

# **Code of Practice**

# **PRESSURE SYSTEMS**

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## 1 Purpose and Scope

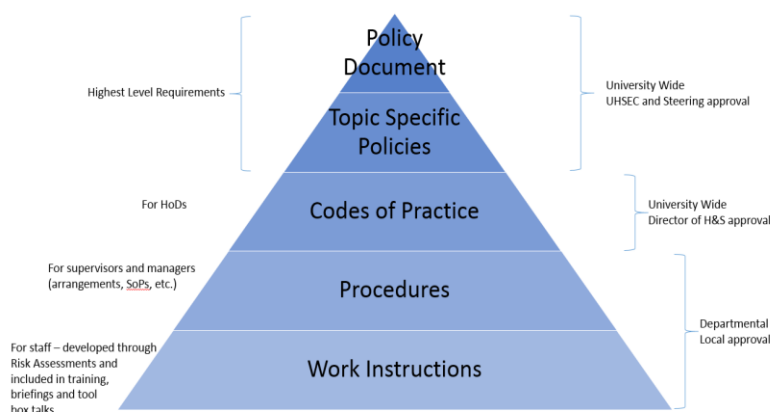
This Code of Practice (CoP) applies to all pressure systems used by staff, students, and visitors at the University of Warwick. Specifically, it details the University-wide arrangements and responsibilities for the procurement, management, design, installation, maintenance, examination and use of pressure systems.

This CoP does not apply to pressure systems under the control of third parties (such as contractors).

This CoP forms part of the University of Warwick's Occupational Health and Safety Management System and supports the University of Warwick Pressure Systems Policy. It should be read in conjunction with the Policy and the associated guidance on the management of pressure systems, which are available on the University's Health and Safety web pages (Ref. 1).

Departmental/Estates arrangements for all other aspects of the management of pressure systems are detailed in local procedures, including Standard Operating Procedures (SOPs) and Work Instructions, as indicated in the document hierarchy below:

**Figure 1: Health and Safety Document Hierarchy**



This CoP is based on a new 'corporate approach' to overall accountability for statutory inspections and compliance at the University<sup>1</sup>, with an initial focus on departments with a high volume of high-risk assets<sup>2</sup>.

In the case of lease or licence arrangements, due consideration must be given to the extent, access, proposed use, maintenance, and examination of any pressure systems falling wholly or partially within the demise of the relevant lease or licence. This applies to circumstances wherein the University is either landlord or tenant/occupier. Leases, Licences, and other agreements will be handled through the Estates office and must be in accordance with an application form process. For further information refer to the [Property Management](#) web page.

Note: The University arrangements for 'bulk storage' pressure systems are currently under review and it is intended to develop a topic specific Code of Practice for those systems to complement this CoP.

<sup>1</sup> The 'corporate approach' is a new initiative to align the way statutory inspection and compliance of equipment is managed across the University. Some of the accountabilities and responsibilities described within this document have therefore changed or are new. As such, there will be a transition period for this new approach to be fully implemented.

<sup>2</sup> Departments with the highest volume of high-risk assets: Life Sciences. WMG, Medical School, Engineering, Chemistry and Physics.

## 2 Introduction

Equipment and systems containing a liquid or gas under pressure can be found throughout the University, particularly in building systems and within labs and workshops. If pressure equipment fails in use or if the contents are released unintentionally, it could injure people nearby and cause serious damage to property.

To minimise the risk of failure, pressure systems have specific requirements and the legislation places duties on an employer. The principal legislation covering pressure equipment and pressure systems are the Pressure Equipment Regulations 1999 (Ref. 2) and the Pressure Systems Safety Regulations 2000 (Ref. 3), supported by the Approved Code of Practice, L122 (Ref. 4). Pressure equipment is also 'work equipment', and so the Provision and Use of Work Equipment Regulations 1998 (Ref. 7) also apply.

Further guidance is provided by the Health and Safety Executive in the document 'Pressure systems, a brief guide to safety', INDG261 (Ref. 5).

The objective of the management arrangements described within this code of practice is to ensure compliance with regulation and to protect employees, students, third party occupiers, contractors and inspectors or any others that might use, operate, hire, maintain or inspect pressure systems used at the University.

### 2.1 Definitions

A pressure system is defined by PSSR 2000 (Ref. 3) as:

- a system comprising one or more pressure vessels of rigid construction, any associated pipework and protective devices.
- the pipework with its protective devices to which a transportable pressure receptacle is, or is intended to be, connected; or
- a pipeline and its protective devices,

which contains or is liable to contain a relevant fluid<sup>3</sup>, but does not include a transportable pressure receptacle<sup>4</sup>.

Types of pressure systems in use at the University may include:

- boilers and steam heating or steam generating systems
- pressurised process plant and piping
- compressed air systems (fixed and portable)
- pressure cookers, autoclaves, and retorts
- cryogenic or liquified gas storage vessels (fixed systems, including 'bulk storage')
- heat exchangers and refrigeration plant
- valves, steam traps and filters
- pipework and hoses
- pressure gauges and level indicators

Note that some pressures systems and pressure vessels may be incorporated within plant or machinery, and therefore may not be immediately recognisable as such.

A decision tree is available to help determine if the Regulations apply to any particular pressure system (see Ref. 4: Pressure Systems Safety Regulations 2000. Approved Code of Practice, ACOP L122, Figure 1).

<sup>3</sup> Examples of a "relevant fluid" encountered in the University are steam (at any pressure), a gas (0.5 bar above atmospheric pressure), or a liquid with a vapour pressure greater than 0.5 bar at operating temperature or 17.5°C.

<sup>4</sup> Gas cylinders are transportable pressure receptacles and are subject to other legislation.

A 'written scheme of examination' (herein referred to as WSE) is required for most pressure systems. A periodic examination must then be performed for those parts of the system covered by the written scheme of examination.

Further information concerning WSE can be found in chapter 4.4.

## 2.2 Competence

PSSR 2000 (Ref. 3) requires that a 'competent person' is used in connection with two distinct functions:

- drawing up or certifying written schemes of examination; and
- carrying out examinations under the scheme.

Bodies that have United Kingdom Accreditation Service ([www.ukas.com/](http://www.ukas.com/)) accreditation to the British, European and international standard BS EN ISO/IEC 17020: 2004, for the scope of in-service inspection of pressure equipment, can provide competent persons meeting the appropriate criteria.

For pressure systems owned by the University, Insurance Services department and Estates department contract with third-party organisations who provide independent inspection services for the University, including provision of such 'competent person(s)'.

In addition, the Management of Health and Safety at Work Regulations 1999 and PUWER 1998 (Ref. 6) require a level of competence for whoever:

- uses pressure systems;
- specifies requirements of pressure systems;
- designs or selects pressure systems;
- checks, tests or maintains pressure systems;
- supplies, installs, or otherwise provides pressure systems, advice on such systems or other services to the University.

Records of all staff and student training on pressure systems shall be recorded and retained in accordance with the University Records Retention Schedule (Ref. 11).

When procuring new pressure systems, the supplier shall be required to provide operating instructions for all the equipment and for the control of the whole system including emergencies. Departments must ensure that the appropriate staff and students have access to these instructions and are properly trained in the operation and use of the equipment or system.

Further details concerning training and awareness required for working with pressure systems should be made available with the specific equipment. General guidance is also available on the University's Health and Safety web pages (Ref. 1).

## 3 Responsibilities

The principal responsibilities for the management of health and safety are stated in the University of Warwick Health and Safety Policy (with line management/delegation of duty described in the document 'Leadership and Management of Health and Safety at the University of Warwick') and complemented by a topic specific Policy for Pressure Systems. These documents are available via the University's Health and Safety web page: <https://warwick.ac.uk/services/healthsafetywellbeing/guidance/handspolicy>.

