is to ensure that the Approved Gas Fitter has immediately thereafter examined:

- the effectiveness of any flue
- the supply of combustion air
- its heat input and operating pressure
- its safe functioning

C3.8.2 Where a defect is found during the course of the activity the Approved Gas Fitter is to immediately notify the responsible person for the premises where the appliance is situated and in turn his/her Employer and Responsible Person (Gas).

C4.9 Flues

C4.9.1 No person shall install a gas appliance to any flue unless the flue is suitably constructed and in a proper condition for the safe operation of the appliance, and that no person shall:

- install a flue pipe so that it enters a brick or masonry chimney in such a way that the seal between the flue pipe and the chimney cannot be inspected
- connect a gas appliance to a flue which is surrounded by an enclosure unless that enclosure is so sealed that any spillage or products of combustion cannot pass from the enclosure into any room or internal space in which the appliance is installed
- install a power operated flue system for gas appliance unless it safely prevents the operation of the appliance if the draught fails

C4.10 Flue Dampers

C4.10.1 Any person who installs an automatic damper to serve a gas appliance shall:

- ensure that the damper is so interlocked with the gas supply to the burner, that burner operation is prevented in the event of failure of the damper when not in the open position
- immediately after installation examine the appliance and the damper to verify that they can be used together safely without constituting a danger to any person or property
- Manually operated dampers to flues are not to be installed to serve any gas appliance unless the damper is permanently fixed in the open position.

C4.11 Suspended Appliances

C4.11.1 A suspended gas appliance is not to be installed unless adequately supported in accordance with the appliance manufacturer's installation instructions.

C4.12 Test and Inspection

C4.12.1 Completion and/or test certificates are mandatory.

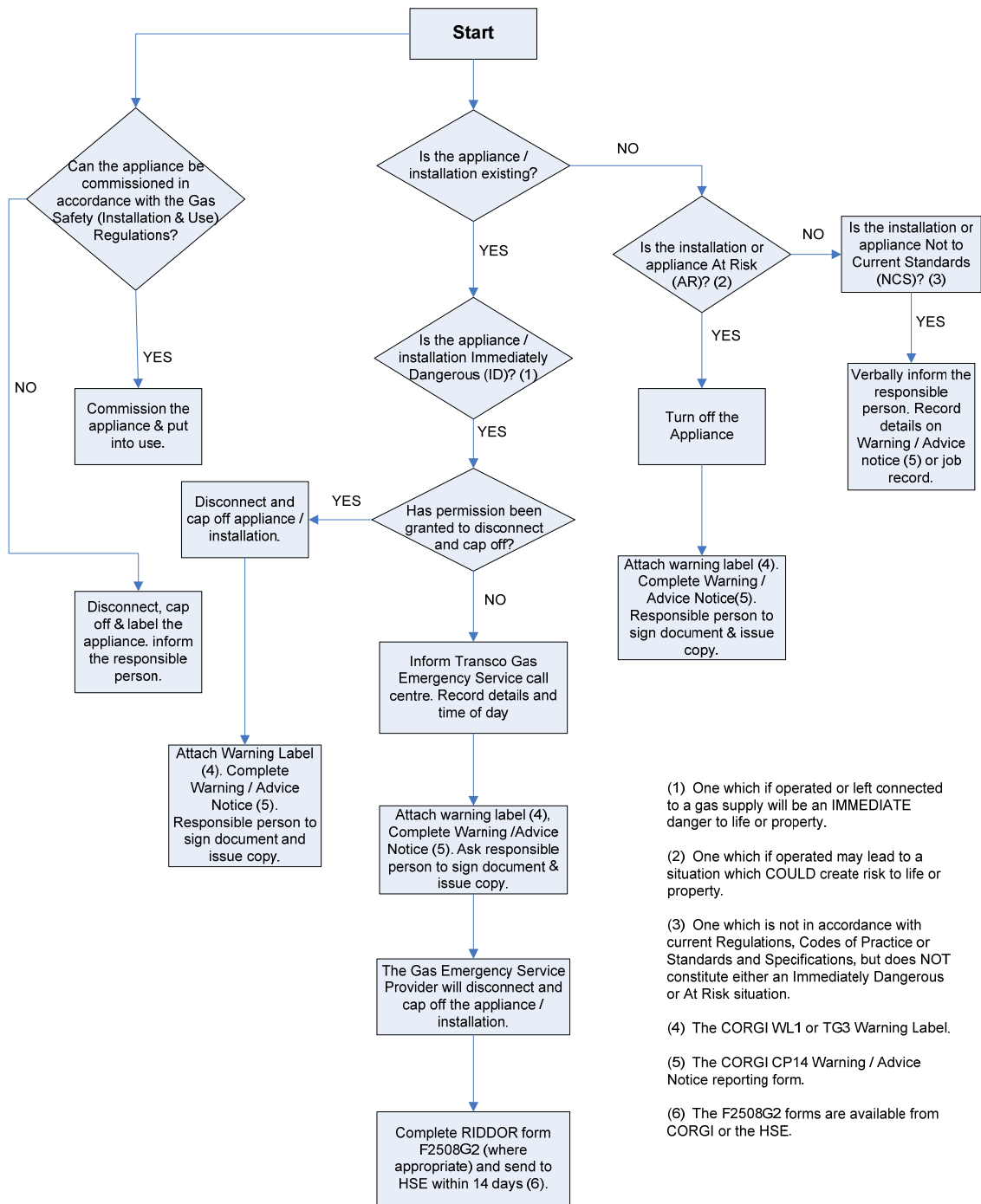
C4.12.2 The following lists the documents most common to the MMO's activities and are to be processed when applicable, copies of which are to be issued to the Authorised Person:

- Gas Safety Inspection
- Landlord's Gas Safety Record
- Electrical Cross Bonding
- Combustion Report Form
- Warning/Advice Notice

C4.13 Dangerous Occurrence

- C4.13.1 The Approved Gas Fitter is to notify his/her Employer and the Responsible Person (Gas) immediately of any dangerous occurrence or near miss.