This document further clarifies the specific accountability and responsibilities held by roles within the University, in relation to pressure systems, and following the new 'corporate approach'. These responsibilities are summarised within the Responsibilities Grid for Pressure Systems (Appendix A) and allocated as described in the following sections.

Note: Certain specialist departmental pressure systems may not be covered under the framework contract for examination or maintained by Estates. In these cases, the owning/using department is responsible for ensuring such pressure equipment is appropriately examined and maintained and is still asset tagged and registered by the completion of the Statutory Inspection Report Form (Ref. 10).

### **3.1 Duties of the Group Finance Director (Accountable Person for Pressure Systems)**

The accountability for ensuring legal compliance with regards the maintenance, servicing, and examination of pressure systems within the University rests with the Group Finance Director, who has delegated the responsibility for the discharging of these duties to the Director of Estates.

The Group Finance Director remains accountable for:

- ensuring adequate budget and resource is made available for the examination, maintenance, remedial work and any training required to ensure compliance of pressure systems with the relevant legislation and guidance;
- ensuring that non-compliances notified to them are addressed, without undue delay.

### **3.2 Duties of the Director of Estates (Responsible Person for Pressure Systems)**

The Director of Estates is responsible for discharging duties of the accountable person for pressure systems, including:

- ensuring compliance with any relevant statute, ACOP, standard or guidance concerned with the installation of fixed systems and the maintenance, servicing, examination and inspection of pressure systems;
- ensuring implementation of Pressure Systems Policy, this Code of Practice and the associated arrangements, instructions and guidance, in areas under their control;
- ensuring the allocation of any necessary budget and resources for areas within their responsibility;
- ensuring availability of suitably trained and competent staff/contractors for maintenance tasks;
- ensuring that a suitably trained and competent person is assigned as the Estates Technical Lead for Pressure Systems (see Chapter 3.2.1);
- ensuring the escalation of any non-compliance reported to them, to the Accountable Person.

The Director of Estates shall be assisted in the discharging of these duties by the involvement of competent personnel or contractors and supported by the Estates Technical Lead for Pressure Systems and the Health and Safety Lead for Pressure Systems.

Where the Director of Estates has employees engaged in the use of pressure systems, they shall also assume the duties allocated to Heads of School/Department (see chapter 3.5).

#### **3.2.1 Duties of the Estates Technical Lead for Pressure Systems**

Appointed, by the Director of Estates or other member of the Estates management team, the Estates Technical Lead for Pressure Systems (herein referred to as the Technical Lead) shall be the lead advisor within the University on matters relating to the technical and engineering aspects of pressure systems. The Technical Lead, working with the H&S Lead and supported through engagement of competent personnel or consultants, as necessary, is responsible for:

- ensuring they maintain and keep up to date technical knowledge of industry standards and best practice concerning pressure systems and understanding of the relevant legislation, ACOPs and sector guidance, communicating any updates that may impact others in the organisation;
- providing technical advice to the accountable person, and any other person allocated responsibility in this document, on the engineering aspects for pressure systems that must be achieved with respect the discharging of their duties. These include, but are not necessarily limited to,

specification, design, procurement, maintenance, servicing, examination, inspection and operation of pressure systems;

- providing internal technical guidance in relation to the selection, procurement and installation of new assets, maintenance, servicing, examination, inspection and operation of pressure systems;
- identifying any technical training and awareness required, across the University;
- supporting the development of policy and the creation and update of departmental SOPs;
- reviewing requests for new pressure systems, as advised to them by Departments or Capital Programmes, and advising on suitability with the new or existing building infrastructure;
- providing technical advice concerning the generation of documents essential to system compliance, where these have not historically been in place;
- highlighting any non-compliance discovered or reported to them, to the person responsible, escalating if required.

### 3.2.2 Duties of the Capital Programme Director (Estates)

The Capital Programme Director, supported by their respective programme/project managers and engagement of competent personnel or consultants, as necessary, is responsible for:

- ensuring that requests for new pressure systems or modifications to existing pressure systems, made via an Estates project, are reviewed by the Technical Lead and H&S Lead and in conjunction with the risk assessment provided by the requesting department;
- ensuring that the specification of new pressure system that are supplied through Estates meet the requirements of legislation, ACOPs, standards and guidance, as appropriate;
- ensuring that when procuring new pressure systems, the requirements outlined in chapter 4.1 (System Specification, Design and Procurement) are followed;
- ensuring that any pressure system installed or modified during a project is appropriately commissioned, and that the commissioning is witnessed by the client and by maintenance representatives and advised upon by the H&S and Technical Leads;
- ensuring that, following installation of new pressure systems, details of the assets are provided to Estates Information and Systems team in order that they can be registered and added to any necessary PPM and examination schedule immediately following handover;
- ensuring the timely receipt of all required documentation and the provision of such documentation and asset information (in the required format) to the Estates Information and Systems, the department, and to maintenance (see Chapter 4.5, Documentation and Record Keeping);
- ensuring periodic review of the Mechanical Electrical and Public Health (MEP) Design Standards (involving the Technical Lead and H&S Lead, as required) to ensure that they remain current with the applicable legislation and standards.

Appendix C provides an overview of the process used for Estates capital projects involving pressure systems.

### 3.2.3 Duties of Director of Operations (Estates)

The Director of Operations, supported by their respective managers, is responsible for:

- planned preventative maintenance (PPM), examination and remedial maintenance of all pressure systems which have been notified to Estates, or are owned/managed by Estates (except for any specific specialist pressure systems, as agreed with the owning/using department);
- ensuring suitable resource and budget are available for PPM, examination, remedial maintenance and any associated training for Estates staff;
- escalating any non-compliance discovered or notified to them, to the Responsible Person.

### 3.2.3.1 Duties of the Head of Maintenance (Estates)

The Head of Maintenance, supported by their personnel, is responsible for:

- putting into place arrangements for maintenance and remedial works relating to pressure systems which have been notified to Estates (except for any specific specialist pressure systems, as agreed with the owning/using department);
- ensuring that any information arising from maintenance, examination or remedial works, under their direction or control, is retained and communicated to relevant stakeholders;
- providing to any employees under their control, the information, instruction and training required for proper execution of that role;
- ensuring that any person required to undertake work on pressure systems has sufficient competence to safely complete the task, and that any relevant arrangements have been made to mitigate risks to safety;
- ensuring appropriate contractors are appointed and managed in accordance with the University Contractor Management Policy and associated guidance (Ref. 12);
- assigning a Contract Supervisor for pressure systems maintenance, to manage any contracts with external specialists and to act as the primary interface between Estates and departments with regards to the maintenance of pressure systems (see Chapter 3.2.3.2);
- addressing, through engagement of competent personnel or contractors and supported by the H&S Lead and Technical Lead, the generation of documents essential to system compliance, where these have not historically been in place;
- reporting back to the Director of Operations and Head of Assurance, Risk & Property any non-compliance discovered or notified to them.

### 3.2.3.2 Duties of the Contract Supervisor for Pressure Systems Maintenance (Estates)

The Contract Supervisor for Pressure Systems Maintenance is the prime interface to any external contactor providing a maintenance and remedial service for pressure equipment, as contracted by Estates. Supported by the involvement of technical personnel, as necessary, they are responsible for:

- ensuring that any contractor required to undertake work on pressure systems has sufficient competence to safely complete the task, and that any relevant arrangements have been made to mitigate risks to safety;
- ensuring that the external contractor(s) providing maintenance and remedial works for pressure systems is delivering the required level of service, including notification of the of any issues and delivery of documentation in a timely manner;
- ensuring that all contractors complete the necessary induction for the areas where they will be working;
- ensuring that the contractor provides a task-specific risk assessment for the work to be undertaken;
- timetabling and coordinating maintenance and remedial works for each Department/School in consultation with the Departmental Point of Contact(s) for Pressure Systems (see Chapter 3.5.1.1).

Note: Not all pressure systems will have the same Contract Supervisor for maintenance so there will be more than one of these roles, e.g., for hot water systems, compressed air systems, etc.

### 3.2.4 Duties of the Head of Assurance, Risk and Property (Estates)

The Head of Assurance, Risk and Property is responsible for:

- ensuring that spot checks and planned audits are carried out to provide assurance that activities relating to pressure systems installation, management, maintenance, and examination are being



performed in compliance with the Policy and arrangements. Thus, providing a 'second line of defence' for assurance, as illustrated in Appendix B;

- ensuring that there are sufficient, suitably trained and competent staff to carry out such assurance tasks;
- Appointing a Contract Supervisor for Pressure Systems Examination to manage the day to day operational aspects of the inspection and examination services for pressure equipment, as contracted by Procurement and Insurance Services Department (see Chapter 3.2.4.1);
- seeking assurance that the arrangements for leasing of spaces includes due consideration of the extent, access, proposed use, maintenance, and examination of any pressure systems falling wholly or partially within the demise of the lease. This applies to circumstances wherein the University is either landlord or tenant/occupier.
- reporting back to the Responsible Person and Director of Operations any non-compliance discovered or notified to them.

#### **3.2.4.1 Duties of the Contract Supervisor for Pressure Systems Examination (Estates Assurance, Risk and Property)**

The Contract Supervisor for Pressure Systems Examination, supported by the involvement of technical personnel, as necessary, is responsible for the operational aspects of the inspection and examination services for pressure equipment, as contracted by Procurement and Insurance Services Department, including:

- checking that the external contractor(s) providing examination services for pressure systems is delivering the required level of service, including notification of the examination results and delivery of documentation in a timely manner, escalating any issues to the Insurance Services Manager as necessary;
- ensuring that any information and reports arising from inspections and examinations, under their direction or control, is made accessible to all of the Departmental Point of Contacts for Pressure Systems (currently this information is made accessible through the online system provided as part of the examination service);
- working with the appointed contractor and with the Departmental Point of Contact(s) for Pressure Systems to help facilitate examination of pressure systems and supporting any relevant arrangements to mitigate risks to safety (see Appendix F for an overview of the process flow for examination);
- reporting back to the Head of Assurance, Risk and Property any non-compliance discovered or notified to them.

#### **3.2.5 Duties of the Head of Estates Information and Systems**

The Head of Estates Information and Systems is responsible for:

- maintaining the asset register of pressure systems and equipment, as notified to Estates;
- retention of the install and initial commissioning documents received by Estates, in relation to pressure systems;
- retention of the examination documents received by Estates, in relation to pressure systems;
- making these documents and information available to those stakeholders requiring access to such as part of the responsibilities allocated herein.

These documents and information shall be retained in accordance with the relevant legislation and the University Records Retention Schedule (Ref. 11).

Appendix D provides an overview of the asset recording process to be used at the University.

### 3.3 Duties of the Director of Health and Safety

The Director of Health and Safety is responsible for:

- ensuring that the University's Health and Safety web pages for pressure systems are kept up to date with the related policy and guidance documents and these are communicated to stakeholders;
- ensuring that a suitably trained and competent person is assigned as the Health and Safety Lead for Pressure Systems (see Chapter 3.3.1);
- providing health and safety resource to advise and support departments, to enable the departments to produce suitable and sufficient risk assessments and procedures for activities involving the use of pressure systems;
- ensuring that spot checks, inspections and internal planned audits are carried out to provide assurance that activities relating to the management and use of pressure systems are being performed in compliance with the Policy and arrangements. Thus, providing the 'second line of defence' and 'third line of defence' for assurance, as illustrated in Appendix B;
- providing any appropriate intervention to prevent ongoing and/or repeated non-compliance that gives rise, or could give rise, to statutory breach and/or a risk to health or the environment;
- reporting back to the Responsible Person, Head of Assurance, Risk and Property and the appointed H&S Lead any non-compliance discovered or notified to them.

#### 3.3.1 Duties of the Health and Safety Lead for Pressure Systems

Appointed, by the Director of Health and Safety, the Health and Safety Lead for Pressure Systems (herein referred to as the H&S Lead) shall be the lead advisor within the University on matters relating to pressure systems safety. The H&S Lead, working with the Estates Technical Lead and supported through engagement of competent personnel or consultants, as necessary, is responsible for:

- ensuring they maintain and keep up to date knowledge of the health and safety legislation and associated Regulations, ACOPs or sector guidance concerning pressure systems, communicating any relevant updates that may impact others in the organisation;
- providing advice to the accountable person, and any other person allocated responsibility in this document, on the health and safety standards and regulations that must be achieved with respect to the discharging of their duties. These include, but are not necessarily limited to, design, procurement, maintenance, servicing, examination, inspection and use of pressure systems;
- providing internal guidance in relation to the creation and installation of new assets, maintenance, servicing, examination and inspection and use of pressure systems;
- identifying any health and safety training and awareness required, across the University;
- supporting the development of policy and the creation and update of departmental SOPs;
- reviewing requests for new pressure systems, as advised to them by Departments or Capital Programmes, and providing health and safety advice;
- providing health and safety advice concerning the generation of documents essential to system compliance, where these have not historically been in place;
- highlighting any non-compliance discovered or reported to them, to the person responsible, escalating if required.

Note: The H&S Lead is not an Engineer or technical person, but someone with the necessary Health and Safety background, experience, and training to be able to interpret the associated Regulations, ACOPs or sector guidance, etc. They would typically be a chartered Health and Safety professional (CMIOSH) responsible for interpretation of law/HSE requirements and advising others within the University accordingly.

### 3.4 Duties of the Insurance Services Manager (Procurement and Insurance Services)

The Insurance Services Manager is responsible for the commercial aspects of the inspection and examination services for pressure equipment, as contracted by Procurement and Insurance Services Department, including:

- putting into place a University-wide contract for an inspection and examination service for University owned pressure equipment, including the creation of WSE and the undertaking examinations, as required under PSSR;
- ensuring that any contractor that prepares the WSE or undertakes examination of pressure systems has sufficient competence to safely complete the task, and that any relevant arrangements are made to mitigate risks to safety;
- ensuring that the external contractor(s) providing examination services for pressure systems is delivering the required level of service;
- working with the Head of Assurance, Risk & Property and the Head of Maintenance to ensure that the operational aspects associated with the inspection and examination service are managed effectively and addressed in a timely manner;
- ensuring that any information and reports arising from inspections and examinations, under their direction or control, is retained and communicated to relevant stakeholders (currently this information is made accessible through the online system provided as part of the examination service);
- reporting back to the Director of Operations, Director of Health and Safety, and Head of Assurance, Risk & Property any defects discovered or notified to them that have been/will be reported to the HSE or result in a time dependent repair or prohibition.

The Insurance Services Manager shall be supported by the Contract Supervisor for Pressure Systems Examination in managing the operational aspects of the examination services for pressure equipment (see 3.2.4.1).