Dealing with Unsafe Situations



(1) One which if operated or left connected to a gas supply will be an IMMEDIATE danger to life or property.

(2) One which if operated may lead to a situation which COULD create risk to life or property.

(3) One which is not in accordance with current Regulations, Codes of Practice or Standards and Specifications, but does NOT constitute either an Immediately Dangerous or At Risk situation.

(4) The CORGI WL1 or TG3 Warning Label.

(5) The CORGI CP14 Warning / Advice Notice reporting form.

(6) The F2508G2 forms are available from CORGI or the HSE.

ANNEX D

INDUSTRIAL GASES

(Information regarding compressed gases can be found in JSP 319. Copies of safety data sheets etc can be found on the BOC Web site

http://www.bocindustrial.co.uk/bocindustrial/safety/gas_safety/index.asp. For other specific information see the British Compressed Gases Association website.)

D1 Introduction

D1.1 This section deals with all compressed industrial gases (excluding LPG) found across the Defence Estate. As the types and storage/transportation of compressed industrial gases varies widely across Defence Estates, the guidance in this section therefore only relates to the particular site the Skilled Person is working on.

D2 Control of Work

(This section is to contain details of all areas/systems designated by the AE, following his site survey, as requiring an authorisation for access or a Permit to Work. This section should also detail the method for obtaining the Permit to Work or authorisation for access.)

D3 Plant and Equipment Safety

D3.1 Compressed Gases Stored On Site

(This section should contain a list of all compressed industrial gases stored on site, it should be used to identify possible hazardous areas. The list should also detail the volume i.e. bulk storage, individual cylinder, manifolds.)

D3.2 Safety Data Sheets

(This section should contain safety data sheets for gases the Skilled Person may work on or with, including any guidance on handling the cylinders etc.)

D3.3 Actions In Emergency

(This section to detail all actions to be taken in the event of an emergency arising due to or likely to affect any industrial gas cylinder store or installation)

D4 Training

(Details of the qualifications or training required to be achieved before any work can be carried out on the installation to be detailed here.)

ANNEX E

REFRIGERATION PLANT

E1 General

- E1.1 Refrigeration systems present both safety and environmental hazards in terms of system operation, maintenance and repair as well as with regards to refrigerant handling.
- E1.2 The standard pressure system isolation methods and proving techniques detailed in JSP 375 Vol.3 Ch.4 may not be appropriate for refrigeration.

E2 Control of Refrigeration Plant Maintenance

- E2.1 The Authorised Person controls access to refrigeration plant for maintenance purposes.
- E2.2 The Skilled Person is required to provide a risk assessment and method statement to cover the specific maintenance tasks (i.e. a Task Risk Assessment) which takes into account the risks and associated control measures in the workplace based risk assessment, these must be in accordance with EC Regulation 842/2006. The Authorised Person reviews the method statement and risk assessment jointly with those responsible for the maintenance tasks to ensure the risks are suitably controlled and the method statement accords with any operational imperatives.
- E2.3 The Authorised Person can then control the tasks needed to be carried out on the refrigeration plant by:
- Standing Instruction
 - Safety Programme and Statement of Isolation
 - Permit to Work
- depending on the risks involved and based on the refrigeration company's Task Risk Assessments and Method Statements.
- E2.4 Isolation methods and controls will be jointly agreed and will reflect refrigeration engineering requirements and best practice.
- E2.5 It is therefore acceptable (providing the risks are controlled) for an appropriately experienced and qualified refrigeration Skilled Person to carry out maintenance tasks (including those that breach the integrity of the system itself) without invoking a Permit to Work procedure. Such maintenance tasks need to be detailed on a Standing Instruction.
- E2.6 The Skilled Person must isolate and depressurise the system as well as apply his own safety locks.
- E2.7 The Authorised Person is to check that the Skilled Person is following the controls and steps set out in the agreed method statement and risk assessment.

E3 Hazards Associated with Refrigeration Plant and Systems

- E3.1 Some of the common hazards associated with refrigeration plant are listed below. The list is by no means exhaustive:
- noise from machinery

- rotating shafts and machinery
- toxic or flammable refrigerants
- temperature burns (both cold and hot related)
- electrical hazards relating to compressor supply and controls or refrigerant transfer pump
- asphyxiation relating to release of refrigerant
- fire hazard relating to welding/brazing repairs and hydrocarbon based refrigerants
- high pressure - rupture due to plant control and protective device failures
- Confined Space
- hazards associated with inadequate design, poor installation and lack of maintenance
- oils and lubricants associated with the operation and maintenance of refrigeration systems
- unsecured cylinders
- exposure to refrigerant in liquid and vapour forms.

E3.2 These hazards (as well as others identified in any site/installation risk registers or during any site visit) are to be considered in any task related Risk Assessment and associated Method Statement.

E4 Plant and Equipment Safety

E4.1 Operating Instructions

E4.1.1 All refrigeration systems shall have proper and comprehensive operating instructions, a copy of which should be readily available to staff responsible for operation and maintenance.

E4.2 Electrical Equipment

E4.2.1 All electrical equipment and its installations shall comply with current Regulations and DE Standard Specification 034.