### 3.5 Duties of Heads of School/Department

Heads of Schools/Departments, supported by their respective managers and personnel, are responsible for:

- ensuring local implementation of the Pressure Systems Policy, this Code of Practice and the associated arrangements, instructions and guidance, in areas under their control;
- ensuring that departmental procedures (SOPs, work instructions, local emergency procedures) are created and communicated, detailing how an activity or process using pressure systems within that department is to be carried out, managed and monitored;
- identifying the department's Point of Contact(s), to act as the primary interface(s) to Estates and users with regards to pressure systems (see Chapter 3.5.1.1);
- ensuring the production and review of suitable and sufficient risk assessments for activities involving pressure systems under their control;
- ensuring the identification, implementation and monitoring of control measures concerning risks from pressure systems under their control;
- ensuring that local arrangements are put in place for the examination, inspection and maintenance of any specialist departmental pressure systems not covered under the University's framework contract for examination or maintained by Estates.
- ensuring that local arrangements are put in place concerning the filling and decanting of cryogenic liquids or liquified gases within pressure systems under their control;

- ensuring that departmental assurance checks are carried out at agreed intervals, documented and made available to the Director of Health and Safety and the Director of Estates or their nominated deputies;
- ensuring that they have visibility of reports relating to examination, preventative maintenance and remedial maintenance of pressure systems in the areas under their control;
- ensuring the escalation of any non-compliance reported to them, to the Responsible Person.

### **3.5.1 Duties of Technical Service Managers / Facilities Managers**

Technical Service Managers and Facilities Managers within Schools/Departments, supported by their respective managers and staff, are responsible for:

- ensuring that any person under their control required to undertake work on pressure systems has sufficient competence to safely complete the task, and that any relevant arrangements have been made to mitigate risks to safety;
- cooperating with arrangements for maintenance, examination and remedial works, providing local technical and facilities support, as required;
- ensuring that departmental checks are carried out to provide assurance that activities relating to pressure systems maintenance and examination are being performed in compliance with the Policy and arrangements. Thus, providing a 'first line of defence' for assurance, as illustrated in Appendix B;
- escalating any non-compliance discovered or reported to them, to the Head of School/Department and to the Director of Operations, as appropriate.

In many departments the Technical Service Manager/Facility Manager will also assume the responsibilities of the Point of Contact for Pressure Systems (see Chapter 3.5.1.1).

#### **3.5.1.1 Duties of Point of Contact for Pressure Systems (School/Department)**

Departmental Point of Contact(s) for Pressure Systems are responsible for:

- validating that all pressure systems used within their department or facility are asset tagged and included in the register of items maintained/inspected through Estates;
- working with Estates Maintenance, the Contract Supervisor for Pressure Systems Maintenance and the Contract Supervisor for Pressure Systems Examination and the appointed contractor to locally timetable and facilitate maintenance/inspection visits, examination and remedial works related to pressure systems (see Chapter 4.4 and Appendix F for more details regarding examination);
- informing end users when pressure systems equipment has failed examination, ensuring it is marked as unfit and taken out of use, until remedied;
- monitoring, and escalating to Estates Maintenance, the Estates Contract Supervisor, or Technical Service Manager/Facility Manager as necessary, reports of defects, failure or issues with regards to pressure systems.

### **3.5.2 Duties of Principal Investigators / Supervisors**

Principal Investigators (PIs) and Supervisors of staff and students using pressure systems are responsible for:

- providing all required information, instruction, training and supervision to users, in relation to the correct selection, operation and user checks of any pressure system under their control;
- maintaining records of all pressure system training and ensuring only those trained are authorised to use the system;
- ensuring that work involving pressure systems is risk assessed and that the identified control measures adequately cover the risk of uncontrolled release of pressure and the pressure system contents;

- ensuring pressure systems are used in accordance with the user manual/operating instructions and within design parameters;
- monitoring the operation of pressure systems to ensure they are being checked and operated by users in accordance with instructions, providing a 'first line of defence' for assurance, as illustrated in Appendix B;
- ensuring that, for new pressure systems not acquired or installed through Estates Capital Programmes, the Technical Lead and H&S Lead (or other competent persons, as appropriate) are consulted before purchase and that sufficient information is supplied to determine the correct specification of pressure system (see also Chapter 4.1, System Specification, Design and Procurement);
- ensuring that the Technical Lead and H&S Lead (or other competent persons, as appropriate) are consulted regarding any proposed modifications to existing pressure systems before any changes are made;
- ensuring that all pressure systems under their control are asset tagged and added to the register of items to be inspected, including the provision of the related asset information and documentation, by the completion of the Statutory Inspection Report Form (Ref. 10);
- cooperating with arrangements for maintenance, examination and remedial works and making available any pressure systems requiring such;
- providing information about the type of work and risks from the pressure system or its contents to Estates upon request, when designing new systems or prior to Estates maintenance staff, contractors or engineering inspectors working on the pressure system;
- ensuring that any pressure system is taken out of use immediately following notification of an examination failure, or notification of a fault/condition that could give rise to danger;
- seeking further information and advice as necessary, from the Technical Lead, H&S Lead, competent personnel or consultants, before working with pressure systems.

### 3.5.2.1 Duties of Pressure System Users

Staff and students using pressure systems are responsible for:

- ensuring that the use of pressure systems equipment is only undertaken following the provision of adequate information, instruction and training;
- ensuring that the risk assessment includes the risk of uncontrolled release of pressure and the pressure system contents, and that the identified control measures are implemented;
- maintaining a safe working environment whilst working with pressure systems;
- undertaking any user checks of the pressure system that may be required;
- reporting any defect associated with their pressure systems, without delay, to their PI/supervisor initially, ensuring that the fault is logged via the Estates Service Desk where appropriate (see Appendix E);
- following the operating procedures, including any local emergency procedures in the event of a failure of the pressure system;
- using the pressure system only for its intended purpose and within design parameters;
- leaving the pressure system in a safe condition during closure periods.

Further information for users is available on the University's Health and Safety web pages (Ref. 1).

## 4 Requirements for Pressure Systems

There are significant requirements surrounding pressure systems and pressure equipment to ensure safety and compliance. This section details the specific requirements that shall be met.

### 4.1 System Specification, Design and Procurement

The specification of pressure systems, including those outside of capital projects (e.g. portable systems, or those which are contained in a single piece of apparatus) shall follow the guidance set out in PSSR 2000 Approved Code of Practice (Ref. 4). This includes the need for departments to identify:

- What part of the system has 'relevant fluid' that is under pressure and falls under the remit of PSSR 2000 (Ref. 3), or indeed needs to comply with any other regulations;
- Properties of the 'relevant fluid';
- Conditions that affect the pressure in the system under normal and abnormal conditions;
- The design parameters required for the particular application to ensure its suitability, which should all form part of a risk assessment, taking into account:
  - User competency;
  - Construction (materials, including any connections);
  - Protection against failure (protective devices);
  - Its location;
  - The environment it will operate in.

Commercially available products will require less scrutiny, (providing they are CE or UKCA marked) for example, than larger/bespoke systems.

Where a pressure system requires any element of design, prior to installation, it shall be specified in relation to the risk assessment for the specific application for which it is intended to be used.

When developing the specification, departments should seek advice from the H&S Lead, Technical Lead, or other competent person to help in the selection of the right type of pressure system.

When procuring new pressure equipment, the supplier shall be required to provide operating instructions for the equipment including how to use, check and maintain it, and, where relevant, for the control of the whole system including emergencies.

Going forward, the University recommends a leased solution as the preferred procurement option for installed systems, where the supplier assumes responsibility in writing (known as a 'Schedule 2 letter') for compliance with those regulations which deal with WSE, operation, maintenance and record keeping.