E4.2.2 Safety emergency knock off buttons shall be provided in accordance with Regulations.

E4.2.3 Electrical isolation of plant shall enable compliance with JSP 375 Volume 3 Chapter 3 Electrical.

E4.3 Competencies

E4.3.1 Joint Services Publication (JSP) 418 (Environment) specifies that those who maintain refrigerant systems and equipment should be competent and trained in the use and handling of refrigerants. Appropriate registration on the ACRIB Register of Operatives is required.

E4.3.2 In addition to refrigerant handling accreditation any organisation removing and transporting refrigerant off site needs to be licensed to dispose of the refrigerant in accordance with the current Regulations.

ANNEX F

MEDICAL GAS PIPELINE SYSTEMS (MGPS)

F1 Introduction

- F1.1 JSP 375 Volume 3 Chapter 3 Annex F is for use on MOD Establishments and is to be read in conjunction with Health Technical Memorandum (HTM) 02 - Medical Gas Pipeline Systems. Further guidance on the use of Medical Gas Cylinders within the MOD can be found in JSP 319.
- F1.2 Except in the circumstances detailed below, compliance with HTM 02 is mandatory for all persons working on, working near, testing, inspecting or operating MGPS owned or operated by the MOD
- F1.3 MGPS must comply with:
- The Pressure Systems Safety Regulations
MOD Safety Rules and Procedures
HTM 02 - MGPS.
- F1.4 MGPS are pressure systems that provide direct life support. It is this principle which governs all safe systems of work in this area.
- F1.5 All references to HTM 02 shall refer to the current edition.

F2 Medical Gas Pipeline Systems Specific Roles and Duties

- F2.1 Terminology in MOD and NHS Estates documentation differs, in particular the positions and titles of key individuals involved in the application of the safe system of work, the following table equates the titles:

MOD Safety Rules & Procedures JSP 375 Volume 3	NHS Health Technical Memorandum 02
Skilled Person	Competent Person (MGPS)
Person in Charge	Competent Person (MGPS)

F3 Safety, Operation and Maintenance Procedures

F3.1 Scope

- F3.1.1 MGPS are designed to provide a safe and effective method of delivering the required medical gas from the source of supply through a pipeline to the patient. Although the MGPS provide many benefits, they can be the source of a major hazard if any serious failure of procedural use or maintenance occurs. To minimise the risk of failure of supply, all MGPS plant has standby and/or emergency reserve facilities.

F3.1.2 Medical gases are life support systems.

F3.1.3 Although medical gases are not flammable, they vigorously support combustion.

F3.2 Operational Policy

- F3.2.1 All work on MGPS is to be carried out in accordance with the site Medical Gas Operational Policy. This details the day to day operational requirements, arrangements for control, monitoring of modifications, maintenance and training.

F3.3 **Operational Requirements**

- F3.3.1 The guidance contained in the HTM 02 will be followed for all new MGPS works, refurbishment, maintenance and upgrading of existing MGPS.
- F3.3.2 Contractors who carry out work on MGPS shall be registered BS EN ISO 9000 and only carry out work within the area authorised by the Permit to Work.
- F3.3.3 Only the Authorised Person (MGPS), under normal conditions, has the authority to take a system or any part of a system into or out of use.

F3.4 **Maintenance Instructions**

- F3.4.1 MGPS are to be maintained to designers', manufacturers' and suppliers' recommendations.

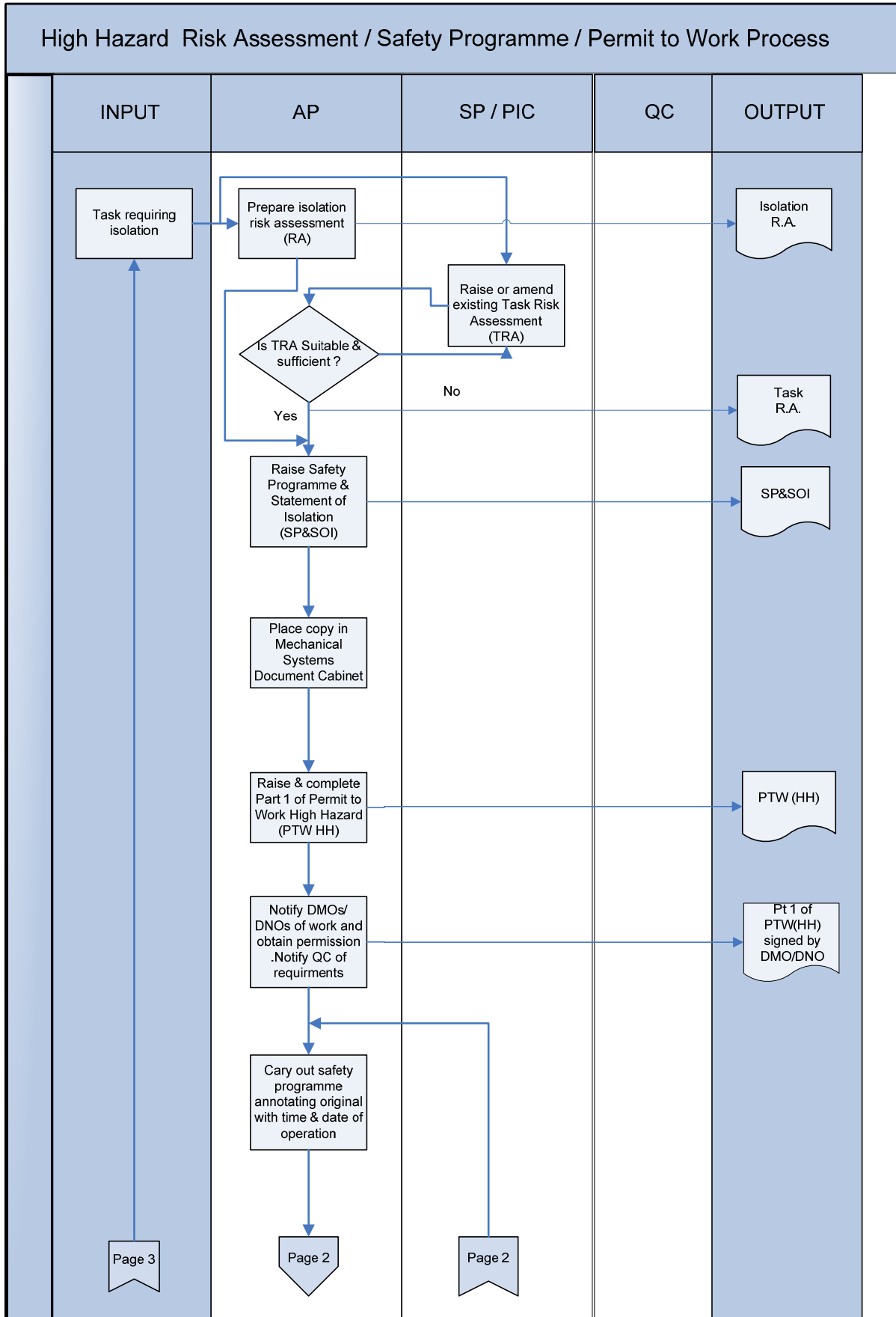
F3.5 **Corrective Actions, Notification of Imminent Danger and Operational Restrictions**

- F3.5.1 Corrective actions, notifications of imminent danger and operational restrictions can be instituted on MGPS, however, the requirement to continue to provide the minimum gas delivery pressures needs to take precedence.

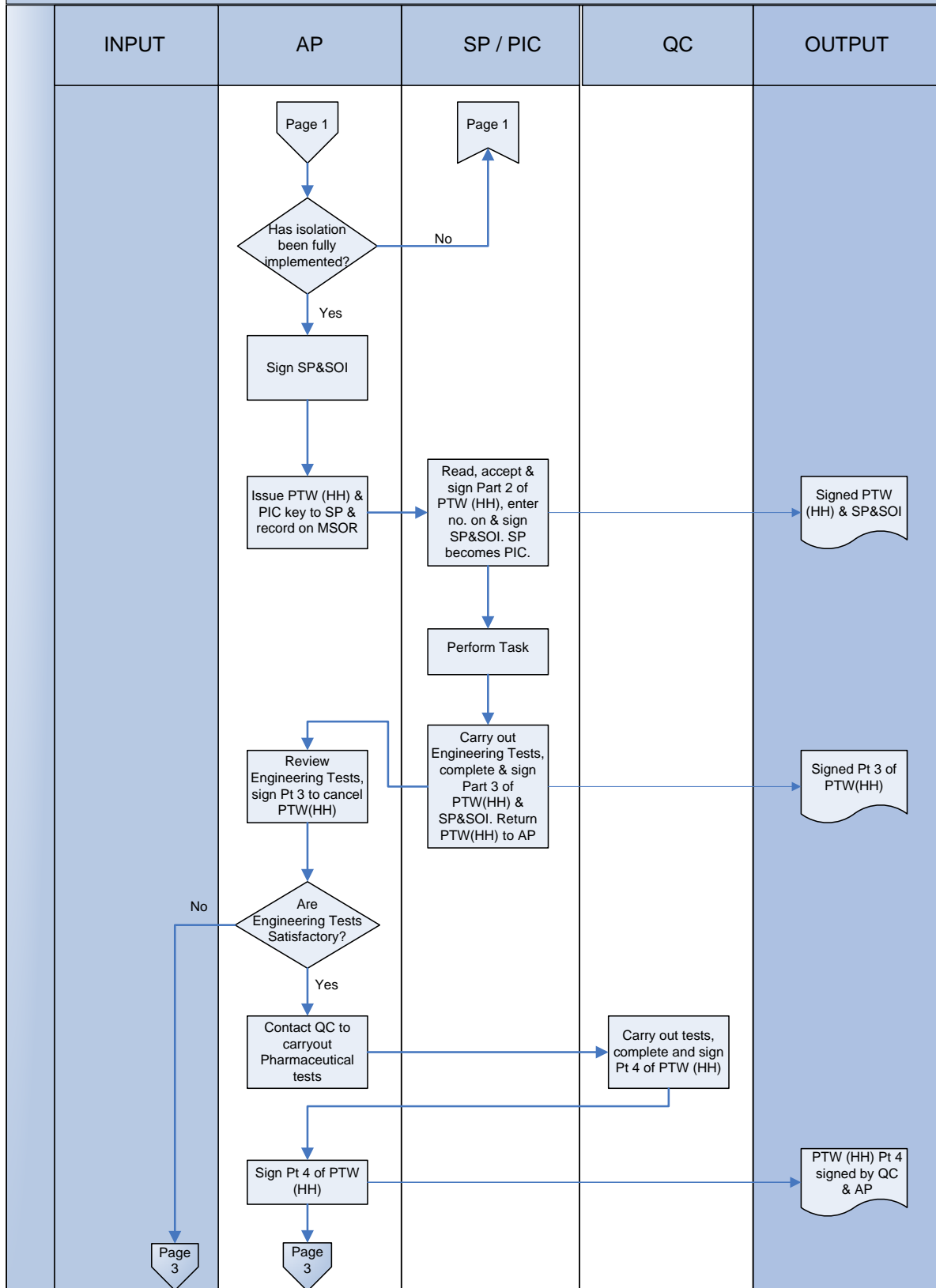
F3.6 **Keys and Key Cabinets**