When hiring or leasing pressure equipment, the hiring/leasing department must still ensure the suitability of the equipment and that it is safe to use. Arrangements must be put in place to ensure that the pressure equipment is maintained and examined at the appropriate intervals and there is a mechanism in place for defects to be reported and remedied. Where hired or leased pressure equipment is connected to University pipework or systems, the demarcation of responsibilities must be clearly established.

Most new pressure equipment is subject to conformity assessment and must be appropriately CE or UKCA (UK Conformity Assessed) marked and accompanied by the Declaration of Conformity (DoC). The procuring department must ensure that new equipment conforms to the appropriate standards and regulations.

### 4.2 Pre-Use Checks

PUWER (Ref. 7) requires that work equipment must be inspected if there is any significant risk (for example, of major injury) to operators and others from the equipment's installation or use. A pre-use check is a basic type of inspection carried out by the user before the equipment is operated. The aim of such checks is to pick

up faults due to wear and tear or malfunction of safety-related equipment between more extensive inspections or examinations.

Most propriety pressure systems will come with a user manual highlighting the appropriate pre-use checks and ongoing maintenance requirements.

A trained operator or other person carrying out the checks should be able to identify damage or excessive wear, structural defects, leaks, and other obvious faults which could affect the safe operation of the pressure equipment. If any defects are found, the user should report the defect to their supervisor (or if competent to do so, take action to rectify it).

### 4.3 Maintenance

Where maintenance requirements exist (equipment inspection, testing of safety valves, replacement of fluids or seals, etc.), these shall be undertaken in line with the manufacturer's prescribed intervals. If no such documentation exists, a risk-based approach will be undertaken to define the periodicity of such works, informed by the Technical Lead or other competent person, as necessary.

Maintenance may require isolation of a part or system. Where this is the case, adequate arrangements shall be made with the department to avoid any risk of uncontrolled release of pressure or the pressure system contents (e.g., locking off, venting).

Maintenance tasks shall only be undertaken by personnel or contractors who demonstrate the required level of competence to undertake those tasks in a safe manner and to the required standard of workmanship.

Risk assessments for maintenance tasks shall be reviewed in cooperation with departmental staff, to ensure that information relating to the pressure system contents is adequately incorporated, in addition to the hazards and controls arising from the task itself and the work environment.

Departments must allow appropriate access when required to carry out maintenance activities; this should be facilitated through the Departmental Point of Contact for Pressure Systems, having received prior notification, whenever possible.

Where departments carry out or organise maintenance tasks, a record must be kept locally and a copy made available, as required.

### 4.4 Written Scheme of Examination (WSE) and Examination of Pressure Systems

Under PSSR 2000 (Ref. 3), you are required to demonstrate that you know the safe operating limits of your pressure systems, and that the systems are safe under those conditions.

A WSE is a document containing information about selected items of plant or equipment which form a pressure system, operate under pressure and contain a 'relevant fluid'. An item of plant from the pressure system should be included in a WSE if its failure could unintentionally release pressure from the system and the resulting release of stored energy could cause injury. The WSE must specify the nature and frequency of examinations and include any special measures that may be needed to prepare a system for a safe examination.

Items of plant may need to be included in the written scheme of examination if the answer to any of these questions is 'Yes':

- Do the manufacturers of the plant or equipment forming the pressure system give guidance, instruction and the precautions to take for safe operation of the system?
- Could failure of any part of the pressure system cause someone in the vicinity to be injured by the release of pressure, fragments, or steam?
- Does the pressure system contain any protective devices?

Not all pressure systems require a WSE, and there are also some exceptions, including pressurised apparatus that is the subject of a research experiment, certain medical devices, and very small systems (see ACOP L122,

Ref. 4 for more details). However, they must still conform to other parts of the regulations, such as the need to maintain and inspect.

If a WSE is required, departments must ensure that it is in place before the system is operated. Departments also need to ensure that the pressure system is examined by a competent person in accordance with the WSE and updated after modification or repair to the system.

Further guidance on WSE is provided by the Health and Safety Executive in the leaflet 'Written schemes of examination: Pressure Systems Safety Regulations 2000', INDG178 (Ref. 6).

Insurance Services department and Estates department contract with third-party organisations who produce WSE and carry out the examinations for most pressure systems owned by the University. However, for some specialist pressure apparatus, the framework contractor may not be able to provide the requisite support and in these cases, it is the responsibility of the using department to ensure the equipment is examined at the appropriate intervals.

For pressure equipment that is hired or leased, the using department must ensure that the necessary examinations are completed. Such examinations should be arranged by the user or hire/leasing company through agreement.

Departments must register all pressure systems under their control for examination, by completing the Statutory Inspection Report Form (Ref. 10).

Departments must allow appropriate access, address other hazards, and complete any preparatory work, as required to ensure that the examination can be undertaken safely; this should be facilitated through the Departmental Point of Contact for Pressure Systems, having received prior notification, whenever possible.

The competent person undertaking the examination shall provide a report of the examination (including any remedial actions required) to the Contract Supervisor for Pressure Systems, either directly or through electronic means. They may also update the information on the asset (e.g., a 'pass' label or similar indicator) to indicate the examination result.

Any pressure equipment that is found to be defective during examination and poses (or could pose) a risk of injury to persons must be clearly identified and the local Departmental Point of Contact and any users in the area informed, prior to the competent person leaving that area. Such repairs as required for continued safe operation must be undertaken before the equipment is brought back into use.

Where the latest date for the next examination has passed, the pressure system shall be taken out of use until satisfactory examination has been achieved.

Appendix F provides an overview of the examination and certification process to be used at the University.

#### **4.5 Documentation and Record Keeping**

New pressure equipment should be accompanied by instructions in English and, where appropriate, a Declaration of Conformity (DoC).

Documentary requirements may include relevant commissioning and initial examination/test results, system drawings, specifications, manufacturer's literature, and component data.

Where it is not possible to obtain these documents from the manufacturer/installer of a system, the relevant information shall be determined and recorded, by a competent person, and be subject to review by the Technical Lead.

Records of examination and maintenance must be stored securely and made available to those stakeholders requiring access to them. These records should be retained in accordance with the legislation:

- A WSE must be maintained for the lifetime of the system.



- The last examination report produced by the competent person under the WSE and any other report that could assist in assessing the safety of the system, particularly in relation to repairs and modifications.
- Any notification of imminent danger or postponement of examinations should also be retained until the necessary actions have been carried out.

If a pressure system is sold or otherwise changes hands, these records must be passed to the new owner as soon as possible. In addition, any design details and the schedule of examinations should also be passed to the new owner.

Asset information, as provided by departments to Estates, will be held by the Head of Estates Information and Systems (see Chapter 3.2.5) and made available within QuEMIS<sup>5</sup> or an alternative suitable data repository.

Where examination is carried out by an external contractor, those records must be made accessible to the University.

Records of all staff and student training on pressure equipment and pressure systems shall be recorded and retained in accordance with the University Records Retention Schedule (Ref. 11).

#### **4.6 Decommissioning**

Where a pressure system is to be removed, consideration must be given to its safe removal, disconnection from any connected services, and disposal.

Any proposed decommissioning of fixed pressure systems (those which attach to or form part of the building infrastructure) must be advised to Estates.

Decommissioning of pressure systems may be undertaken internally, by suitably competent contractor, or a combination of both. A suitable risk assessment must be undertaken for the decommissioning and disposal work, and information about the hazards posed by other work in the area must be made available by the department to those undertaking the decommissioning work.

Departments must ensure they follow relevant University financial procedures concerning disposal of assets and the update of financial asset registers and inventory lists.