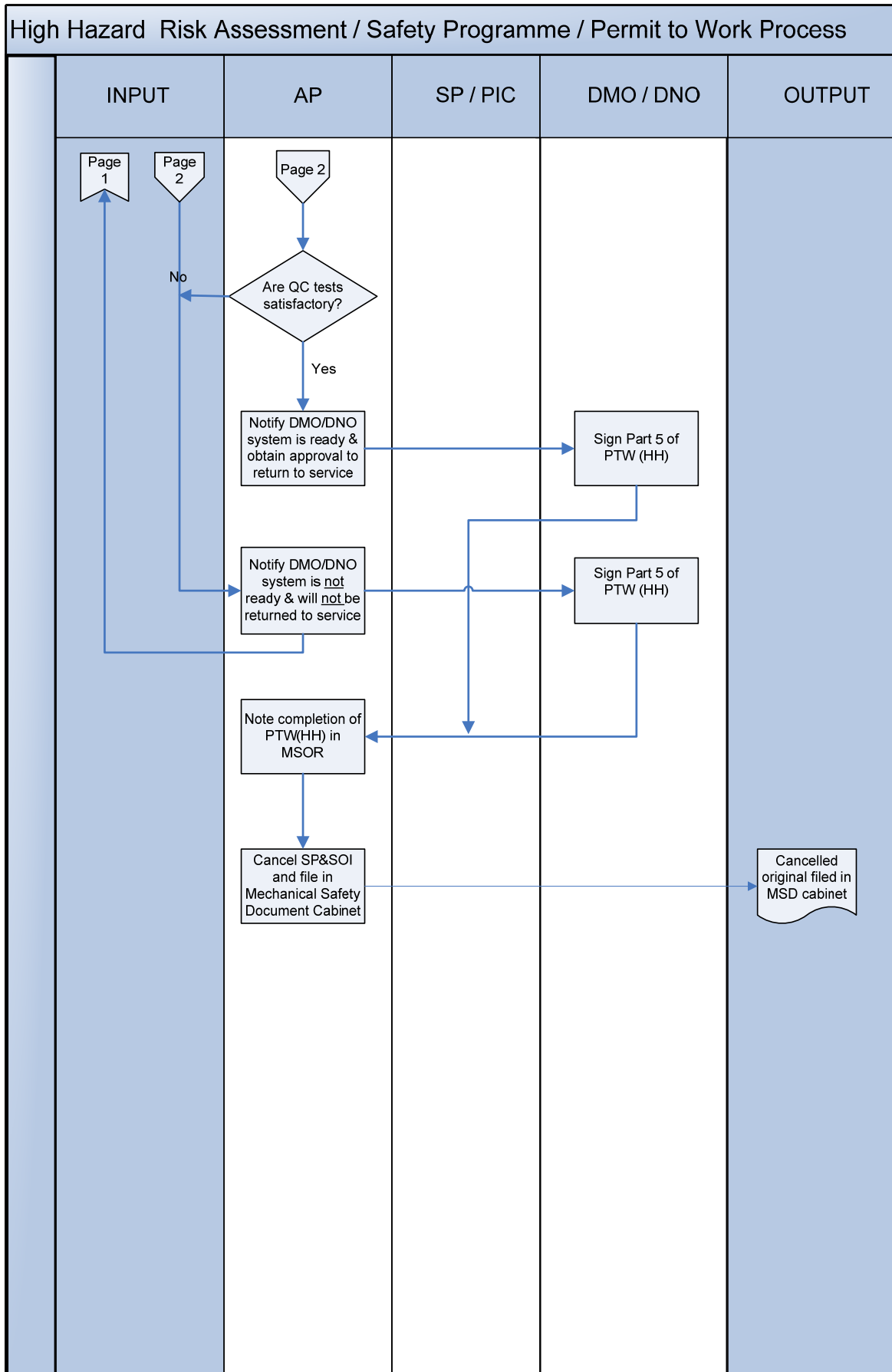
- F3.6.1 The issue of keys will be controlled by the Authorised Person (MGPS).
- F3.6.2 A single key to each plant/manifold room will be issued to, and signed for by, the Line Manager for issue to the Designated Porter (MGPS) to permit cylinder replacement and maintain stock levels.