Following decommissioning and disposal, Departments must complete the Statutory Inspection Report Form (Ref. 10) in order that the pressure system equipment is removed from the examination register.

## **5 Operational Use**

The use of any pressure system, including pressure vessels, must comply with PSSR 2000 (Ref. 3). Even where there are specific exemptions, the principles have to be complied with as far as it is reasonable to do so in the circumstances.

A suitable and sufficient risk assessment must be in place, prior to any work involving pressure systems and must be enacted by the department. The risk assessment will need to include the risk of uncontrolled release of pressure and the pressure system contents, including where relevant, the scalding effects of steam (at any pressure). Where substances contained in the pressure system are considered to be hazardous to health, explosive or flammable, a COSHH (ref. 8) and/or DSEAR (ref. 9) risk assessment must also be completed by the person responsible for its use.

The department must ensure that pressure systems are operated only by persons trained to do so, and in line with the requirements and limitations of that system.

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<sup>5</sup> 'QuEMIS' is the University of Warwick's online asset and maintenance recording system. The system generates planned and reactive maintenance tasks.

Use of pressure systems apparatus should only commence following any required user checks, any applicable examination and an assessment that the system is operating correctly by the department.

Pressure systems should only be used for their intended purpose.

As far as reasonably practical, pressure systems must be left in a safe condition during closure periods.

Where there is a failure of the pressure system, an adverse incident, a significant change in the process, or other factors that could affect safe operation, the use of that system shall cease, the system should be suitably isolated, and a notice displayed to inform potential users. The system shall not be brought back into use until any relevant investigation, maintenance or examination has been completed and the system declared suitable.

Appendix E provides an overview of the user checks and fault reporting process to be used at the University.

## 6 References

1. University of Warwick Pressure Systems Policy and associated instructions and guidance:  
<https://warwick.ac.uk/services/healthsafetywellbeing/guidance/pressuresystems>
2. Pressure Equipment Regulations 1999:  
<https://www.legislation.gov.uk/uksi/1999/2001/contents/made>
3. Pressure Systems Safety Regulations 2000 (SI 2000/128):  
<https://www.legislation.gov.uk/uksi/2000/128/contents/made>
4. Pressure Systems Safety Regulations 2000. Approved Code of Practice (ACOP L122):  
<https://www.hse.gov.uk/pubns/books/L122.htm>
5. Pressure systems, a brief guide to safety. HSE, INDG261:  
<https://www.hse.gov.uk/pubns/indg261.htm>
6. Written schemes of examination: Pressure Systems Safety Regulations 2000. HSE, INDG178:  
<https://www.hse.gov.uk/pubns/indg178.htm>
7. Provision and Use of Work Equipment Regulations 1998 (PUWER):  
<https://www.legislation.gov.uk/uksi/1998/2306/contents/made>
8. The Control of Substances Hazardous to Health Regulations 2002 (as amended):  
<https://www.legislation.gov.uk/uksi/2002/2677/contents/made>
9. The Dangerous Substances and Explosive Atmospheres Regulations 2002 (as amended):  
<https://www.legislation.gov.uk/uksi/2002/2776/contents/made>
10. Statutory Inspection Report Form:  
[https://warwick.ac.uk/services/healthsafetywellbeing/guidance/statest/crimson/plant\\_equipment\\_statutory\\_testing/](https://warwick.ac.uk/services/healthsafetywellbeing/guidance/statest/crimson/plant_equipment_statutory_testing/)
11. University Records Retention Schedule:  
<https://warwick.ac.uk/services/sim/guidance/recordsmanagement>
12. University Contractor Management Policy and guidance:  
<https://warwick.ac.uk/services/healthsafetywellbeing/guidance/contractors>

## 7 Document Control

Document Control			
Version Number	Date issued	Author	Update information
v1	05/05/2021	John Brandist	Initial version of document
v1.1	15/07/2021	John Brandist	Subject Matter Expert role renamed as Health and Safety Lead. New role and duties of Estates Technical Lead for Pressure Systems added. Other minor edits to address comments received.
v1.2	05/05/2022	John Brandist	Additions concerning bulk storage, lease/licence arrangements and decommissioning. References to COSHH and DSEAR added. Review periodicity set to 3 years as per SI&C Board decision #169.
Owner: John Phillips, Director of Health & Safety			Authorised By: John Phillips, Director of Health & Safety
Source Location: M:\SF\OCH 2006\Management System\02 Develop and Implement Controls\04 SOPs and COPs(B5)\09 Pressure Systems			Approval Date: 20/05/2022
Published Location: <a href="#">Web Page</a>			Review date: May 2025

## Appendix A – Responsibility Grid for Pressure Systems

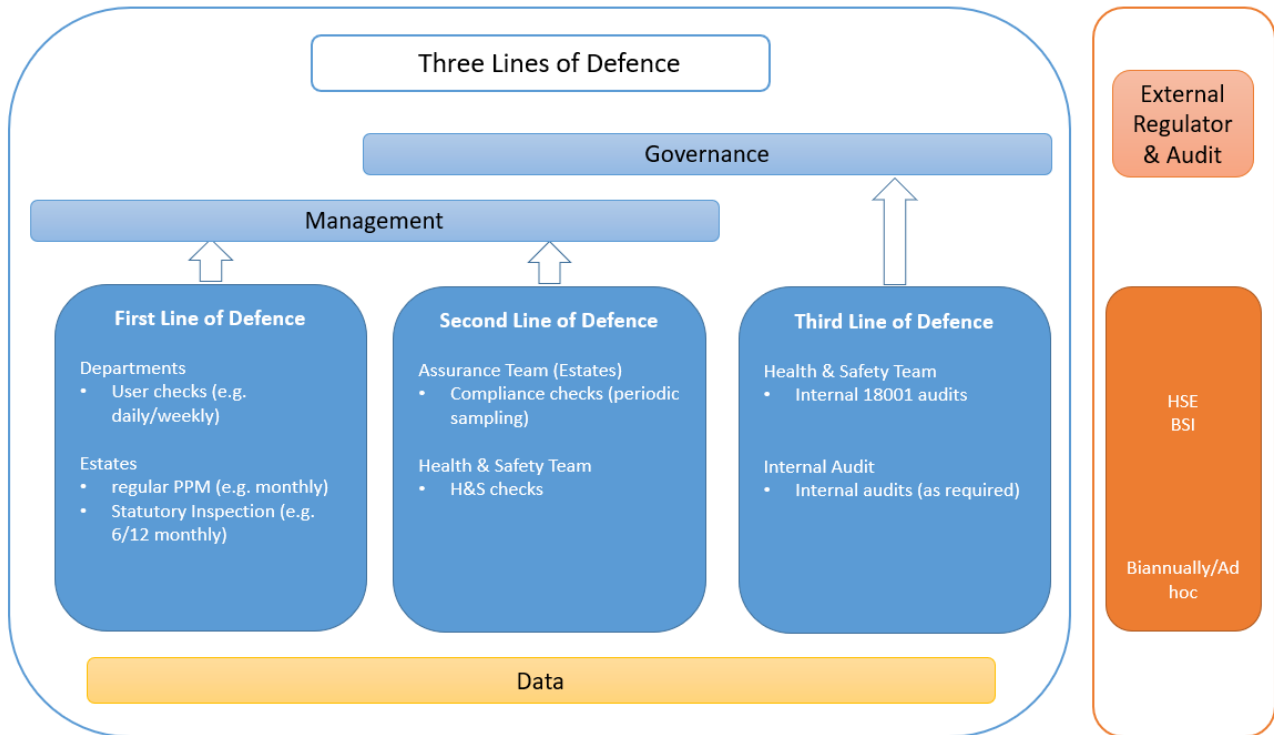
Roles and Responsibilities - Statutory Inspections & Compliance (Future State)

Prog Board Area	Statutory Area	Corporate Approach	ACCOUNTABLE	RESPONSIBLE			TASK	SUPPORT			INFORM	ASSURANCE		
			Accountable	Responsible	Delegated Responsibility	Delegated Responsibility	As Detailed in the CoP	Department Point of Contact	Estates Technical Lead	Health and Safety Lead	Inform	First Line	Second Line	Third Line
Pressure Systems and Regulators	Pressure Systems	Yes	Group Finance Director	Director of Estates	Operations Director Estates	Head of Maintenance	Detailed in the CoP	Technical Services / Facilities Management	Maintenance Manager, Mechanical Services	Senior Adviser, Health and Safety Services	Technical Services Manager Users	Supervisor (user checks) Technical Services Manager (planned and remedial maintenance)	Estates Assurance Health & Safety Officers	Health and Safety Services Internal Audit (Governance)
	Regulators (Academic)	Yes	Group Finance Director	Director of Estates	Operations Director Estates	Head of Maintenance	Detailed in the CoP	Technical Services	Maintenance Manager, Mechanical Services	Senior Adviser, Health and Safety Services	Technical Services Manager Users	PI/Supervisor (user checks) Technical Services Manager (planned and remedial maintenance)	Estates Assurance Departmental Assurance/Compliance Health & Safety Officers	Health and Safety Services Internal Audit (Governance)
	Portable Pressure Systems (Academic)	Yes	Group Finance Director	Director of Estates	Operations Director Estates	Head of Maintenance	Detailed in the CoP	Technical Services	Maintenance Manager, Mechanical Services	Senior Adviser, Health and Safety Services	Technical Services Manager Users	PI/Supervisor (user checks) Technical Services Manager (planned and remedial maintenance)	Estates Assurance Departmental Assurance/Compliance Health & Safety Officers	Health and Safety Services Internal Audit (Governance)
Bulk Storage	Bulk Storage	Yes	Group Finance Director	Director of Estates	Operations Director Estates	Head of Maintenance	To be detailed in the CoP	Technical Services / Facilities Management / Building Manager	Maintenance Manager, Mechanical Services	Senior Adviser, Health and Safety Services	Technical Services / Facilities Management / Building Management Users	PI/Supervisor (user checks)	Estates Assurance Health & Safety Officers	Health and Safety Services Internal Audit (Governance)

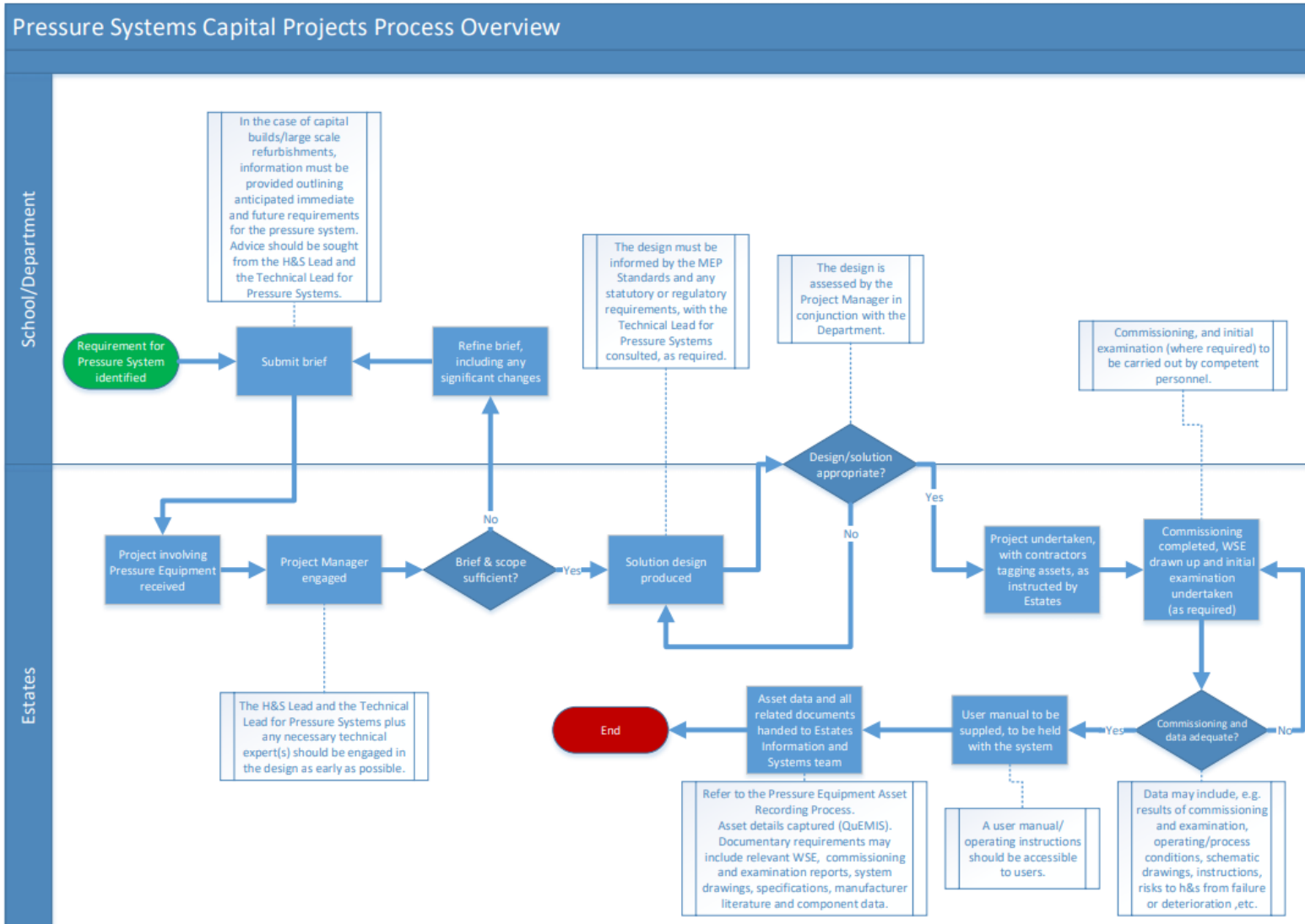
**Corporate Approach** where arrangements for statutory inspection and compliance are centrally managed by Estates.

- R = Responsible** who is in charge of recommending what work is done and making sure it happens.
- A = Accountable** who has final decision power on the work.
- T = Task** who actually does the work (or arranges for it to be done).
- S = Support** who is involved to provide support to the work.
- I = Informed** who is informed that the work has been done (or will be started).
- A = Assurance** who is checking that the work is done and procedures are followed.