High Hazard Process

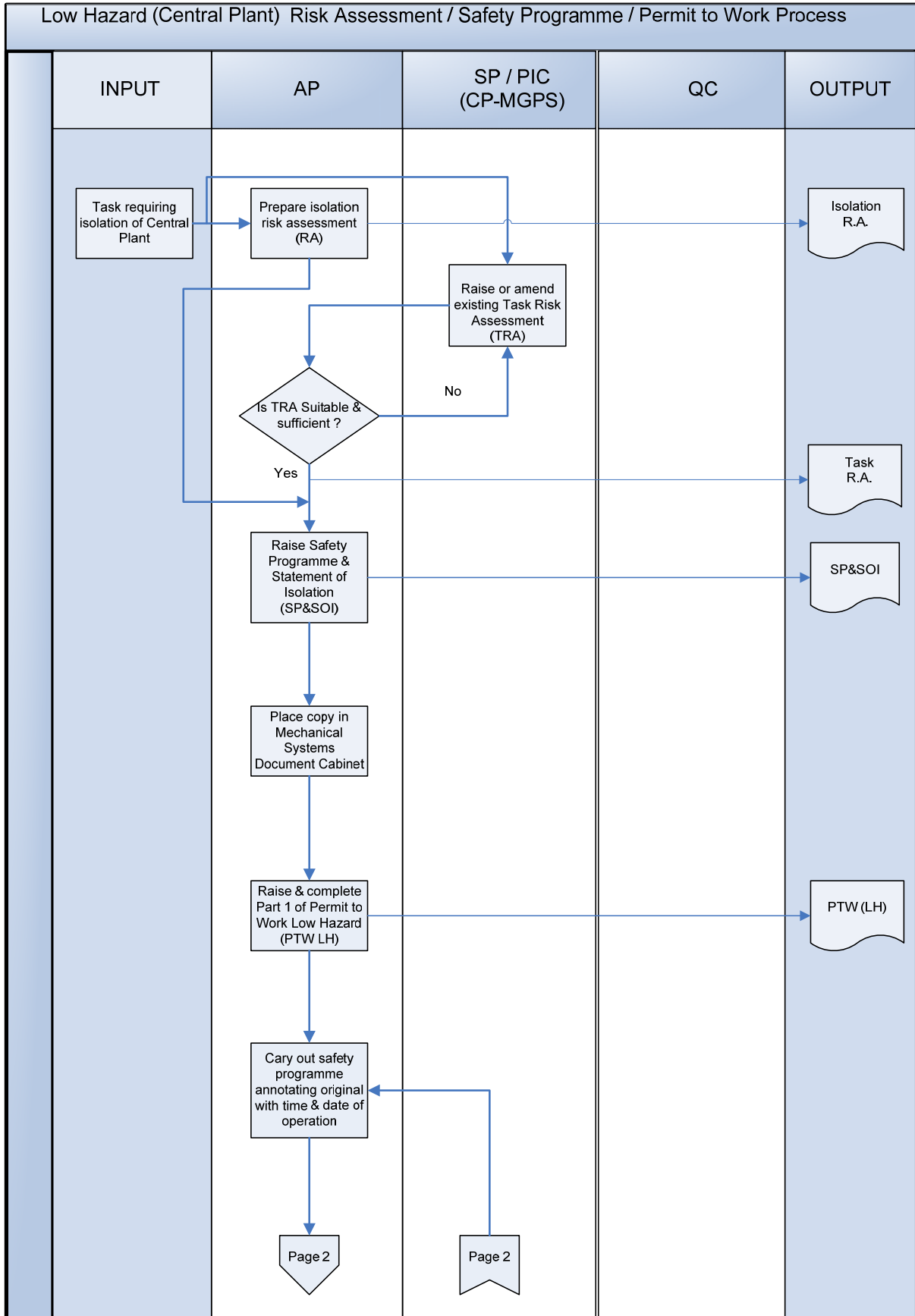


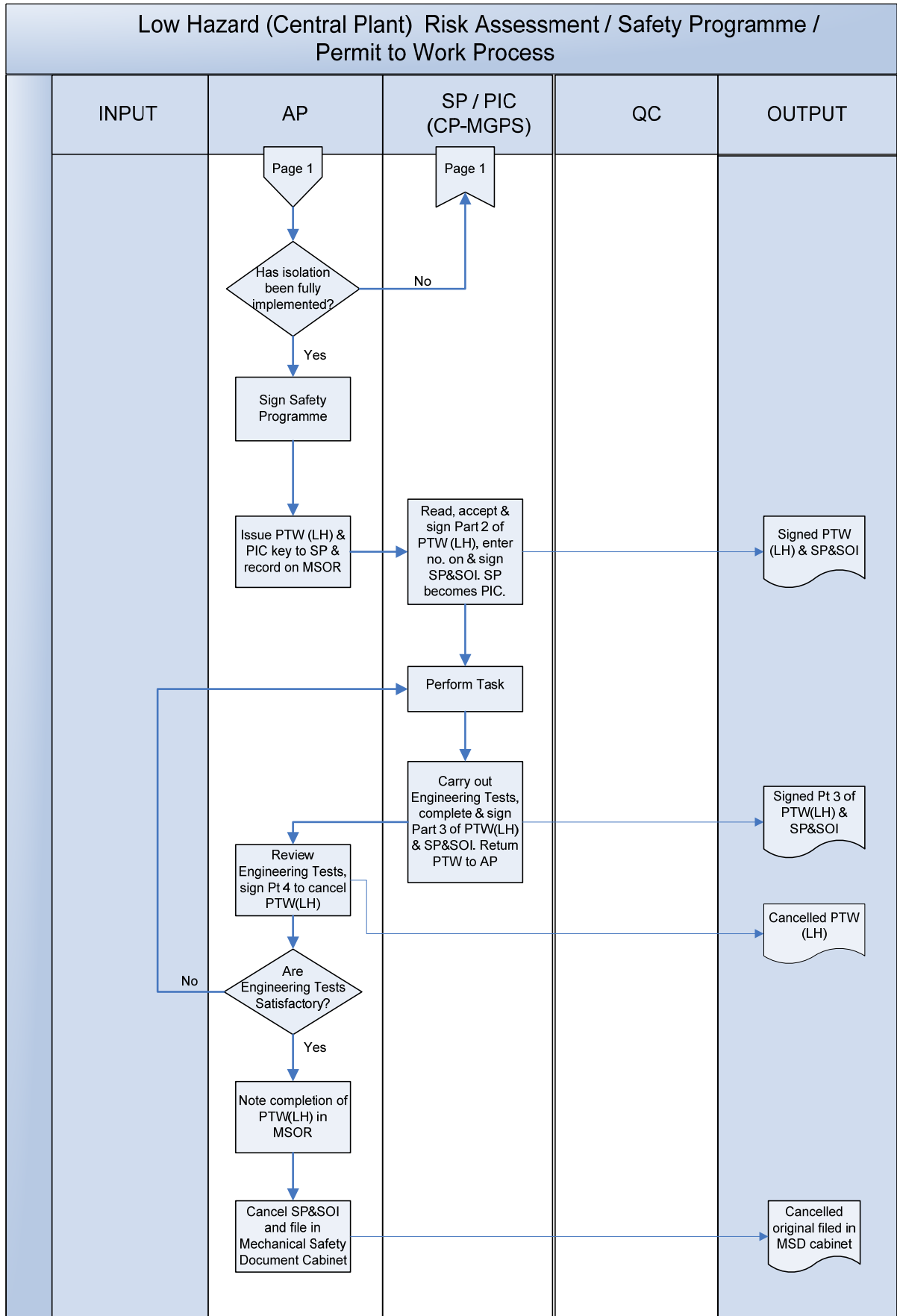
High Hazard Risk Assessment / Safety Programme / Permit to Work Process - Page 2