## Appendix B – Assurance: Three Lines of Defence

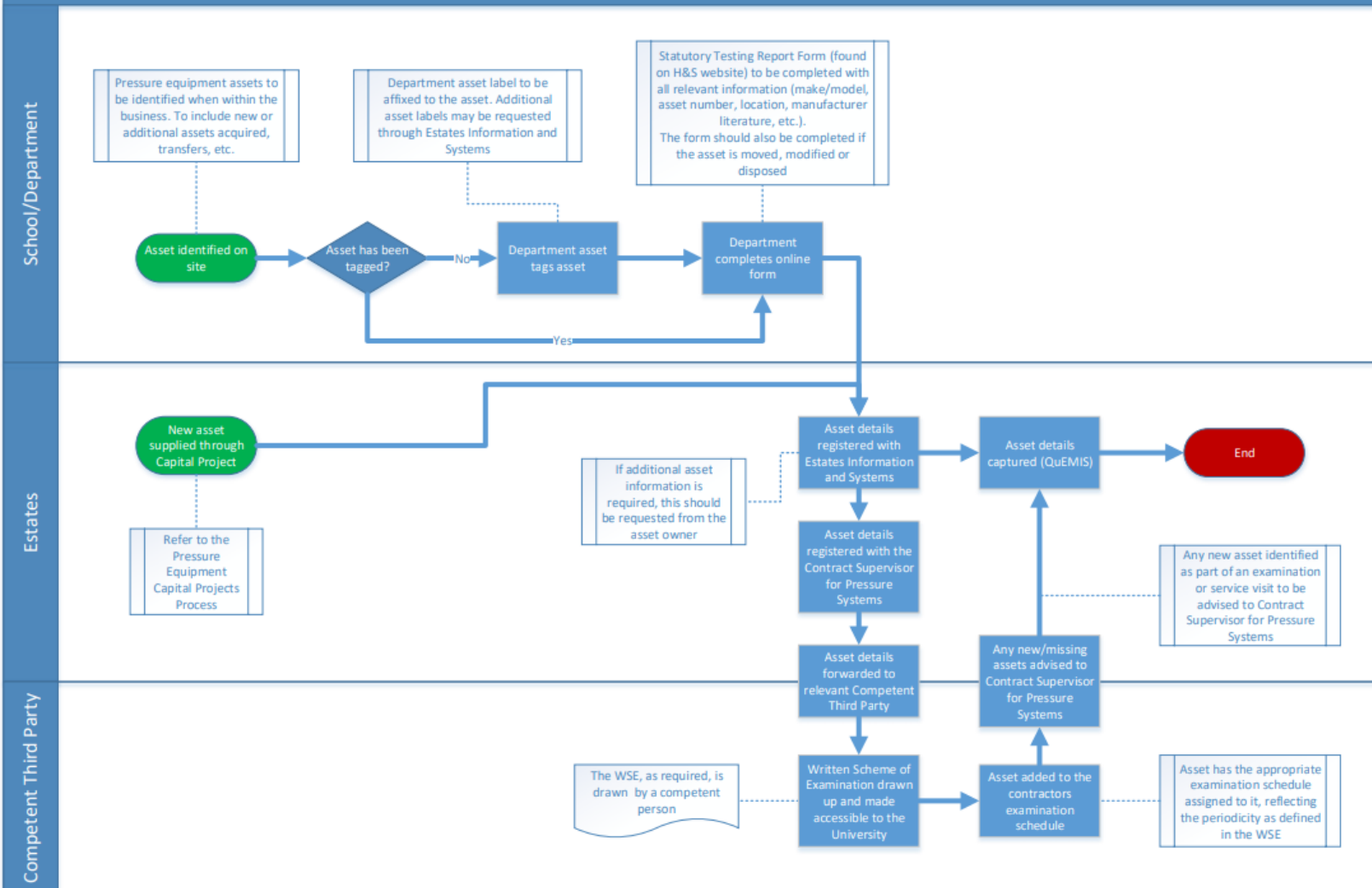


## Appendix C – Pressure Systems Capital Projects Process Overview



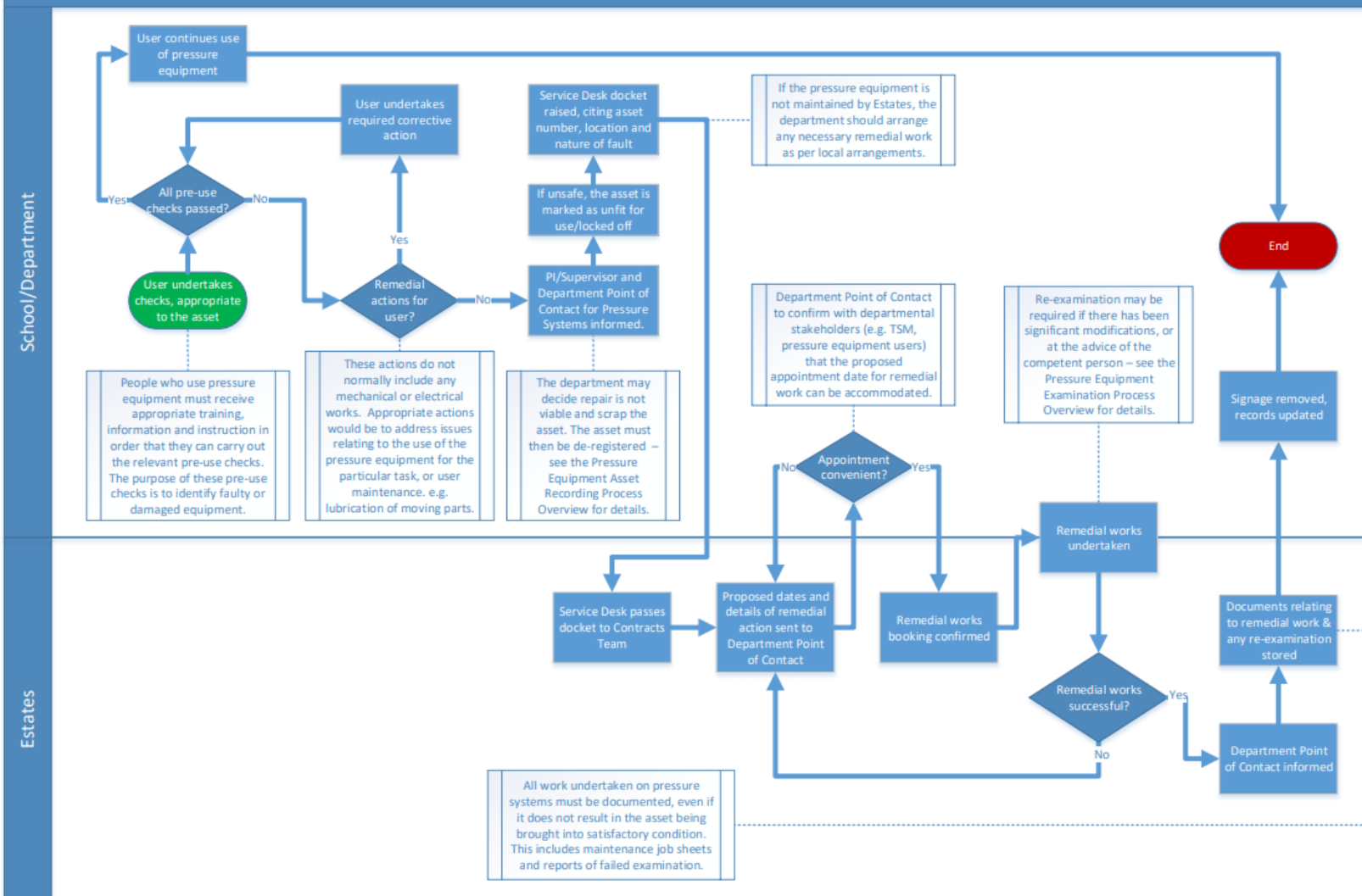
## Appendix D – Pressure Equipment Asset Recording Process Overview

### Pressure Equipment Asset Recording – Process Overview



## Appendix E – Pressure Equipment User Checks and Fault Reporting Process Overview

### Pressure Equipment User Checks & Fault Reporting





## Appendix F – Pressure Equipment Examination and Certification Process Overview (University Owned Systems)