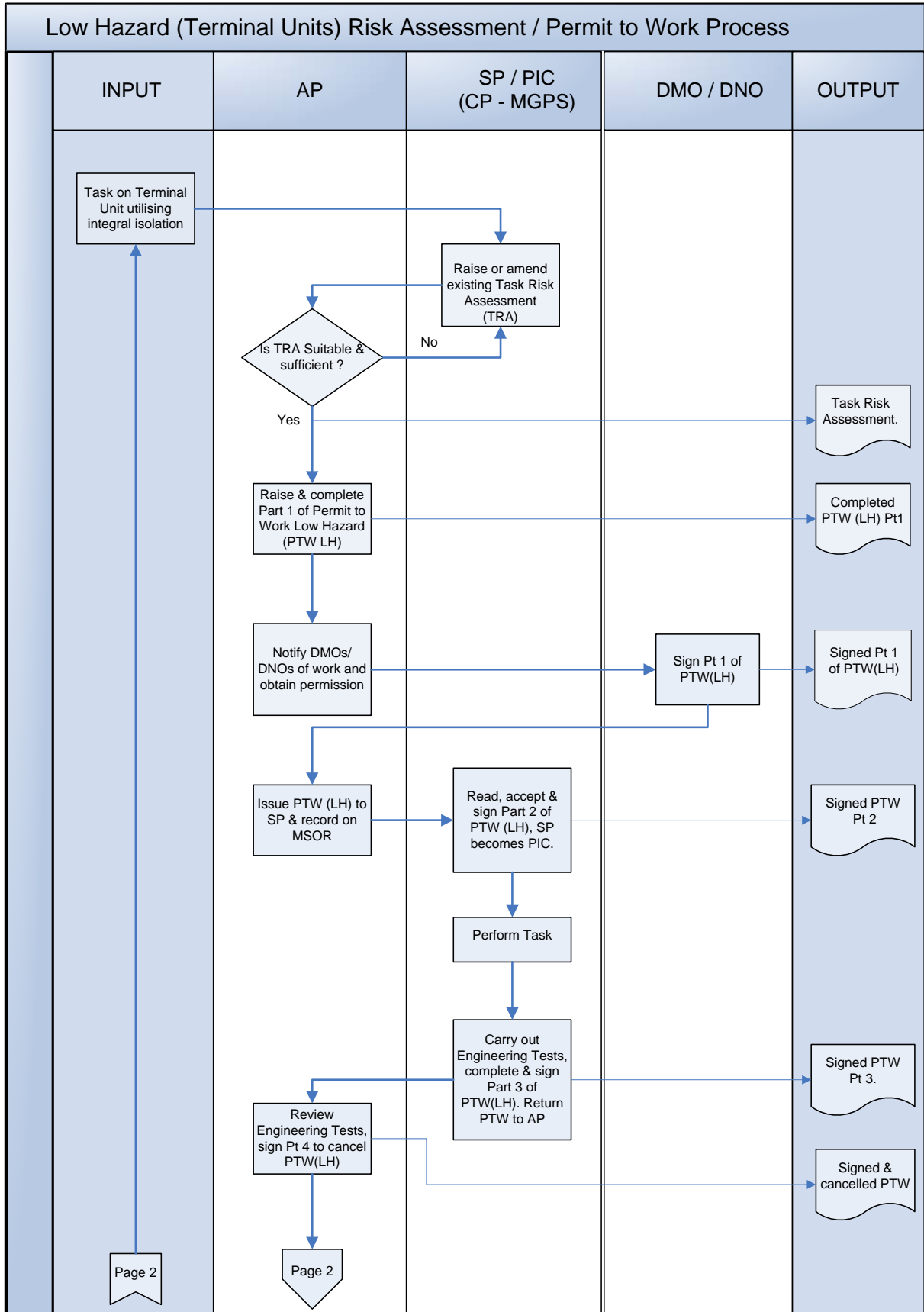


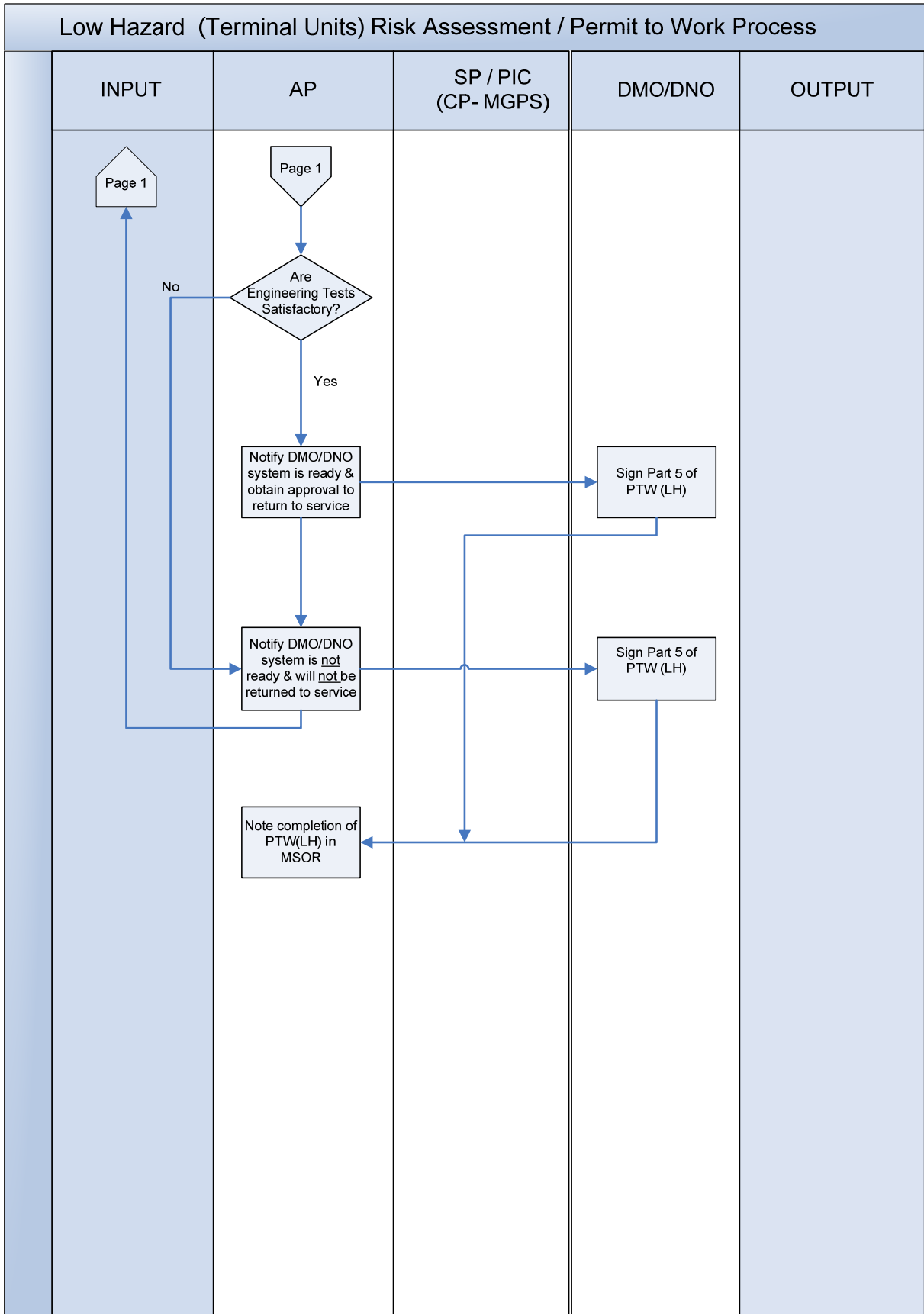
Low Hazard (Central Plant) Process





Low Hazard (Terminal Units) Process





ANNEX G

DENTAL AIR AND VACUUM SYSTEMS (DAVS)

G1 Introduction

- G1.1 Dental hospitals, clinics and surgeries require compressed air to power dental instruments and a vacuum system to remove detritus from the operation site.
- G1.2 NHS Estates Health Technical Memorandum 2022 Supplement No 1 - Dental Compressed Air and Vacuum Systems gives definitive guidance on the design, installation, validation, verification, operational management and maintenance of compressed air and vacuum systems for use in dental hospitals, surgeries and clinics. The Supplement needs to be read in conjunction with HTM 02.

G2 Terminology

- G2.1 Terminology in MOD and NHS Estates documentation differs, in particular the positions and titles of key individuals involved in the application of the safe system of work, the following table equates the titles:

MOD Safety Rules & Procedures JSP 375 Volume 3	NHS Health Technical Memorandum 2022 Supplement 1
Skilled Person	Competent Person (MGPS)
Person in Charge	Competent Person (MGPS)

- G2.2 For those MOD sites which only have DAVS an Authorised Person (Mechanical) who has been suitably trained, assessed and appointed in accordance with these rules is to assume the duties of an Authorised Person (MGPS) as defined in NHS Estates Health Technical Memorandum 2022 Supplement No 1 - Dental Compressed Air and Vacuum Systems.

G3 Application

- G3.1 All MOD sites which have DAVS are to adopt JSP 375 Volume 3 & NHS Estates Health Technical Memorandum 2022 Supplement No 1 - Dental Compressed Air and Vacuum Systems.

G4 Operational Policy

- G4.1 All work on DAVS is to be carried out in accordance with the site DAVS Operational Policy. This details the day to day operational requirements, arrangements for control, monitoring of modifications, maintenance and training.

G5 Operation and Maintenance

- G5.1 All works which are likely to effect the normal operation of the systems will require prior authorisation by the Authorised Person.

DAVS Process

